

# Домашняя работа №1 по дисциплине «МОВС: Компьютерное зрение»

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Дата:

**26 января 2025**

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😊 Первый раз в жизни делаю посадку на юпитер 😊

## ANSI коды для цветов текста

```
In [1]: RED = "\033[31m"
GREEN = "\033[32m"
YELLOW = "\033[33m"
BLUE = "\033[34m"
RESET = "\033[0m" # сброс цветов до стандартных
```

## Шаблоны markdown

```
# Это комментарий в коде
def greet(name):
    print(f"Hello, {name}!")
```

---

code

## Установка библиотек

```
In [2]: # !pip install torch==1.12.1+cu116 torchvision==0.13.1+cu116 --index-url https://download.pytorch.org/whl/cu116
# !pip install tensorboard==2.10.1 tensorflow==2.10.0
# !pip install pydantic==2.10.3
# !pip install tqdm==4.66.2
# !pip install scikit-learn==1.5.1
# !pip install scipy==1.13.1
# !pip install seaborn==0.13.2
# !pip install rich==13.7.1
```

```
# !pip install requests==2.32.3
# !pip install pillow==10.4.0
# !pip install pandas==2.2.2
# !pip install matplotlib==3.9.2
# !pip install duckdb==1.1.0
# !pip install annotated-types==0.7.0
```

## Подготовка к написанию кода

### Импорт библиотек

```
In [3]: print(f"\033[93m{YELLOW}"+60*"-"+f"\033[0m{RESET}")  
print(f"\033[93mБиблиотеки: \n")  
  
# Дополнительные библиотеки  
import platform # Узнать версию пайтона ;)  
import os  
import logging  
import time  
import sys  
import random  
import re  
import shutil  
from tqdm import tqdm  
from functools import wraps  
from typing import Any, Tuple, Union, Optional, List, Type, Callable, Dict  
from collections import Counter  
import zipfile  
from dataclasses import dataclass  
  
# Основные библиотеки  
import IPython.display as ipd # Добавляет виджеты для ячеек юпитера  
from IPython import get_ipython  
import ipykernel  
print(f"\033[93mpython: {BLUE}{platform.python_version()}{RESET} ")  
import matplotlib # Для рисунков  
import matplotlib.pyplot as plt  
print(f"\033[93mmatplotlib: {BLUE}{matplotlib.__version__}{RESET}")  
import numpy as np # Для работы с массивами  
print(f"\033[93mnumpy: {BLUE}{np.__version__}{RESET}")  
import pandas as pd # Работа с таблицами  
print(f"\033[93mpandas: {BLUE}{pd.__version__}{RESET}")  
import sklearn # Много полезного для ML  
from sklearn.metrics import precision_score, recall_score, f1_score, accuracy_score  
print(f"\033[93msklearn: {BLUE}{sklearn.__version__}{RESET}")  
import scipy  
print(f"\033[93mscipy: {BLUE}{scipy.__version__}{RESET}")  
import pydantic # Для валидации данных  
from pydantic import (BaseModel, Field, StrictStr, condecimal, StrictInt, StrictBool,  
                      FilePath, DirectoryPath, ValidationError, root_validator, Con  
print(f"\033[93mpydantic: {BLUE}{pydantic.__version__}{RESET}")  
import fastapi
```

```

from fastapi import HTTPException, status
print(f"fastapi: {BLUE}{fastapi.__version__}{RESET}")
import torch
import torch.nn as nn
import torch.optim as optim
import torch.nn.functional as F
from torch.optim.lr_scheduler import ReduceLROnPlateau
from torch.utils.data import DataLoader, Subset, WeightedRandomSampler
print(f"torch: {BLUE}{torch.__version__}{RESET}")
import torchvision
from torchvision import datasets
import torchvision.transforms as transforms
from torchvision.datasets import ImageFolder
import torchvision.models as models
print(f"torchvision: {BLUE}{torchvision.__version__}{RESET}")
import requests
print(f"requests: {BLUE}{requests.__version__}{RESET}")
import PIL
from PIL import Image
print(f"Pillow: {BLUE}{PIL.__version__}{RESET}")

from rich.theme import Theme
from rich.logging import RichHandler
from rich.console import Console
from rich.pretty import install as pretty_install
from rich.traceback import install as traceback_install

print(YELLOW)+"*"*60+f"{RESET}"

```

Библиотеки:

```

python: 3.9.16
matplotlib: 3.9.2
numpy: 1.26.4
pandas: 2.2.2
sklearn: 1.5.1
scipy: 1.13.1
pydantic: 2.10.3
fastapi: 0.115.7

```

```
C:\Users\NightMare\PycharmProjects\CVtools\venv\lib\site-packages\tqdm\auto.py:21: T
qdmWarning: IPython not found. Please update jupyter and ipywidgets. See https://i
pywidgets.readthedocs.io/en/stable/user_install.html
    from .autonotebook import tqdm as notebook_tqdm

```

```

torch: 1.12.1+cu116
torchvision: 0.13.1+cu116
requests: 2.32.3
Pillow: 10.4.0

```

## Дополнительные настройки

```
In [4]: import warnings
warnings.filterwarnings("ignore")
```

```
import logging
# Отключение логирования для cmdstanpy
logging.getLogger('cmdstanpy').setLevel(logging.ERROR)
# Полезна при разработке собственных библиотек, юпитер будет переимпортировать модуль
%load_ext autoreload
%autoreload 1
```

## Кастомный setup\_logging

```
In [5]: log = None

def setup_logging(clean=False, debug=False):
    global log

    if log is not None:
        return log

    try:
        if clean and os.path.isfile('setup.log'):
            os.remove('setup.log')
        time.sleep(0.1) # prevent race condition
    except:
        pass

    if sys.version_info >= (3, 9):
        logging.basicConfig(level=logging.DEBUG, format='%(asctime)s | %(levelname)s',
                            filename='setup.log', filemode='a', encoding='utf-8', f
    else:
        logging.basicConfig(level=logging.DEBUG, format='%(asctime)s | %(levelname)s',
                            filename='setup.log', filemode='a', force=True)

    console = Console(log_time=True, log_time_format='%H:%M:%S-%f', theme=Theme({
        "traceback.border": "black",
        "traceback.border.syntax_error": "black",
        "inspect.value.border": "black",
    }))
    pretty_install(console=console)
    traceback_install(console=console, extra_lines=1, width=console.width, word_wra
                      suppress=[])
    rh = RichHandler(show_time=True, omit_repeated_times=False, show_level=True, sh
                     rich_tracebacks=True, log_time_format='%H:%M:%S-%f',
                     level=logging.DEBUG if debug else logging.INFO, console=consol
    rh.set_name(logging.DEBUG if debug else logging.INFO)
    log = logging.getLogger("sd")
    log.addHandler(rh)

    return log
```

```
In [6]: log = setup_logging()
```

## Валидация входящих данных для каждого класса

## validate\_with\_pydantic

```
In [7]: def validate_with_pydantic(model_cls):
    """
    Декоратор для валидации данных с использованием Pydantic-модели.
    """

    def decorator(func):
        @wraps(func)
        def wrapper(*args, **kwargs):
            # Проверяем данные в аргументах функции
            try:
                data = kwargs.get("entry", args[0] if args else None)
                if not data:
                    raise HTTPException(status_code=status.HTTP_400_BAD_REQUEST,
                                         detail="No data provided for validation.")
                # Валидация данных
                if isinstance(data, BaseModel):
                    data = data.dict(by_alias=True)
                validated_data = model_cls(**data)
                # Передаем валидированные данные дальше
                kwargs["entry"] = validated_data
            return func(*args, **kwargs)
        except ValidationError as ve:
            log.exception("Validation failed", exc_info=ve)
            raise HTTPException(status_code=status.HTTP_400_BAD_REQUEST,
                                detail="Invalid data for Pydantic model.") from ve
    return wrapper

    return decorator
```

## auto\_generate\_docstring

```
In [8]: def auto_generate_docstring(cls: Type[BaseModel]) -> Type[BaseModel]:
    """
    Декоратор для автоматического добавления docstring в классы Pydantic.
    """

    def generate_docstring(model: Type[BaseModel]) -> str:
        """
        Генерация строки документации из описания полей модели Pydantic.
        """

        docstring = []
        for field_name, field_info in model.__fields__.items():
            field_details = f"Field '{field_name}':\n"
            if field_info.description: # Получение описания
                field_details += f"  Description: {field_info.description}\n"
            if field_info.examples: # Получение примеров
                field_details += f"  Examples: {field_info.examples}\n"
            docstring.append(field_details)
        return "\n".join(docstring)
```

```

# Добавляем описание к существующему docstring
cls.__doc__ = (cls.__doc__ or "") + "\n\n" + generate_docstring(cls)
return cls

```

## EntryGraduateModel

In [103...]

```

@auto_generate_docstring
class EntryGraduateModel(BaseModel):
    """
    Класс для валидации входных данных EntryGraduateModel
    """

    model_config = ConfigDict(arbitrary_types_allowed=True)
    Prefix: Optional[StrictStr] = Field("", alias="prefix",
                                         examples=["exp1"],
                                         description="Предфикс к названию модели")
    Models: list[str] = Field(..., alias="models",
                             examples=[["efficientnet_b0", "efficientnet_b1"]],
                             description="Список моделей для обучения")
    NameOptimizers: list[str] = Field(..., alias="name_optimizers",
                                       examples=[["Adam"]],
                                       description="Лист с названиями оптимизаторов")
    UseImageNetWeights: Optional[bool] = Field(False, alias="is_use_imagenet_weights",
                                                examples=[True],
                                                description="Использовать предобучен")
    IsGray: Optional[bool] = Field(False, alias="is_gray",
                                   examples=[False],
                                   description="RGB в GrayScale?")
    NameLoss: Optional[StrictStr] = Field("CrossEntropyLoss", alias="name_loss",
                                          examples=["name_loss"],
                                          description="Название функции потерь из т")
    SizeImg: Optional[tuple] = Field((64, 64), alias="size_img",
                                      examples=[(224, 224)],
                                      description="Размер изображения для обучения")
    Ratio: Optional[tuple] = Field((60, 20, 20), alias="ratio",
                                   examples=[(60, 20, 20)],
                                   description="Доля тренировочной, валидационной и")
    PathData: Optional[StrictStr] = Field("./data", alias="path_to_data",
                                         examples=[ "./data"],
                                         description="Путь к директории с данными.")
    PathWeights: Optional[StrictStr] = Field("./weights", alias="path_to_weights",
                                              examples=[ "./weights"],
                                              description="Если сохраним веса, то к")
    PathMetricsTrain: Optional[StrictStr] = Field("./metrics_train", alias="path_to_metrics_train",
                                                 examples=[ "./metrics_train"], description="Если сохраним веса, то к")

```

```

        description="Куда сохраняем тренировочные метрики"
PathMetricsTest: Optional[StrictStr] = Field("./metrics_test",
                                            alias="path_to_metrics_test",
                                            examples=[ "./metrics_test" ],
                                            description="Куда сохраняем тестовые метрики")
PathSavePlots: Optional[StrictStr] = Field("./plot",
                                            alias="path_to_save_plots",
                                            examples=[ "./plot" ],
                                            description="Куда сохраняем графики")
UseDevice: Optional[StrictStr] = Field(None,
                                         alias="use_device",
                                         examples=[ "cuda" ],
                                         description="Какое устройство использовать")
StartLerningRate: Optional[condecimal(ge=0.00000001, le=0.01, decimal_places=8)]

BatchSize: Optional[StrictInt] = Field(1,
                                       alias="batch_size",
                                       examples=[10],
                                       description="Размер пакета при обучении")
NumWorkers: Optional[StrictInt] = Field(0,
                                         alias="num_workers",
                                         examples=[0],
                                         description="Кол. используемых потоков")
PinMemory: Optional[StrictBool] = Field(False,
                                         alias="pin_memory",
                                         examples=[False],
                                         description="Если True ускоряет загрузку")
NumEpochs: Optional[StrictInt] = Field(3,
                                       alias="num_epochs",
                                       examples=[20],
                                       description="Количество эпох обучения для каждого цикла")
Seed: Optional[StrictInt] = Field(17,
                                 alias="seed",
                                 examples=[17],
                                 description="Сажает зерно")
ClassPercentages: Optional[dict[str, int]] = Field(None,
                                                   alias="class_percentages",
                                                   examples=[{"cats": 0.2, "dogs": 0.8}],
                                                   description="Доля используемых классов")
UseClassWeights: Optional[bool] = Field(False,
                                         alias="is_use_class_weights",
                                         examples=[True],
                                         description="Учитывать ли веса классов")
ResamplingMethod: Optional[str] = Field(None,
                                         alias="resampling_method",
                                         examples=[ "undersampling" ],
                                         description="Метод resampling: oversampling или undersampling")

```

## EntryInferenceModel

```
In [148]: @auto_generate_docstring
class EntryInferenceModel(BaseModel):
    """
```

```

Класс для валидации входных данных EntryInferenceModel
"""
model_config = ConfigDict(arbitrary_types_allowed=True)
Prefix: Optional[StrictStr] = Field("",
                                    alias="prefix",
                                    examples=["exp1"],
                                    description="Предфикс к названию модели")
NameModel: StrictStr = Field(...,
                            alias="name_model",
                            examples=["efficientnet_b0_2024_10_02"),
                            description="Название файла .pt")
NumClasses: Optional[StrictInt] = Field(2,
                                       alias="num_classes",
                                       examples=[2],
                                       description="Количество классов")
ImageList: list[StrictStr] = Field(...,
                                    alias="image_path_list",
                                    examples=[["./images/image.jpg"]],
                                    description="Список путей к изображениям")
SizeImg: Optional[tuple] = Field((64, 64),
                                 alias="size_img",
                                 examples=[(224, 224)],
                                 description="Размер изображения для инференса")
PathWeights: Optional[StrictStr] = Field("./weights",
                                         alias="path_to_weights",
                                         examples=[ "./weights"],
                                         description="Путь к папке, где хранятся веса")
Plots: Optional[StrictBool] = Field(False,
                                     alias="plots",
                                     examples=[True],
                                     description="Строить рисунки? Да/Нет")
SavePlots: Optional[StrictBool] = Field(True,
                                         alias="save_plots",
                                         examples=[True],
                                         description="Сохранять рисунки? Да/Нет")
SavePathPlots: Optional[StrictStr] = Field("./result",
                                           alias="save_path_plots",
                                           examples=[ "./plot"],
                                           description="Если сохраним рисунки, то в何处")
UseDevice: Optional[StrictStr] = Field(None,
                                       alias="use_device",
                                       examples=[ "cuda"],
                                       description="Какое устройство использовать")
GroundTruth: Optional[list[int]] = Field(None,
                                         alias="ground_truth",
                                         examples=[[1, 0]],
                                         description="Список ground truth меток")
Classes: Optional[list[str]] = Field(None,
                                      alias="classes",
                                      examples=[["cat", "dog"]],
                                      description="Список названий классов")

```

## Загрузка и предобработка данных

# Загрузка и распаковка набор данных CatVsDogs

In [11]:

```
# Удаляем временные файлы и папки
os.remove(self.dataset_zip)
shutil.rmtree(extracted_dir) # Рекурсивно удаляем папку вместе с файлами

def download_and_prepare(self):
    self.download_dataset()
    self.extract_dataset()
    self.organize_dataset()
```

```
In [12]: # Скачивание и подготовка данных
dataset_url = "https://storage.googleapis.com/mledu-datasets/cats_and_dogs_filtered"
target_directory = "./"

downloader = CatsVsDogsDatasetDownloader(dataset_url, target_directory)
downloader.download_and_prepare()
```

```
Downloading CatsVsDogs Dataset: 100%|██████████| 65.4M/65.4M [00:03<00:00, 20.7MB/s]
```

Это отфильтрованный набор данных, он содержит меньше примеров, с крупным обучение долгое

## Формирование датасета для обучения TrainDirCreator

```
In [12]: class TrainDirCreator:

    def __init__(self,
                 image_dirs: list,
                 dest_dir: str,
                 ratio=(60, 20, 20)):
        self.dirs = image_dirs
        self.dest_dir = dest_dir
        self.ratio = ratio

        """
        ratio[0] = train
        ratio[1] = test
        ratio[2] = valid
        """

    def create_train_dirs(self):

        output_dir = self.dest_dir

        # Создание основной директории
        if not os.path.exists(output_dir):
            os.makedirs(output_dir)

        # Создание поддиректорий для train, test и validation
        for dataset_type in ["train_dataset", "test_dataset", "valid_dataset"]:
            dataset_path = os.path.join(output_dir, dataset_type)
            if not os.path.exists(dataset_path):
```

```

        os.makedirs(dataset_path)

    # Перемешивание и распределение изображений
    for image_dir in self.dirs:
        class_name = os.path.basename(image_dir)
        print(f"\nClass_name: {class_name}")
        image_list = os.listdir(image_dir)
        random.shuffle(image_list)
        total_images = len(image_list)
        train_count = int(total_images * self.ratio[0] / 100)
        print(f"Train_count: {train_count}")
        test_count = int(total_images * self.ratio[1] / 100)
        print(f"Test_count: {test_count}")
        valid_count = int(total_images * self.ratio[2] / 100)
        print(f"Valid_count: {valid_count}")

    # Перемешивание и копирование изображений в директории
    for i, image_name in enumerate(tqdm(image_list, desc="Shutil images", u
        src_path = os.path.join(image_dir, image_name)
        if i < train_count:
            dest_path = os.path.join(output_dir, "train_dataset", class_name)
        elif i < train_count + test_count:
            dest_path = os.path.join(output_dir, "test_dataset", class_name)
        else:
            dest_path = os.path.join(output_dir, "valid_dataset", class_name)

        # Создание директории для класса, если ее нет
        if not os.path.exists(os.path.dirname(dest_path)):
            os.makedirs(os.path.dirname(dest_path))

        shutil.copy(src_path, dest_path)

def get_path_to_dir(path_to_data):
    list_dir = os.listdir(path_to_data)
    test_dir = os.path.join(path_to_data, list_dir[0])
    train_dir = os.path.join(path_to_data, list_dir[1])
    valid_dir = os.path.join(path_to_data, list_dir[2])
    return train_dir, test_dir, valid_dir

```

## Обучение моделей

### FocalLoss

In [13]:

```

class FocalLoss(nn.Module):
    def __init__(self, alpha=None, gamma=2, reduction='mean'):
        super(FocalLoss, self).__init__()
        if isinstance(alpha, (list, torch.Tensor)):
            self.alpha = torch.tensor(alpha, dtype=torch.float32)
        else:
            self.alpha = alpha
        self.gamma = gamma

```

```

        self.reduction = reduction

    def forward(self, inputs, targets):
        ce_loss = F.cross_entropy(inputs, targets, reduction='none', weight=self.alpha)
        pt = torch.exp(-ce_loss)
        focal_loss = ((1 - pt) ** self.gamma) * ce_loss
        if self.reduction == 'mean':
            return focal_loss.mean()
        elif self.reduction == 'sum':
            return focal_loss.sum()
        else: # 'none'
            return focal_loss

```

In [14]: # Пример с двумя классами, вес для классов: [0.75, 0.25]  
#  $focal\_loss = FocalLoss(alpha=[0.75, 0.25], gamma=2, reduction='mean')$

## CustomSubset

In [196...]

```

class CustomSubset(Subset):
    def __init__(self, dataset, indices):
        super().__init__(dataset, indices)
        self.classes = dataset.classes # Сохраняем классы из оригинального датасета
        self.targets = [dataset.targets[i] for i in indices] # Сохраняем targets

```

## GraduateModel

In [197...]

```

class GraduateModel:

    def __init__(self,
                 prefix: str = "",
                 name_model: str = "efficientnet_b0",
                 path_to_data: str = "./data",
                 path_to_weights: str = "./weights",
                 path_to_metrics_train: str = "./metrics_train",
                 path_to_metrics_test: str = "./metrics_test",
                 is_use_imagenet_weights: bool = True,
                 name_optimizer: str = "Adam",
                 num_epochs: int = 3,
                 batch_size: int = 1,
                 train_size_img: tuple = (224, 224),
                 ratio: tuple = (60, 20, 20),
                 is_gray: str = False,
                 class_percentages: dict = None,
                 name_loss: str = None,
                 is_use_class_weights: bool = False,
                 resampling_method: str = None,
                 use_device: str = None,
                 start_learning_rate: float = None,
                 pin_memory: bool = False,
                 num_workers: int = 0,
                 seed: int = 17):

```

```

        self.name_model = name_model
        self.name_model_user = f"{self.name_model}_{prefix}" if prefix != "" else self.name_model
        self.path_to_data = path_to_data
        directories_to_create = [path_to_weights, path_to_metrics_train, path_to_metrics_test]
        self.create_directories_if_not_exist(*directories_to_create)
        self.path_to_weights = os.path.join(path_to_weights, f"{self.name_model}_weights")
        self.path_to_metrics_train = os.path.join(path_to_metrics_train, f"{self.name_model}_train")
        self.path_to_metrics_test = os.path.join(path_to_metrics_test, f"{self.name_model}_test")
        self.num_epochs = num_epochs
        self.batch_size = batch_size
        self.size_img = train_size_img
        self.name_optimizer = name_optimizer
        self.size_img = train_size_img
        self.model = None
        self.train_loader = None
        self.valid_loader = None
        self.test_loader = None
        self.classes = None
        self.total_samples = None
        self.targets = None
        self.class_counts = None
        self.class_weights = None
        self.criterion = None
        self.scheduler = None
        self.imagenet = is_use_imagenet_weights
        self.is_gray = is_gray
        self.class_percentages = class_percentages
        self.name_loss = name_loss
        self.is_use_class_weights = is_use_class_weights
        self.resampling_method = resampling_method
        self.ratio = ratio
        self.use_device = use_device
        self.start_learning_rate = start_learning_rate
        self.pin_memory = pin_memory
        self.num_workers = num_workers
        self.seed = seed

    # Получение списка доступных моделей
    self.model_list = sorted(name for name in models.__dict__
                           if name.islower() and not name.startswith("__")
                           and name != "get_weight"
                           and callable(models.__dict__[name]))

    # Перемещение модели на GPU, если CUDA доступен
    if self.use_device == None:
        self.device = torch.device("cuda" if torch.cuda.is_available() else "cpu")
    elif self.use_device == "cuda":
        self.device = torch.device("cuda")
    elif self.use_device == "cpu":
        if self.pin_memory == True:
            raise Exception("pin_memory mustn't be True with use_device cpu")
        self.device = torch.device("cpu")
    else:
        raise Exception("use_device must be cuda or cpu or None")

```

@staticmethod

```

def seed_everything(seed):
    random.seed(seed)
    os.environ["PYTHONHASHSEED"] = str(seed)
    np.random.seed(seed)
    torch.manual_seed(seed)
    torch.cuda.manual_seed(seed)
    torch.backends.cudnn.deterministic = True

def graduate(self):
    # Фиксируем зерно
    self.seed_everything(self.seed)
    # Получаем трансформер
    self.get_transform()
    # Получаем генераторы обучения, валидации и теста
    self.get_loaders()
    # Загружаем модель
    self.get_model()
    # Получаем веса классов
    self.get_classes_weights()
    # Определяем оптимизатор, функцию потерь и планировщик
    self.get_opt_crit_sh()
    # Вывод архитектуры
    """summary(self.model,
              (3, self.size_img[0], self.size_img[1]),
              self.batch_size)"""

    # Выводим информацию
    print(self.__str__())
    # Обучаем
    self.train_model()
    # Тестируем
    self.evaluate_model()

def __str__(self):
    return f"""
-----



Выбранная модель: {self.name_model}
Пользовательское название модели: {self.name_model_user}
Выбранный оптимизатор: {self.name_optimizer}

-----



"""

```

```

def create_directories_if_not_exist(self, *directories):
    for directory in directories:
        if not os.path.exists(directory):
            os.makedirs(directory)

# Функция для показа изображения
def image_show(self, img):
    img = img / 2 + 0.5 # unnormalize
    np_img = img.cpu().numpy()
    plt.imshow(np.transpose(np_img, (1, 2, 0)))

```

```

plt.show()

# Функция для сохранения модели
def save_model(self):
    # Сохраняем модель
    torch.save({
        'epoch': self.num_epochs,
        'model_state_dict': self.model.state_dict(),
        'optimizer_state_dict': self.optimizer.state_dict()},
        f'{self.path_to_weights}')

def save_metrics_train(self,
                      train_loss_values,
                      valid_loss_values,
                      f1_values):
    metrics = {
        'train_loss': train_loss_values,
        'valid_loss': valid_loss_values,
        'valid_f1': f1_values
    }
    # Сохранение метрик
    torch.save(metrics, self.path_to_metrics_train)

def save_metrics_test(self,
                      f1,
                      class_acc_dir):
    metric = {
        'f1_value': f1,
        'Acc_dir': class_acc_dir
    }
    # Сохранение метрик
    torch.save(metric, self.path_to_metrics_test)

def get_transform(self):
    if self.is_gray:
        self.transform = {
            "train": transforms.Compose([
                transforms.Resize((self.size_img[0], self.size_img[1])),
                transforms.RandomHorizontalFlip(),
                transforms.RandomResizedCrop(size=(self.size_img[0], self.size_img[1])),
                transforms.ToTensor()
            ]),
            "valid": transforms.Compose([
                transforms.Resize((self.size_img[0], self.size_img[1])),
                transforms.ToTensor()
            ])
        }
    else:
        self.transform = {
            "train": transforms.Compose([
                transforms.Resize((self.size_img[0], self.size_img[1])),
                transforms.AutoAugment(),
                transforms.ToTensor(),
                transforms.Normalize(mean=[0.485, 0.456, 0.406], std=[0.229, 0.224, 0.225])
            ]),
            "valid": transforms.Compose([
                transforms.Resize((self.size_img[0], self.size_img[1]))
            ])
        }

```

```

        transforms.Resize((self.size_img[0], self.size_img[1])),
        transforms.ToTensor(),
        transforms.Normalize(mean=[0.485, 0.456, 0.406], std=[0.229, 0.
    ])
}

@staticmethod
def create_imbalanced_dataset(dataset, class_percentages):

    # Проверка входных данных
    if not hasattr(dataset, 'classes'):
        raise ValueError("Dataset must have a 'classes' attribute containing cl

    # Построим индексы для каждого класса
    class_to_indices = {class_name: [] for class_name in dataset.classes}
    for i, (_, label) in enumerate(dataset):
        class_name = dataset.classes[label]
        class_to_indices[class_name].append(i)

    # Отберем заданный процент для каждого класса
    selected_indices = []
    for class_name, percentage in class_percentages.items():
        if class_name not in class_to_indices:
            raise ValueError(f"Class '{class_name}' not found in the dataset.")
        if not (0 <= percentage <= 1):
            raise ValueError("Percentage values must be between 0 and 1.")

        class_indices = class_to_indices[class_name]
        selected_count = int(len(class_indices) * percentage)
        selected_indices.extend(random.sample(class_indices, selected_count))

    # Создаем поднабор данных
    return Subset(dataset, selected_indices)

def get_classes_weights(self):
    # Получение количества примеров для каждого класса
    self.class_counts = np.bincount(self.targets)
    # Вычисление весов классов
    self.class_weights = torch.tensor([self.total_samples / count for count in
                                       self.class_counts],
                                       dtype=torch.float)
    self.class_weights = self.class_weights.to(self.device)

    # Функция для undersampling
    @staticmethod
    def create_undersampled_dataset(dataset):
        class_counts = Counter([label for _, label in dataset])
        min_class_count = min(class_counts.values())
        # Вычисление индексов для каждого класса
        class_indices = {cls: np.where(np.array(dataset.targets) == cls)[0] for cls
        # Обрезка индексов до минимального количества
        undersampled_indices = []
        for cls, indices in class_indices.items():
            undersampled_indices.extend(indices[:min_class_count])
        # Создание поднабора
        return CustomSubset(dataset, undersampled_indices)

```

```

@staticmethod
def create_oversampled_dataset(dataset):
    class_counts = Counter([label for _, label in dataset])
    max_class_count = max(class_counts.values())
    # Сохранение индексов для каждого класса
    class_indices = {cls: np.where(np.array(dataset.targets) == cls)[0] for cls in
                     class_counts}
    oversampled_indices = []
    for cls, indices in class_indices.items():
        # Дублирование индексов, чтобы достичь максимального размера класса
        oversampled_indices.extend(
            np.random.choice(indices, size=max_class_count, replace=True))
    # Создание поднабора
    return CustomSubset(dataset, oversampled_indices)

# Функция для загрузки данных
def get_loaders(self):
    # Список файлов с полными путями
    full_paths = [os.path.join(self.path_to_data, file) for file in os.listdir(
        # Передача в TrainDirCreator
        train_dir_creator = TrainDirCreator(full_paths, "./dataset", self.ratio)
        train_dir_creator.create_train_dirs()
    # Получаем пути к директориям
    train_dir, test_dir, valid_dir = get_path_to_dir("./dataset")
    # Создание датасетов
    train_dataset = ImageFolder(train_dir, transform=self.transform["train"])
    test_dataset = ImageFolder(test_dir, transform=self.transform["valid"])
    valid_dataset = ImageFolder(valid_dir, transform=self.transform["valid"])

    if self.class_percentages is not None:
        # Создание несбалансированного датасета
        train_dataset = self.create_imbalanced_dataset(train_dataset, self.class_percentages)

    resampling_method_list = ["oversampling", "undersampling", None]

    if self.resampling_method not in resampling_method_list:
        raise Exception("resampling_method must be oversampling or undersampling")

    if self.resampling_method == "oversampling":
        train_dataset = self.create_oversampled_dataset(train_dataset)
    elif self.resampling_method == "undersampling":
        train_dataset = self.create_undersampled_dataset(train_dataset)

    # Создание загрузчиков данных
    self.train_loader = DataLoader(train_dataset, batch_size=self.batch_size, pin_memory=False,
                                   num_workers=self.num_workers, shuffle=True)
    self.test_loader = DataLoader(test_dataset, batch_size=self.batch_size, pin_memory=False,
                                 num_workers=self.num_workers, shuffle=False)
    self.valid_loader = DataLoader(valid_dataset, batch_size=self.batch_size, pin_memory=False,
                                   num_workers=self.num_workers, shuffle=False)
    # Список классов
    self.classes = train_dataset.classes
    self.total_samples = len(train_dataset)
    self.targets = train_dataset.targets

def get_model(self):

```

```

# Проверка доступности модели в torchvision
if self.name_model in self.model_list:
    # Проверка доступности весов ImageNet
    if self.imagenet:
        try:
            if self.name_model in ["inception_v3", "googlenet"]:
                # Попытка загрузки модели с весами ImageNet
                self.model = models.__dict__[self.name_model](init_weights=None)
            else:
                if self.name_model in ["regnet_y_128gf", "vit_h_14"]:
                    self.model = models.__dict__[self.name_model](weights="IMAGENET")
                else:
                    self.model = models.__dict__[self.name_model](weights="VIT")
        except KeyError:
            # Если веса ImageNet для данной модели недоступны, загрузка без
            print(f"Предобученные веса ImageNet для модели {self.name_model}")
            f" Загрузка модели без предобученных весов.")
        if self.name_model in ["inception_v3", "googlenet"]:
            # Попытка загрузки модели с весами ImageNet
            self.model = models.__dict__[self.name_model](init_weights=None)
        else:
            self.model = models.__dict__[self.name_model](weights=None)
    else:
        # Если не указано использование весов ImageNet, загрузить модель без
        if self.name_model in ["inception_v3", "googlenet"]:
            self.model = models.__dict__[self.name_model](init_weights=False)
        else:
            self.model = models.__dict__[self.name_model](weights=None)

try:
    name_without_numbers = re.sub(r'\d+', '', self.name_model)
    # Проверка доступности слоя classifier
    if hasattr(self.model, 'classifier'):
        if name_without_numbers == "densenet":
            num_features = self.model.classifier.in_features
            self.model.classifier = nn.Linear(num_features, len(self.classes))
        elif name_without_numbers == "squeezenet__":
            num_features = 512
            self.model.classifier[-1] = nn.Linear(num_features, len(self.classes))
        else:
            num_features = self.model.classifier[-1].in_features
            self.model.classifier[-1] = nn.Linear(num_features, len(self.classes))
    elif hasattr(self.model, 'last_linear'):
        num_features = self.model.last_linear.in_features
        self.model.last_linear = nn.Linear(num_features, len(self.classes))
    elif hasattr(self.model, 'fc'):
        num_features = self.model.fc.in_features
        self.model.fc = nn.Linear(num_features, len(self.classes))
    elif hasattr(self.model, 'head'):
        num_features = self.model.head.in_features
        self.model.head = nn.Linear(num_features, len(self.classes))
    elif hasattr(self.model, "heads"):
        num_features = self.model.heads[0].in_features
        self.model.heads[0] = nn.Linear(num_features, len(self.classes))
    else:

```

```

        print(f"Слой classifier не найден в модели. name_model:{self.name_model}")
    except Exception as ex:
        print(f"Exception: {ex}, name_model: {self.name_model}")

    # Перемещение модели на GPU и указание устройства
    self.model = self.model.to(self.device)
else:
    print(f"Модель {self.name_model} не найдена в torchvision.")
    f"\nСписок доступных моделей: {self.model_list}")

def get_opt_crit_sh(self):
    # Определение функции потерь с учетом весов классов
    available_losses = ["CrossEntropyLoss", "MSELoss", "L1Loss"] # список доступных потерь

    if self.name_loss == "FocalLoss":
        # Используем кастомный FocalLoss
        self.class_weights = self.class_weights if self.is_use_class_weights else None
        self.criterion = FocalLoss(alpha=self.class_weights, gamma=2)
    elif self.name_loss in available_losses:
        # Используем потери из torch.nn
        loss_class = getattr(nn, self.name_loss, None)
        if loss_class is None:
            raise ValueError(f"Loss function {self.name_loss} is not available")
        self.class_weights = self.class_weights if self.is_use_class_weights else None
        self.criterion = loss_class(weight=self.class_weights)
    else:
        raise ValueError(f"Loss function {self.name_loss} is not recognized")

    # Определение оптимизатора
    if self.start_learning_rate is not None:
        lr = self.start_learning_rate
    else:
        lr = 0.001

    self.optimizer = optim.__dict__[f"{self.name_optimizer}"](self.model.parameters(), lr=lr)

    # Создание планировщика LR
    # ReduceLROnPlateau уменьшает скорость обучения, когда метрика перестает уменьшаться
    self.scheduler = ReduceLROnPlateau(self.optimizer, mode='min', patience=2, verbose=True)

# Функция для обучения модели с валидацией
def train_model(self):

    train_loss_values = []
    valid_loss_values = []
    f1_values = []

    for epoch in range(self.num_epochs):
        self.model.train()
        running_loss = 0.0
        for inputs, labels in tqdm(self.train_loader, desc=f"Epoch {epoch + 1}/{self.num_epochs}", unit="sample"):
            inputs, labels = inputs.cuda(), labels.cuda()
            self.optimizer.zero_grad()
            outputs = self.model(inputs)
            loss = self.criterion(outputs, labels)

```

```

        loss.backward()
        self.optimizer.step()
        running_loss += loss.item() * inputs.size(0)

        # Вычисление loss на валидационном датасете и метрик
        self.model.eval()
        valid_loss = 0.0
        best_f1 = 0.0
        all_predictions = []
        all_labels = []
        with torch.no_grad():
            for inputs, labels in tqdm(self.valid_loader, desc=f"Epoch {epoch + 1}"):
                inputs, labels = inputs.cuda(), labels.cuda()
                outputs = self.model(inputs)
                loss = self.criterion(outputs, labels)
                valid_loss += loss.item() * inputs.size(0)
                _, predicted = torch.max(outputs, 1)
                all_predictions.extend(predicted.cpu().numpy())
                all_labels.extend(labels.cpu().numpy())

        epoch_loss = running_loss / len(self.train_loader.dataset)
        valid_loss = valid_loss / len(self.valid_loader.dataset)

        accuracy = accuracy_score(all_labels, all_predictions)
        precision = precision_score(all_labels, all_predictions, average='weighted')
        recall = recall_score(all_labels, all_predictions, average='weighted')
        f1 = f1_score(all_labels, all_predictions, average='weighted')

        # Сообщаем планировщику LR о текущей ошибке на валидационном наборе
        self.scheduler.step(valid_loss)

        # we want to save the model if the accuracy is the best
        if f1 > best_f1:
            self.save_model()
            best_f1 = f1

        # Добавление значений метрик в списки
        train_loss_values.append(epoch_loss)
        valid_loss_values.append(valid_loss)
        f1_values.append(f1)

        # Сохранение метрик
        self.save_metrics_train(train_loss_values,
                               valid_loss_values,
                               f1_values)

    print(f"\nEpoch {epoch + 1}/{self.num_epochs}, Training Loss: {epoch_loss}")
    print(f"Accuracy: {accuracy}, Precision: {precision}, Recall: {recall}, F1: {f1}")

    print("Тренировка завершена!")

# Функция для оценки модели на тестовом датасете
def evaluate_model(self):
    self.model.eval()
    correct = 0

```

```

total = 0
all_predictions = []
all_labels = []

# Initialize variables to track correct predictions for each class
class_correct = [0] * len(self.classes)
class_total = [0] * len(self.classes)

with torch.no_grad():
    for inputs, labels in tqdm(self.test_loader, desc="Test", unit="sample"):
        inputs, labels = inputs.cuda(), labels.cuda()
        outputs = self.model(inputs)
        _, predicted = torch.max(outputs, 1)
        total += labels.size(0)
        correct += (predicted == labels).sum().item()
        all_predictions.extend(predicted.cpu().numpy())
        all_labels.extend(labels.cpu().numpy())

    # Calculate class-wise correct predictions
    for i in range(len(labels)):
        label = labels[i].item()
        class_correct[label] += (predicted[i] == labels[i]).item()
        class_total[label] += 1

accuracy = correct / total
print(f"Test Accuracy: {accuracy}")

precision = precision_score(all_labels, all_predictions, average='weighted')
recall = recall_score(all_labels, all_predictions, average='weighted')
f1 = f1_score(all_labels, all_predictions, average='weighted')
print(f"Precision: {precision}, Recall: {recall}, F1-score: {f1}")

class_acc_dir = {}
# Print accuracy for each class
for i in range(len(self.classes)):
    class_acc = 100 * class_correct[i] / class_total[i] if class_total[i] != 0 else 0
    class_acc_dir[self.classes[i]] = class_acc
    print(f'Accuracy of {self.classes[i]} : {class_acc}%')

self.save_metrics_test(f1,
                      class_acc_dir)

```

## Инференс моделью

### InferenceModel

In [171...]

```

class InferenceModel:
    def __init__(self,
                 model_name: str,
                 num_classes: int,
                 path_to_weights: str,
                 image_paths: List[str],

```

```

prefix: str = "",
use_device: str = None,
classes: Optional[List[str]] = None,
plots: bool = False,
save_plots: bool = False,
plot_dir: str = './result',
size_img: tuple = (64, 64)):

self.name_model = model_name
self.path_to_weights = path_to_weights
self.image_paths = image_paths
self.classes = classes if classes is not None else []
self.save_plots = save_plots
self.plot_dir = plot_dir
self.size_img = size_img
self.use_device = use_device
self.num_classes = num_classes
self.plots = plots
self.device = None
self.prefix = prefix

# Получение списка доступных моделей
self.model_list = sorted(name for name in models.__dict__
                        if name.islower() and not name.startswith('__')
                        and name != "get_weight"
                        and callable(models.__dict__[name]))

# Перемещение модели на GPU, если CUDA доступен
if self.use_device == None:
    self.device = torch.device("cuda" if torch.cuda.is_available() else "cp
elif self.use_device == "cuda":
    self.device = torch.device("cuda")
elif self.use_device == "cpu":
    self.device = torch.device("cpu")
else:
    raise Exception("use_device must be cuda or cpu or None")

def get_model(self):
    # Проверка доступности модели в torchvision
    if self.name_model in self.model_list:
        if self.name_model in ["inception_v3", "googlenet"]:
            self.model = models.__dict__[self.name_model](init_weights=False)
        else:
            self.model = models.__dict__[self.name_model](weights=None)

    try:
        name_without_numbers = re.sub(r'\d+', '', self.name_model)
        # Проверка доступности слоя classifier
        if hasattr(self.model, 'classifier'):
            if name_without_numbers == "densenet":
                num_features = self.model.classifier.in_features
                self.model.classifier = nn.Linear(num_features, self.num_cl
            elif name_without_numbers == "squeezezenet__":
                num_features = 512
                self.model.classifier[-1] = nn.Linear(num_features, self.nu
        else:
            num_features = self.model.classifier[-1].in_features

```

```

        self.model.classifier[-1] = nn.Linear(num_features, self.num_classes)
    elif hasattr(self.model, 'last_linear'):
        num_features = self.model.last_linear.in_features
        self.model.last_linear = nn.Linear(num_features, self.num_classes)
    elif hasattr(self.model, 'fc'):
        num_features = self.model.fc.in_features
        self.model.fc = nn.Linear(num_features, self.num_classes)
    elif hasattr(self.model, 'head'):
        num_features = self.model.head.in_features
        self.model.head = nn.Linear(num_features, self.num_classes)
    elif hasattr(self.model, "heads"):
        num_features = self.model.heads[0].in_features
        self.model.heads[0] = nn.Linear(num_features, self.num_classes)
    else:
        print(f"Слой classifier не найден в модели. name_model:{self.name_model}")
except Exception as ex:
    print(f"Exception: {ex}, name_model: {self.name_model}")

# Перемещение модели на GPU и указание устройства
self.model = self.model.to(self.device)
log.info("Модель инициализирована")
else:
    print(f"Модель {self.name_model} не найдена в torchvision."
          f"\nСписок доступных моделей: {self.model_list}")

def load_model(self):
    if self.prefix != "":
        path = os.path.join(self.path_to_weights, f"{self.name_model}_{self.prefix}.pt")
    else:
        path = os.path.join(self.path_to_weights, f"{self.name_model}.pt")
    try:
        if self.name_model in models.__dict__:
            if os.path.exists(path):
                state_dict = torch.load(path, map_location=self.device)['model']
                self.model.load_state_dict(state_dict)
                log.info(f"Модель {self.name_model} успешно загружена с весами")
            else:
                log.warning(f"Модель {self.name_model} не найдена.")
    except Exception as e:
        log.exception(f"Ошибка при загрузке модели: {e}")

def get_transform(self):
    return transforms.Compose([
        transforms.Resize((self.size_img[0], self.size_img[1])),
        transforms.ToTensor(),
        transforms.Normalize(mean=[0.485, 0.456, 0.406], std=[0.229, 0.224, 0.2])
])

def predict(self):
    self.get_model()
    self.load_model()
    self.model.eval()
    predictions = []
    all_images = []

    with torch.no_grad():

```

```

        for image_path in tqdm(self.image_paths, desc="Classifying", unit="image"):
            try:
                # Load image
                image = Image.open(image_path).convert('RGB')
                image = self.get_transform()(image).unsqueeze(0).to(self.device)

                # Inference
                output = self.model(image)
                _, predicted_class = torch.max(output, 1)
                predicted_label = predicted_class.item()

                # Store prediction and image path
                predictions.append(predicted_label)
                all_images.append((image_path, predicted_label))

                # If required, plot and save image
                if self.save_plots:
                    self.plot_image(image_path, predicted_label)

            except Exception as e:
                print(f"Ошибка при обработке изображения {image_path}: {e}")
                predictions.append(None)

        print(f"predictions: {predictions}")

    return predictions, all_images

def plot_image(self, image_path, predicted_label):
    image = Image.open(image_path)
    if self.plots is not None:
        plt.imshow(image)
        plt.title(f"Predicted: {self.classes[predicted_label]} if self.classes else")
        plt.axis('off')
    if self.save_plots:
        if not os.path.exists(self.plot_dir):
            os.makedirs(self.plot_dir)
        plt.savefig(os.path.join(self.plot_dir, os.path.basename(image_path)))
        plt.show()

def evaluate(self, predictions, ground_truth):
    # Calculate metrics
    precision = precision_score(ground_truth, predictions, average='weighted')
    recall = recall_score(ground_truth, predictions, average='weighted')
    f1 = f1_score(ground_truth, predictions, average='weighted')

    print(f"Precision: {precision}, Recall: {recall}, F1-score: {f1}")

    return precision, recall, f1

```

## Визуализация графиков обучения

### MetricsVisualizer

In [219...]

```
class MetricsVisualizer:
    def __init__(self,
                 prefix: str = "",
                 path_to_metrics_train: str = "./metrics_train",
                 path_to_metrics_test: str = "./metrics_test",
                 path_to_save_plots: str = None):

        self.prefix = prefix
        if path_to_save_plots:
            os.makedirs(path_to_save_plots, exist_ok=True)
        self.path_to_save_plots = path_to_save_plots if path_to_save_plots is not None else None
        self.metrics_train_dir = os.path.join(path_to_metrics_train)
        self.metrics_test_dir = os.path.join(path_to_metrics_test)
        self.train_loss_values = {}
        self.valid_loss_values = {}
        self.f1_values_valid = {}
        self.f1_values_test = {}
        self.class_acc_dir_values = {}

    # Инициализируем сохранение графиков
    def load_train_metrics():
        self.load_train_metrics()
        self.load_test_metrics()
        self.plot_metrics()

    def _load_metrics(self, directory, files_dict, key_name):
        for file in os.listdir(directory):
            if file.endswith(".pt") and f"_{self.prefix}" in file:
                metrics = torch.load(os.path.join(directory, file))
                model_name = file.replace('.pt', '').replace(f'_{self.prefix}', '')
                files_dict[model_name] = metrics[key_name]

    def load_train_metrics(self):
        self._load_metrics(self.metrics_train_dir, self.train_loss_values, 'train_loss')
        self._load_metrics(self.metrics_train_dir, self.valid_loss_values, 'valid_loss')
        self._load_metrics(self.metrics_train_dir, self.f1_values_valid, 'valid_f1')

    def load_test_metrics(self):
        self._load_metrics(self.metrics_test_dir, self.f1_values_test, 'f1_value')
        self._load_metrics(self.metrics_test_dir, self.class_acc_dir_values, 'Acc_dir')

    def plot_metrics(self):
        fig, axs = plt.subplots(2, 2, figsize=(14, 10))

        # Сравнение категориальной кроссэнтропии для разных моделей на тренировке
        for model, train_loss in self.train_loss_values.items():
            axs[0, 0].plot(train_loss, label=model, linewidth=2)
        axs[0, 0].set_title('Функция потерь на тренировке', fontsize=12)
        axs[0, 0].set_xlabel('Эпоха')
        axs[0, 0].set_ylabel('Значение функции потерь', fontsize=12)

        # Вычисление аддитивных лимитов для оси Y
        all_values = [value for values in self.train_loss_values.values() for value in values]
        lower_limit = np.percentile(all_values, 0) # нижний предел (например, 5-й)
        upper_limit = np.percentile(all_values, 95) # верхний предел (например, 95-й)
```

```

try:
    # Применение ограничений
    axs[0, 0].set_ylim(lower_limit, upper_limit)
except Exception as ex:
    pass

for model, valid_loss in self.valid_loss_values.items():
    axs[0, 1].plot(valid_loss, label=model, linewidth=2)
axs[0, 1].set_title('Функция потерь на валидации', fontsize=12)
axs[0, 1].set_xlabel('Эпоха')
axs[0, 1].set_ylabel('Значение функции потерь', fontsize=12)

# Вычисление адаптивных лимитов для оси Y
all_values = [value for values in self.valid_loss_values.values() for value
lower_limit = np.percentile(all_values, 0) # нижний предел (например, 5-й
upper_limit = np.percentile(all_values, 95) # верхний предел (например, 95

try:
    # Применение ограничений
    axs[0, 1].set_ylim(lower_limit, upper_limit)
except Exception as ex:
    axs[0, 1].set_ylim(0.4, 0.8)

for model, f1_valid in self.f1_values_valid.items():
    axs[1, 0].plot(f1_valid, label=model, linewidth=2)
axs[1, 0].set_title('F1-мера на валидации', fontsize=12)
axs[1, 0].set_xlabel('Эпоха')
axs[1, 0].set_ylabel('Значение метрики F1-мера', fontsize=12)

for model, f1_score in self.f1_values_test.items():
    bar = axs[1, 1].bar(model, f1_score, label=model)
    axs[1, 1].text(bar.patches[0].get_x() + bar.patches[0].get_width() / 2,
                  bar.patches[0].get_height() + 0.02,
                  f'{f1_score:.2f}',
                  ha='center', va='bottom', rotation=90, fontsize=8, color='red')

    axs[1, 1].set_title('F1-мера на тесте', fontsize=12)
    axs[1, 1].set_xlabel('Название модели')
    axs[1, 1].set_ylabel('Значение метрики F1-мера', fontsize=12)
    plt.setp(axs[1, 1].get_xticklabels(), rotation=90, fontsize=6)

# Добавление общей легенды
handles, labels = axs[0, 0].get_legend_handles_labels()
fig.legend(handles, labels, loc='center right', fontsize=8, frameon=False)

# Обрезаем графики, чтобы освободить место для легенды
plt.subplots_adjust(left=0.1, right=0.8, top=0.9, bottom=0.1)
path = os.path.join(self.path_to_save_plots, f"PlotsMetrics_{self.prefix}.png")
plt.savefig(path, dpi=500)
plt.show()

plt.figure(figsize=(8, 8))
class_names = list(self.class_acc_dir_values[list(self.class_acc_dir_values
num_classes = len(class_names))

for i, class_name in enumerate(class_names):

```

```

    plt.subplot(num_classes, 1, i + 1)
    for model, class_acc_dir in self.class_acc_dir_values.items():
        acc = class_acc_dir.get(class_name, 0)
        bar = plt.bar(model, acc, label=model)
        percentage = acc
        plt.text(bar[0].get_x() + bar[0].get_width() / 2.,
                  bar[0].get_height() - bar[0].get_height() * 0.3,
                  f'{percentage:.2f}%', ha='center', va='bottom', rotation=90)

    plt.xlabel('Название модели')
    plt.ylabel('Accuracy')
    plt.title(f'Accuracy для класса: {class_name}')
    plt.xticks(rotation=90, fontsize=8)
    plt.subplots_adjust(hspace=0.5)

plt.tight_layout()
path = os.path.join(self.path_to_save_plots, f"AccuracyForClass_{self.prefix}")
plt.savefig(path, dpi=500)
plt.show()

```

## Пайплайн

### GraduateModelPipeline

```

In [66]: @dataclass
class GraduateModelPipeline:
    entry: EntryGraduateModel

    def __post_init__(self):
        pass

    def graduate(self):

        prefix = self.entry.Prefix
        models = self.entry.Models
        name_optimizers = self.entry.NameOptimizers
        is_use_imagenet_weights = self.entry.UseImageNetWeights
        ratio = self.entry.Ratio
        path_to_data = self.entry.PathData
        path_to_weights = self.entry.PathWeights
        use_device = self.entry.UseDevice
        name_loss = self.entry.NameLoss
        is_gray = self.entry.IsGray
        class_percentages = self.entry.ClassPercentages
        is_use_class_weights = self.entry.UseClassWeights
        resampling_method = self.entry.ResamplingMethod
        start_learning_rate = self.entry.StartLearningRate
        train_size_img = self.entry.SizeImg
        batch_size = self.entry.BatchSize
        num_workers = self.entry.NumWorkers
        pin_memory = self.entry.PinMemory
        num_epochs = self.entry.NumEpochs

```

```

seed = self.entry.Seed

path_to_metrics_train = self.entry.PathMetricsTrain
path_to_metrics_test = self.entry.PathMetricsTest
path_to_save_plots = self.entry.PathSavePlots

for index, name_model in enumerate(models):

    try:
        train = GraduateModel(
            prefix=prefix,
            name_model=name_model,
            path_to_data=path_to_data,
            path_to_weights=path_to_weights,
            path_to_metrics_train=path_to_metrics_train,
            path_to_metrics_test=path_to_metrics_test,
            is_use_imagenet_weights=is_use_imagenet_weights,
            name_optimizer=name_optimizers[index],
            name_loss=name_loss,
            num_epochs=num_epochs,
            batch_size=batch_size,
            train_size_img=train_size_img,
            is_gray=is_gray,
            class_percentages=class_percentages,
            is_use_class_weights=is_use_class_weights,
            resampling_method=resampling_method,
            use_device=use_device,
            num_workers=num_workers,
            pin_memory=pin_memory,
            seed=seed)
        train.graduate()
    except Exception as ex:
        log.exception("GraduateModel\n", exc_info=ex)

# Построение графиков
try:
    metrics_visualizer = MetricsVisualizer(prefix=prefix,
                                             path_to_metrics_train=path_to_me
                                             path_to_metrics_test=path_to_met
                                             path_to_save_plots=path_to_save_
except Exception as ex:
    log.exception("MetricsVisualiser\n", exc_info=ex)

```

## InferenceModelPipeline

In [165...]

```

@dataclass
class InferenceModelPipeline:
    entry: EntryInferenceModel

    def __post_init__(self):
        pass

    def inference(self):

```

```

prefix = self.entry.Prefix
name_model = self.entry.NameModel
num_classes = self.entry.NumClasses
path_to_weights = self.entry.PathWeights
image_path_list = self.entry.ImageList
use_device = self.entry.UseDevice
classes = self.entry.Classes
plots = self.entry.Plots
save_plots = self.entry.SavePlots
save_path_plots = self.entry.SavePathPlots
ground_truth = self.entry.GroundTruth
size_img = self.entry.SizeImg

try:
    inference_model = InferenceModel(
        prefix=prefix,
        model_name=name_model,
        num_classes=num_classes,
        path_to_weights=path_to_weights,
        image_paths=image_path_list,
        use_device=use_device,
        size_img=size_img,
        classes=classes,
        plots=plots,
        save_plots=save_plots,
        plot_dir=save_path_plots)
    predictions, all_images = inference_model.predict()
    log.info(f"Predictions: {predictions}")
    if ground_truth is not None:
        precision, recall, f1 = inference_model.evaluate(predictions, ground_truth)
        log.info(f"Precision: {precision}, Recall: {recall}, F1: {f1}")
    return predictions, all_images
except Exception as ex:
    log.exception("InferenceModel\n", exc_info=ex)

```

## Список моделей и оптимизаторов

```

In [68]: exclude_model = ["get_weight", "convnext_base", "convnext_large", "convnext_small",
                     "densenet161", "efficientnet_b5", "efficientnet_b6", "efficientnet_b7",
                     "efficientnet_v2_l", "efficientnet_v2_m", "regnet_x_8gf", "regnet_x_16gf",
                     "regnet_y_32gf", "regnet_y_128gf", "resnext101_32x8d", "vit_h_14",
                     "vit_l_32", "googlenet", "inception_v3", "squeezenet1_0", "squeeze
                     ...

optimizer_list = ["SGD", "SGD", "SGD", "SGD", "SGD", "AdamW", "AdamW", "AdamW", "Ad
                  "AdamW", "AdamW", "AdamW", "AdamW", "AdamW", "AdamW", "AdamW", "A
                  "SGD", "SGD", "SGD", "SGD", "SGD", "SGD", "SGD", "SGD", "SGD", "SGD",
                  "SGD", "SGD", "SGD", "SGD", "SGD", "AdamW", "AdamW", "AdamW", "Ad
                  "SGD", "SGD", "SGD", "SGD", "SGD", "SGD", "SGD", "SGD", "SGD", "SGD",
                  "SGD", "SGD", "SGD", "SGD", "SGD", "SGD", "SGD", "SGD", "SGD", "SGD"]

# Получение списка доступных моделей
model_list = sorted(name for name in models.__dict__
                     if name.islower() and not name.startswith("__")
                     and name not in exclude_model)

```

```
        and callable(models.__dict__[name]))
print(model_list)

['alexnet', 'convnext_tiny', 'densenet121', 'densenet169', 'densenet201', 'efficientnet_b0', 'efficientnet_b1', 'efficientnet_b2', 'efficientnet_b3', 'efficientnet_b4', 'efficientnet_v2_s', 'mnasnet0_5', 'mnasnet0_75', 'mnasnet1_0', 'mnasnet1_3', 'mobilenet_v2', 'mobilenet_v3_large', 'mobilenet_v3_small', 'regnet_x_16gf', 'regnet_x_1_6gf', 'regnet_x_3_2gf', 'regnet_x_400mf', 'regnet_x_800mf', 'regnet_y_16gf', 'regnet_y_1_6gf', 'regnet_y_3_2gf', 'regnet_y_400mf', 'regnet_y_800mf', 'regnet_y_8gf', 'resnet101', 'resnet152', 'resnet18', 'resnet34', 'resnet50', 'resnext101_64x4d', 'resnext50_32x4d', 'shufflenet_v2_x0_5', 'shufflenet_v2_x1_0', 'shufflenet_v2_x1_5', 'shufflenet_v2_x2_0', 'swin_b', 'swin_s', 'swin_t', 'vgg11', 'vgg11_bn', 'vgg13', 'vgg13_bn', 'vgg16', 'vgg16_bn', 'vgg19', 'vgg19_bn', 'vit_b_16', 'vit_b_32', 'wide_resnet101_2', 'wide_resnet50_2']
```

## Эксперименты

### Exp1 / Дисбаланс классов + кроссэнтропия

```
In [27]: graduate_pipeline = validate_with_pydantic(EntryGraduateModel)(GraduateModelPipeline)
entry = {
    "prefix": "Exp1",
    "models": model_list,
    "name_optimizers": optimizer_list,
    "name_loss": "CrossEntropyLoss",
    "ratio": (70, 15, 15),
    "size_img": (64, 64),
    "batch_size": 25,
    "num_epochs": 10,
    "class_percentage": {"cats": 0.3, "dogs": 1.0}
}
)
```

```
In [28]: graduate_pipeline.graduate()
```

```
Class_name: cats
Train_count: 900
Test_count: 300
Valid_count: 300
Shutil images: 100%|██████████| 150
0/1500 [00:00<00:00, 1858.24image/s]
Class_name: dogs
Train_count: 900
Test_count: 300
Valid_count: 300
Shutil images: 100%|██████████| 150
0/1500 [00:00<00:00, 1755.94image/s]
```

-----  
Выбранная модель: alexnet  
Пользовательское название модели: alexnet\_Exp1  
Выбранный оптимизатор: SGD  
-----

```
Epoch 1/10 (Train): 100%|██████████| 1  
17/117 [00:07<00:00, 16.42sample/s]  
Epoch 1/10 (Eval): 100%|██████████| 1  
71/71 [00:02<00:00, 24.70sample/s]  
Epoch 1/10, Training Loss: 0.6933255725482133, Validation Loss: 0.6931324764496862  
Accuracy: 0.5033898305084745, Precision: 0.25340132145935074, Recall: 0.503389830508  
4745, F1-score: 0.3371066057745591  
Epoch 2/10 (Train): 100%|██████████| 1  
17/117 [00:08<00:00, 14.38sample/s]  
Epoch 2/10 (Eval): 100%|██████████| 1  
71/71 [00:02<00:00, 23.69sample/s]  
Epoch 2/10, Training Loss: 0.6931735874039413, Validation Loss: 0.6931255032113717  
Accuracy: 0.5033898305084745, Precision: 0.25340132145935074, Recall: 0.503389830508  
4745, F1-score: 0.3371066057745591  
Epoch 3/10 (Train): 100%|██████████| 1  
17/117 [00:07<00:00, 14.97sample/s]  
Epoch 3/10 (Eval): 100%|██████████| 1  
71/71 [00:02<00:00, 24.12sample/s]  
Epoch 3/10, Training Loss: 0.6931035044546239, Validation Loss: 0.6931205299277764  
Accuracy: 0.5033898305084745, Precision: 0.25340132145935074, Recall: 0.503389830508  
4745, F1-score: 0.3371066057745591  
Epoch 4/10 (Train): 100%|██████████| 1  
17/117 [00:07<00:00, 15.05sample/s]  
Epoch 4/10 (Eval): 100%|██████████| 1  
71/71 [00:02<00:00, 24.71sample/s]  
Epoch 00004: reducing learning rate of group 0 to 1.0000e-04.  
Epoch 4/10, Training Loss: 0.6932181448173327, Validation Loss: 0.6931170706695082  
Accuracy: 0.5033898305084745, Precision: 0.25340132145935074, Recall: 0.503389830508  
4745, F1-score: 0.3371066057745591  
Epoch 5/10 (Train): 100%|██████████| 1  
17/117 [00:07<00:00, 15.44sample/s]  
Epoch 5/10 (Eval): 100%|██████████| 1  
71/71 [00:03<00:00, 22.62sample/s]  
Epoch 5/10, Training Loss: 0.6933068363653462, Validation Loss: 0.6931168187809529  
Accuracy: 0.5033898305084745, Precision: 0.25340132145935074, Recall: 0.503389830508  
4745, F1-score: 0.3371066057745591  
Epoch 6/10 (Train): 100%|██████████| 1  
17/117 [00:08<00:00, 14.42sample/s]  
Epoch 6/10 (Eval): 100%|██████████| 1  
71/71 [00:03<00:00, 23.65sample/s]  
Epoch 6/10, Training Loss: 0.6932172757905996, Validation Loss: 0.6931166291910377  
Accuracy: 0.5033898305084745, Precision: 0.25340132145935074, Recall: 0.503389830508  
4745, F1-score: 0.3371066057745591
```

```
Epoch 7/10 (Train): 100%|██████████| 1  
17/117 [00:07<00:00, 15.31sample/s]  
Epoch 7/10 (Eval): 100%|██████████|  
71/71 [00:02<00:00, 24.43sample/s]  
Epoch 00007: reducing learning rate of group 0 to 1.0000e-05.  
  
Epoch 7/10, Training Loss: 0.6932283901367553, Validation Loss: 0.6931163352088067  
Accuracy: 0.5033898305084745, Precision: 0.25340132145935074, Recall: 0.503389830508  
4745, F1-score: 0.3371066057745591  
  
Epoch 8/10 (Train): 100%|██████████| 1  
17/117 [00:07<00:00, 14.94sample/s]  
Epoch 8/10 (Eval): 100%|██████████|  
71/71 [00:02<00:00, 24.57sample/s]  
Epoch 8/10, Training Loss: 0.6932276033881268, Validation Loss: 0.6931163047329855  
Accuracy: 0.5033898305084745, Precision: 0.25340132145935074, Recall: 0.503389830508  
4745, F1-score: 0.3371066057745591  
  
Epoch 9/10 (Train): 100%|██████████| 1  
17/117 [00:07<00:00, 14.99sample/s]  
Epoch 9/10 (Eval): 100%|██████████|  
71/71 [00:03<00:00, 23.06sample/s]  
Epoch 9/10, Training Loss: 0.6932014255102078, Validation Loss: 0.6931162821707753  
Accuracy: 0.5033898305084745, Precision: 0.25340132145935074, Recall: 0.503389830508  
4745, F1-score: 0.3371066057745591  
  
Epoch 10/10 (Train): 100%|██████████| 1  
17/117 [00:07<00:00, 15.36sample/s]  
Epoch 10/10 (Eval): 100%|██████████|  
71/71 [00:02<00:00, 24.04sample/s]  
Epoch 00010: reducing learning rate of group 0 to 1.0000e-06.  
  
Epoch 10/10, Training Loss: 0.6931629197862231, Validation Loss: 0.693116250011207  
Accuracy: 0.5033898305084745, Precision: 0.25340132145935074, Recall: 0.503389830508  
4745, F1-score: 0.3371066057745591  
Тренировка завершена!  
  
Test: 100%|██████████|  
72/72 [00:03<00:00, 19.32sample/s]  
Test Accuracy: 0.496098104793757  
Precision: 0.2461133295799575, Recall: 0.496098104793757, F1-score: 0.32900693984086  
715  
Accuracy of cats : 100 %  
Accuracy of dogs : 0 %  
  
Class_name: cats  
Train_count: 900  
Test_count: 300  
Valid_count: 300  
  
Shutil images: 100%|██████████| 150  
0/1500 [00:00<00:00, 1875.81image/s]  
Class_name: dogs  
Train_count: 900  
Test_count: 300  
Valid_count: 300  
  
Shutil images: 100%|██████████| 150  
0/1500 [00:00<00:00, 1787.23image/s]
```

-----  
Выбранная модель: convnext\_tiny  
Пользовательское название модели: convnext\_tiny\_Exp1  
Выбранный оптимизатор: SGD  
-----

```
Epoch 1/10 (Train): 100%|██████████| 1  
17/117 [00:10<00:00, 11.67sample/s]  
Epoch 1/10 (Eval): 100%|██████████| 1  
71/71 [00:03<00:00, 23.60sample/s]  
Epoch 1/10, Training Loss: 0.7224499498065651, Validation Loss: 0.6782357379541559  
Accuracy: 0.5519774011299435, Precision: 0.5524218644279238, Recall: 0.5519774011299435, F1-score: 0.5500154698199233  
Epoch 2/10 (Train): 100%|██████████| 1  
17/117 [00:09<00:00, 12.07sample/s]  
Epoch 2/10 (Eval): 100%|██████████| 1  
71/71 [00:03<00:00, 23.18sample/s]  
Epoch 2/10, Training Loss: 0.7055071843373114, Validation Loss: 0.6754065516304835  
Accuracy: 0.5728813559322034, Precision: 0.5730208019359492, Recall: 0.5728813559322034, F1-score: 0.5722914198438971  
Epoch 3/10 (Train): 100%|██████████| 1  
17/117 [00:09<00:00, 12.19sample/s]  
Epoch 3/10 (Eval): 100%|██████████| 1  
71/71 [00:03<00:00, 23.49sample/s]  
Epoch 3/10, Training Loss: 0.6983874056991279, Validation Loss: 0.664170292306081  
Accuracy: 0.5836158192090396, Precision: 0.5836433787714821, Recall: 0.5836158192090396, F1-score: 0.5836204709893781  
Epoch 4/10 (Train): 100%|██████████| 1  
17/117 [00:09<00:00, 12.14sample/s]  
Epoch 4/10 (Eval): 100%|██████████| 1  
71/71 [00:03<00:00, 23.25sample/s]  
Epoch 4/10, Training Loss: 0.6967111543852471, Validation Loss: 0.669619344553705  
Accuracy: 0.5751412429378531, Precision: 0.5751182823849705, Recall: 0.5751412429378531, F1-score: 0.575114036934636  
Epoch 5/10 (Train): 100%|██████████| 1  
17/117 [00:09<00:00, 12.22sample/s]  
Epoch 5/10 (Eval): 100%|██████████| 1  
71/71 [00:03<00:00, 23.59sample/s]  
Epoch 5/10, Training Loss: 0.686466957094573, Validation Loss: 0.6614064811649969  
Accuracy: 0.580225988700565, Precision: 0.5805395901091347, Recall: 0.580225988700565, F1-score: 0.5793926654215571  
Epoch 6/10 (Train): 100%|██████████| 1  
17/117 [00:09<00:00, 11.99sample/s]  
Epoch 6/10 (Eval): 100%|██████████| 1  
71/71 [00:03<00:00, 23.57sample/s]  
Epoch 6/10, Training Loss: 0.6870229857641185, Validation Loss: 0.6655065621023124  
Accuracy: 0.5813559322033899, Precision: 0.5814274172059531, Recall: 0.5813559322033899, F1-score: 0.5813499189130932
```

```
Epoch 7/10 (Train): 100%|██████████| 1  
17/117 [00:09<00:00, 12.30sample/s]  
Epoch 7/10 (Eval): 100%|██████████| 1  
71/71 [00:03<00:00, 23.28sample/s]  
Epoch 7/10, Training Loss: 0.6820132057498464, Validation Loss: 0.6527733757334241  
Accuracy: 0.6005649717514124, Precision: 0.6015225288495102, Recall: 0.6005649717514  
124, F1-score: 0.5999617847496937  
Epoch 8/10 (Train): 100%|██████████| 1  
17/117 [00:09<00:00, 12.42sample/s]  
Epoch 8/10 (Eval): 100%|██████████| 1  
71/71 [00:03<00:00, 22.10sample/s]  
Epoch 8/10, Training Loss: 0.6838237212037616, Validation Loss: 0.6511225890641832  
Accuracy: 0.5943502824858757, Precision: 0.5945732709952575, Recall: 0.5943502824858  
757, F1-score: 0.5942674043312999  
Epoch 9/10 (Train): 100%|██████████| 1  
17/117 [00:09<00:00, 11.89sample/s]  
Epoch 9/10 (Eval): 100%|██████████| 1  
71/71 [00:03<00:00, 22.31sample/s]  
Epoch 9/10, Training Loss: 0.6812327204296408, Validation Loss: 0.6526899785645264  
Accuracy: 0.6, Precision: 0.6010225682194127, Recall: 0.6, F1-score: 0.5993418024486  
79  
Epoch 10/10 (Train): 100%|██████████| 1  
17/117 [00:10<00:00, 11.52sample/s]  
Epoch 10/10 (Eval): 100%|██████████| 1  
71/71 [00:03<00:00, 22.25sample/s]  
Epoch 10/10, Training Loss: 0.6853103782315219, Validation Loss: 0.6469701387114444  
Accuracy: 0.6135593220338983, Precision: 0.6158227011550061, Recall: 0.6135593220338  
983, F1-score: 0.6111295867531767  
Тренировка завершена!  
Test: 100%|██████████| 1  
72/72 [00:03<00:00, 18.82sample/s]  
Test Accuracy: 0.6042363433667781  
Precision: 0.6076683656896441, Recall: 0.6042363433667781, F1-score: 0.6017839659614  
047  
Accuracy of cats : 68 %  
Accuracy of dogs : 52 %  
  
Class_name: cats  
Train_count: 900  
Test_count: 300  
Valid_count: 300  
Shutil images: 100%|██████████| 150  
0/1500 [00:00<00:00, 1855.72image/s]  
Class_name: dogs  
Train_count: 900  
Test_count: 300  
Valid_count: 300  
Shutil images: 100%|██████████| 150  
0/1500 [00:00<00:00, 1842.91image/s]
```

-----  
Выбранная модель: densenet121  
Пользовательское название модели: densenet121\_Exp1  
Выбранный оптимизатор: SGD  
-----

```
Epoch 1/10 (Train): 100%|██████████| 1  
17/117 [00:21<00:00, 5.49sample/s]  
Epoch 1/10 (Eval): 100%|██████████| 1  
71/71 [00:05<00:00, 12.83sample/s]  
Epoch 1/10, Training Loss: 0.6861347039118461, Validation Loss: 0.6792224150592998  
Accuracy: 0.5677966101694916, Precision: 0.5789844692944902, Recall: 0.5677966101694  
916, F1-score: 0.5496612429130909  
Epoch 2/10 (Train): 100%|██████████| 1  
17/117 [00:20<00:00, 5.72sample/s]  
Epoch 2/10 (Eval): 100%|██████████| 1  
71/71 [00:05<00:00, 13.71sample/s]  
Epoch 2/10, Training Loss: 0.6771092992722784, Validation Loss: 0.6705324419137448  
Accuracy: 0.6112994350282486, Precision: 0.6205056738953446, Recall: 0.611299435028  
486, F1-score: 0.6027230372586625  
Epoch 3/10 (Train): 100%|██████████| 1  
17/117 [00:20<00:00, 5.65sample/s]  
Epoch 3/10 (Eval): 100%|██████████| 1  
71/71 [00:05<00:00, 13.60sample/s]  
Epoch 3/10, Training Loss: 0.6673782762188548, Validation Loss: 0.6639382861091592  
Accuracy: 0.6152542372881356, Precision: 0.628330307430552, Recall: 0.61525423728813  
56, F1-score: 0.6040989682956611  
Epoch 4/10 (Train): 100%|██████████| 1  
17/117 [00:20<00:00, 5.70sample/s]  
Epoch 4/10 (Eval): 100%|██████████| 1  
71/71 [00:05<00:00, 13.64sample/s]  
Epoch 4/10, Training Loss: 0.6644193392816351, Validation Loss: 0.6565416652267262  
Accuracy: 0.6305084745762712, Precision: 0.6500436509286674, Recall: 0.6305084745762  
712, F1-score: 0.6170211702251328  
Epoch 5/10 (Train): 100%|██████████| 1  
17/117 [00:20<00:00, 5.72sample/s]  
Epoch 5/10 (Eval): 100%|██████████| 1  
71/71 [00:05<00:00, 13.30sample/s]  
Epoch 5/10, Training Loss: 0.6611493007421003, Validation Loss: 0.6522290920470394  
Accuracy: 0.6389830508474577, Precision: 0.6597294491927979, Recall: 0.6389830508474  
577, F1-score: 0.6258873083283591  
Epoch 6/10 (Train): 100%|██████████| 1  
17/117 [00:20<00:00, 5.78sample/s]  
Epoch 6/10 (Eval): 100%|██████████| 1  
71/71 [00:05<00:00, 14.07sample/s]  
Epoch 6/10, Training Loss: 0.655658473904775, Validation Loss: 0.6479252324265948  
Accuracy: 0.6322033898305085, Precision: 0.6647718762317698, Recall: 0.6322033898305  
085, F1-score: 0.6118541908972215
```

```
Epoch 7/10 (Train): 100%|██████████| 1  
17/117 [00:19<00:00, 5.98sample/s]  
Epoch 7/10 (Eval): 100%|██████████|  
71/71 [00:05<00:00, 13.96sample/s]  
Epoch 7/10, Training Loss: 0.6454464864698153, Validation Loss: 0.6413889394304847  
Accuracy: 0.6519774011299435, Precision: 0.6569422769374572, Recall: 0.6519774011299435, F1-score: 0.6487389838464171  
Epoch 8/10 (Train): 100%|██████████| 1  
17/117 [00:19<00:00, 6.05sample/s]  
Epoch 8/10 (Eval): 100%|██████████|  
71/71 [00:05<00:00, 13.61sample/s]  
Epoch 8/10, Training Loss: 0.649853673575266, Validation Loss: 0.6360503779461155  
Accuracy: 0.656497175141243, Precision: 0.6658390058093387, Recall: 0.656497175141243, F1-score: 0.6510063317950939  
Epoch 9/10 (Train): 100%|██████████| 1  
17/117 [00:19<00:00, 5.98sample/s]  
Epoch 9/10 (Eval): 100%|██████████|  
71/71 [00:05<00:00, 13.87sample/s]  
Epoch 9/10, Training Loss: 0.6414696042099745, Validation Loss: 0.6328343822289322  
Accuracy: 0.6548022598870057, Precision: 0.6643175224531157, Recall: 0.6548022598870057, F1-score: 0.6491315382385457  
Epoch 10/10 (Train): 100%|██████████| 1  
17/117 [00:19<00:00, 5.99sample/s]  
Epoch 10/10 (Eval): 100%|██████████|  
71/71 [00:05<00:00, 13.59sample/s]  
Epoch 10/10, Training Loss: 0.6397654499355614, Validation Loss: 0.6278493182975694  
Accuracy: 0.6581920903954802, Precision: 0.658879661069222, Recall: 0.6581920903954802, F1-score: 0.657644995910891  
Тренировка завершена!  
Test: 100%|██████████|  
72/72 [00:05<00:00, 13.33sample/s]  
Test Accuracy: 0.6683389074693422  
Precision: 0.6696716820496154, Recall: 0.6683389074693422, F1-score: 0.6678945888628517  
Accuracy of cats : 70 %  
Accuracy of dogs : 63 %  
  
Class_name: cats  
Train_count: 900  
Test_count: 300  
Valid_count: 300  
Shutil images: 100%|██████████| 150  
0/1500 [00:00<00:00, 1866.82image/s]  
Class_name: dogs  
Train_count: 900  
Test_count: 300  
Valid_count: 300  
Shutil images: 100%|██████████| 150  
0/1500 [00:00<00:00, 1771.52image/s]
```

-----  
Выбранная модель: densenet169  
Пользовательское название модели: densenet169\_Exp1  
Выбранный оптимизатор: SGD  
-----

```
Epoch 1/10 (Train): 100%|██████████| 1  
17/117 [00:25<00:00, 4.53sample/s]  
Epoch 1/10 (Eval): 100%|██████████| 1  
71/71 [00:06<00:00, 11.32sample/s]  
Epoch 1/10, Training Loss: 0.6979774566976235, Validation Loss: 0.6895404766171666  
Accuracy: 0.536723163841808, Precision: 0.5466664098652686, Recall: 0.536723163841808, F1-score: 0.5055629589527895  
Epoch 2/10 (Train): 100%|██████████| 1  
17/117 [00:25<00:00, 4.59sample/s]  
Epoch 2/10 (Eval): 100%|██████████| 1  
71/71 [00:06<00:00, 11.39sample/s]  
Epoch 2/10, Training Loss: 0.6808787794698176, Validation Loss: 0.68533539317422  
Accuracy: 0.5610169491525424, Precision: 0.5698288376628357, Recall: 0.561016949152424, F1-score: 0.5442834854897793  
Epoch 3/10 (Train): 100%|██████████| 1  
17/117 [00:26<00:00, 4.48sample/s]  
Epoch 3/10 (Eval): 100%|██████████| 1  
71/71 [00:06<00:00, 11.33sample/s]  
Epoch 3/10, Training Loss: 0.6807962973858086, Validation Loss: 0.6785378515046868  
Accuracy: 0.5672316384180791, Precision: 0.5865513353561195, Recall: 0.5672316384180791, F1-score: 0.5389567382904445  
Epoch 4/10 (Train): 100%|██████████| 1  
17/117 [00:26<00:00, 4.49sample/s]  
Epoch 4/10 (Eval): 100%|██████████| 1  
71/71 [00:06<00:00, 11.41sample/s]  
Epoch 4/10, Training Loss: 0.6746215471222925, Validation Loss: 0.6717122818453837  
Accuracy: 0.5983050847457627, Precision: 0.6063846017324587, Recall: 0.5983050847457627, F1-score: 0.5893720758478052  
Epoch 5/10 (Train): 100%|██████████| 1  
17/117 [00:25<00:00, 4.51sample/s]  
Epoch 5/10 (Eval): 100%|██████████| 1  
71/71 [00:06<00:00, 11.34sample/s]  
Epoch 5/10, Training Loss: 0.6715045338464649, Validation Loss: 0.6729690339100562  
Accuracy: 0.5644067796610169, Precision: 0.6296980521384089, Recall: 0.5644067796610169, F1-score: 0.4984737987793909  
Epoch 6/10 (Train): 100%|██████████| 1  
17/117 [00:25<00:00, 4.57sample/s]  
Epoch 6/10 (Eval): 100%|██████████| 1  
71/71 [00:06<00:00, 11.09sample/s]  
Epoch 6/10, Training Loss: 0.6656175241476874, Validation Loss: 0.6614054360632169  
Accuracy: 0.6146892655367232, Precision: 0.6360059543128826, Recall: 0.6146892655367232, F1-score: 0.5976537982847187
```

```
Epoch 7/10 (Train): 100%|██████████| 1  
17/117 [00:25<00:00, 4.51sample/s]  
Epoch 7/10 (Eval): 100%|██████████|  
71/71 [00:06<00:00, 11.31sample/s]  
Epoch 7/10, Training Loss: 0.6590304289720417, Validation Loss: 0.6573042546288442  
Accuracy: 0.6344632768361582, Precision: 0.6399504466117477, Recall: 0.6344632768361582, F1-score: 0.630248509530176  
Epoch 8/10 (Train): 100%|██████████| 1  
17/117 [00:25<00:00, 4.55sample/s]  
Epoch 8/10 (Eval): 100%|██████████|  
71/71 [00:06<00:00, 11.37sample/s]  
Epoch 8/10, Training Loss: 0.6572266076018011, Validation Loss: 0.6533190341992566  
Accuracy: 0.6265536723163841, Precision: 0.6576477302588359, Recall: 0.6265536723163841, F1-score: 0.6058918896821252  
Epoch 9/10 (Train): 100%|██████████| 1  
17/117 [00:24<00:00, 4.74sample/s]  
Epoch 9/10 (Eval): 100%|██████████|  
71/71 [00:06<00:00, 11.64sample/s]  
Epoch 9/10, Training Loss: 0.655975492585596, Validation Loss: 0.6439672238745932  
Accuracy: 0.6502824858757063, Precision: 0.651849205069179, Recall: 0.6502824858757063, F1-score: 0.649097756376515  
Epoch 10/10 (Train): 100%|██████████| 1  
17/117 [00:24<00:00, 4.77sample/s]  
Epoch 10/10 (Eval): 100%|██████████|  
71/71 [00:06<00:00, 10.88sample/s]  
Epoch 10/10, Training Loss: 0.6574577587242401, Validation Loss: 0.6411241639805378  
Accuracy: 0.6593220338983051, Precision: 0.6622381065829434, Recall: 0.6593220338983051, F1-score: 0.6574486027004873  
Тренировка завершена!  
Test: 100%|██████████|  
72/72 [00:07<00:00, 10.26sample/s]  
Test Accuracy: 0.649386845039019  
Precision: 0.653486834028616, Recall: 0.649386845039019, F1-score: 0.6474847960053897  
Accuracy of cats : 72 %  
Accuracy of dogs : 57 %  
  
Class_name: cats  
Train_count: 900  
Test_count: 300  
Valid_count: 300  
Shutil images: 100%|██████████| 150  
0/1500 [00:00<00:00, 1869.10image/s]  
Class_name: dogs  
Train_count: 900  
Test_count: 300  
Valid_count: 300  
Shutil images: 100%|██████████| 150  
0/1500 [00:00<00:00, 1840.58image/s]
```

-----  
Выбранная модель: densenet201  
Пользовательское название модели: densenet201\_Exp1  
Выбранный оптимизатор: SGD  
-----

```
Epoch 1/10 (Train): 100%|██████████| 1  
17/117 [00:31<00:00, 3.69sample/s]  
Epoch 1/10 (Eval): 100%|██████████| 1  
71/71 [00:07<00:00, 9.77sample/s]  
Epoch 1/10, Training Loss: 0.6962270773666374, Validation Loss: 0.6901366503561958  
Accuracy: 0.5463276836158192, Precision: 0.5462789870230613, Recall: 0.5463276836158192, F1-score: 0.5462110667208064  
Epoch 2/10 (Train): 100%|██████████| 1  
17/117 [00:30<00:00, 3.87sample/s]  
Epoch 2/10 (Eval): 100%|██████████| 1  
71/71 [00:07<00:00, 9.87sample/s]  
Epoch 2/10, Training Loss: 0.687650529855404, Validation Loss: 0.6826642500815419  
Accuracy: 0.5468926553672316, Precision: 0.5886456109161917, Recall: 0.5468926553672316, F1-score: 0.48194034485822995  
Epoch 3/10 (Train): 100%|██████████| 1  
17/117 [00:30<00:00, 3.84sample/s]  
Epoch 3/10 (Eval): 100%|██████████| 1  
71/71 [00:06<00:00, 10.15sample/s]  
Epoch 3/10, Training Loss: 0.6735788353139852, Validation Loss: 0.6752971496622441  
Accuracy: 0.5932203389830508, Precision: 0.5932528860233163, Recall: 0.5932203389830508, F1-score: 0.5932244939243614  
Epoch 4/10 (Train): 100%|██████████| 1  
17/117 [00:29<00:00, 3.92sample/s]  
Epoch 4/10 (Eval): 100%|██████████| 1  
71/71 [00:06<00:00, 10.17sample/s]  
Epoch 4/10, Training Loss: 0.6685741442658462, Validation Loss: 0.6680206398842699  
Accuracy: 0.619774011299435, Precision: 0.6197604696307839, Recall: 0.619774011299435, F1-score: 0.6197433006412335  
Epoch 5/10 (Train): 100%|██████████| 1  
17/117 [00:29<00:00, 3.93sample/s]  
Epoch 5/10 (Eval): 100%|██████████| 1  
71/71 [00:06<00:00, 10.18sample/s]  
Epoch 5/10, Training Loss: 0.6666093120393564, Validation Loss: 0.6615318674488929  
Accuracy: 0.6067796610169491, Precision: 0.6163798499970471, Recall: 0.6067796610169491, F1-score: 0.5974063558773091  
Epoch 6/10 (Train): 100%|██████████| 1  
17/117 [00:29<00:00, 3.90sample/s]  
Epoch 6/10 (Eval): 100%|██████████| 1  
71/71 [00:07<00:00, 10.13sample/s]  
Epoch 6/10, Training Loss: 0.6608455751430833, Validation Loss: 0.6555790710920668  
Accuracy: 0.6333333333333333, Precision: 0.6333230302349107, Recall: 0.6333333333333333, F1-score: 0.6333037178546219
```

```
Epoch 7/10 (Train): 100%|██████████| 1  
17/117 [00:29<00:00, 3.92sample/s]  
Epoch 7/10 (Eval): 100%|██████████|  
71/71 [00:06<00:00, 10.17sample/s]  
Epoch 7/10, Training Loss: 0.6569069029330553, Validation Loss: 0.6525533394624958  
Accuracy: 0.631638418079096, Precision: 0.6321123290689631, Recall: 0.631638418079096, F1-score: 0.6310980235122406  
Epoch 8/10 (Train): 100%|██████████| 1  
17/117 [00:29<00:00, 3.93sample/s]  
Epoch 8/10 (Eval): 100%|██████████|  
71/71 [00:07<00:00, 10.07sample/s]  
Epoch 8/10, Training Loss: 0.6604726020606762, Validation Loss: 0.6477325530880589  
Accuracy: 0.6350282485875707, Precision: 0.6385988116303201, Recall: 0.6350282485875707, F1-score: 0.6321734704726708  
Epoch 9/10 (Train): 100%|██████████| 1  
17/117 [00:30<00:00, 3.83sample/s]  
Epoch 9/10 (Eval): 100%|██████████|  
71/71 [00:06<00:00, 10.19sample/s]  
Epoch 9/10, Training Loss: 0.6550826103087564, Validation Loss: 0.6439938762430417  
Accuracy: 0.6440677966101694, Precision: 0.6451657197125229, Recall: 0.6440677966101694, F1-score: 0.6436060397408563  
Epoch 10/10 (Train): 100%|██████████| 1  
17/117 [00:29<00:00, 4.01sample/s]  
Epoch 10/10 (Eval): 100%|██████████|  
71/71 [00:07<00:00, 9.83sample/s]  
Epoch 10/10, Training Loss: 0.64849885268682, Validation Loss: 0.6392841962097728  
Accuracy: 0.6632768361581921, Precision: 0.6644789360803275, Recall: 0.6632768361581921, F1-score: 0.6624460394309507  
Тренировка завершена!  
Test: 100%|██████████|  
72/72 [00:07<00:00, 9.40sample/s]  
Test Accuracy: 0.6538461538461539  
Precision: 0.6557979051829502, Recall: 0.6538461538461539, F1-score: 0.6530544234849235  
Accuracy of cats : 70 %  
Accuracy of dogs : 60 %  
  
Class_name: cats  
Train_count: 900  
Test_count: 300  
Valid_count: 300  
Shutil images: 100%|██████████| 150  
0/1500 [00:00<00:00, 1733.13image/s]  
Class_name: dogs  
Train_count: 900  
Test_count: 300  
Valid_count: 300  
Shutil images: 100%|██████████| 150  
0/1500 [00:00<00:00, 1693.41image/s]
```

-----  
Выбранная модель: efficientnet\_b0  
Пользовательское название модели: efficientnet\_b0\_Exp1  
Выбранный оптимизатор: AdamW  
-----

```
Epoch 1/10 (Train): 100%|██████████| 1  
17/117 [00:15<00:00, 7.59sample/s]  
Epoch 1/10 (Eval): 100%|██████████| 1  
71/71 [00:03<00:00, 19.09sample/s]  
Epoch 1/10, Training Loss: 0.7302487659037644, Validation Loss: 1.2924524341936166  
Accuracy: 0.5372881355932203, Precision: 0.5564912953447351, Recall: 0.5372881355932  
203, F1-score: 0.4887176826653732  
Epoch 2/10 (Train): 100%|██████████| 1  
17/117 [00:15<00:00, 7.68sample/s]  
Epoch 2/10 (Eval): 100%|██████████| 1  
71/71 [00:03<00:00, 18.86sample/s]  
Epoch 2/10, Training Loss: 0.6953547653512975, Validation Loss: 1.6737568551032556  
Accuracy: 0.5706214689265536, Precision: 0.5923514680011971, Recall: 0.5706214689265  
536, F1-score: 0.5411821488149751  
Epoch 3/10 (Train): 100%|██████████| 1  
17/117 [00:15<00:00, 7.53sample/s]  
Epoch 3/10 (Eval): 100%|██████████| 1  
71/71 [00:03<00:00, 19.29sample/s]  
Epoch 3/10, Training Loss: 0.6902665245851644, Validation Loss: 0.6819961663693358  
Accuracy: 0.6203389830508474, Precision: 0.6203252586726002, Recall: 0.6203389830508  
474, F1-score: 0.620312318194159  
Epoch 4/10 (Train): 100%|██████████| 1  
17/117 [00:15<00:00, 7.48sample/s]  
Epoch 4/10 (Eval): 100%|██████████| 1  
71/71 [00:03<00:00, 19.21sample/s]  
Epoch 4/10, Training Loss: 0.6956392032917106, Validation Loss: 0.8912628924442549  
Accuracy: 0.615819209039548, Precision: 0.6185886122726348, Recall: 0.61581920903954  
8, F1-score: 0.6140504453592053  
Epoch 5/10 (Train): 100%|██████████| 1  
17/117 [00:16<00:00, 7.31sample/s]  
Epoch 5/10 (Eval): 100%|██████████| 1  
71/71 [00:03<00:00, 19.33sample/s]  
Epoch 5/10, Training Loss: 0.6708097875199962, Validation Loss: 0.6352225489872324  
Accuracy: 0.6502824858757063, Precision: 0.6773930349925192, Recall: 0.650282485875  
063, F1-score: 0.6354352307485164  
Epoch 6/10 (Train): 100%|██████████| 1  
17/117 [00:14<00:00, 7.88sample/s]  
Epoch 6/10 (Eval): 100%|██████████| 1  
71/71 [00:03<00:00, 20.04sample/s]  
Epoch 6/10, Training Loss: 0.6540639874786445, Validation Loss: 0.6252367301175823  
Accuracy: 0.6508474576271186, Precision: 0.6630283360031842, Recall: 0.6508474576271  
186, F1-score: 0.6448600257324696
```

```
Epoch 7/10 (Train): 100%|██████████| 1  
17/117 [00:15<00:00, 7.73sample/s]  
Epoch 7/10 (Eval): 100%|██████████|  
71/71 [00:03<00:00, 19.82sample/s]  
Epoch 7/10, Training Loss: 0.6542425363377564, Validation Loss: 0.627041901572276  
Accuracy: 0.7225988700564971, Precision: 0.722627671768511, Recall: 0.72259887005649  
71, F1-score: 0.7226019691394634  
Epoch 8/10 (Train): 100%|██████████| 1  
17/117 [00:14<00:00, 7.91sample/s]  
Epoch 8/10 (Eval): 100%|██████████|  
71/71 [00:03<00:00, 19.99sample/s]  
Epoch 8/10, Training Loss: 0.6215585335486551, Validation Loss: 0.5982430490565165  
Accuracy: 0.752542372881356, Precision: 0.7533134305702754, Recall: 0.75254237288135  
6, F1-score: 0.7524187919855952  
Epoch 9/10 (Train): 100%|██████████| 1  
17/117 [00:14<00:00, 7.98sample/s]  
Epoch 9/10 (Eval): 100%|██████████|  
71/71 [00:03<00:00, 20.27sample/s]  
Epoch 9/10, Training Loss: 0.6095031294269542, Validation Loss: 0.5472446328165841  
Accuracy: 0.7779661016949152, Precision: 0.785184827686229, Recall: 0.77796610169491  
52, F1-score: 0.7763830913275211  
Epoch 10/10 (Train): 100%|██████████| 1  
17/117 [00:14<00:00, 7.82sample/s]  
Epoch 10/10 (Eval): 100%|██████████|  
71/71 [00:03<00:00, 20.08sample/s]  
Epoch 10/10, Training Loss: 0.5991643061369882, Validation Loss: 0.5181674186961126  
Accuracy: 0.7542372881355932, Precision: 0.7628695729355455, Recall: 0.7542372881355  
932, F1-score: 0.7519775331635382  
Тренировка завершена!  
Test: 100%|██████████|  
72/72 [00:04<00:00, 17.92sample/s]  
Test Accuracy: 0.7603121516164995  
Precision: 0.769412310122298, Recall: 0.7603121516164995, F1-score: 0.75851434203635  
36  
Accuracy of cats : 84 %  
Accuracy of dogs : 67 %  
  
Class_name: cats  
Train_count: 900  
Test_count: 300  
Valid_count: 300  
Shutil images: 100%|██████████| 150  
0/1500 [00:00<00:00, 1870.08image/s]  
Class_name: dogs  
Train_count: 900  
Test_count: 300  
Valid_count: 300  
Shutil images: 100%|██████████| 150  
0/1500 [00:00<00:00, 1839.51image/s]
```

-----  
Выбранная модель: efficientnet\_b1  
Пользовательское название модели: efficientnet\_b1\_Exp1  
Выбранный оптимизатор: AdamW  
-----

```
Epoch 1/10 (Train): 100%|██████████| 1  
17/117 [00:19<00:00, 5.94sample/s]  
Epoch 1/10 (Eval): 100%|██████████| 1  
71/71 [00:03<00:00, 17.89sample/s]  
Epoch 1/10, Training Loss: 0.7369038601743595, Validation Loss: 0.7294729466492174  
Accuracy: 0.4966101694915254, Precision: 0.49831467137050384, Recall: 0.496610169491  
5254, F1-score: 0.3305748845483462  
Epoch 2/10 (Train): 100%|██████████| 1  
17/117 [00:19<00:00, 5.99sample/s]  
Epoch 2/10 (Eval): 100%|██████████| 1  
71/71 [00:03<00:00, 17.89sample/s]  
Epoch 2/10, Training Loss: 0.7156058897336433, Validation Loss: 0.7011872912194096  
Accuracy: 0.5084745762711864, Precision: 0.5603546645757966, Recall: 0.5084745762711  
864, F1-score: 0.36232771302162675  
Epoch 3/10 (Train): 100%|██████████| 1  
17/117 [00:19<00:00, 5.96sample/s]  
Epoch 3/10 (Eval): 100%|██████████| 1  
71/71 [00:03<00:00, 17.83sample/s]  
Epoch 3/10, Training Loss: 0.7084879818601588, Validation Loss: 0.6906078538652194  
Accuracy: 0.5406779661016949, Precision: 0.6086709247258225, Recall: 0.5406779661016  
949, F1-score: 0.45082145264890233  
Epoch 4/10 (Train): 100%|██████████| 1  
17/117 [00:19<00:00, 6.14sample/s]  
Epoch 4/10 (Eval): 100%|██████████| 1  
71/71 [00:03<00:00, 18.11sample/s]  
Epoch 4/10, Training Loss: 0.7012414730641023, Validation Loss: 0.6960913299840722  
Accuracy: 0.492090395480226, Precision: 0.48074454565203384, Recall: 0.4920903954802  
26, F1-score: 0.3773275477668832  
Epoch 5/10 (Train): 100%|██████████| 1  
17/117 [00:19<00:00, 6.04sample/s]  
Epoch 5/10 (Eval): 100%|██████████| 1  
71/71 [00:03<00:00, 18.11sample/s]  
Epoch 5/10, Training Loss: 0.7009011016388802, Validation Loss: 0.704486798263539  
Accuracy: 0.4966101694915254, Precision: 0.2466216604424016, Recall: 0.4966101694915  
254, F1-score: 0.329573679866403  
Epoch 6/10 (Train): 100%|██████████| 1  
17/117 [00:19<00:00, 5.96sample/s]  
Epoch 6/10 (Eval): 100%|██████████| 1  
71/71 [00:03<00:00, 17.79sample/s]  
Epoch 00006: reducing learning rate of group 0 to 1.0000e-04.  
Epoch 6/10, Training Loss: 0.7033013548035586, Validation Loss: 0.6919969470150726  
Accuracy: 0.5141242937853108, Precision: 0.5321562504006758, Recall: 0.5141242937853  
108, F1-score: 0.420024599096479
```

```
Epoch 7/10 (Train): 100%|██████████| 1  
17/117 [00:19<00:00, 6.07sample/s]  
Epoch 7/10 (Eval): 100%|██████████|  
71/71 [00:03<00:00, 17.88sample/s]  
Epoch 7/10, Training Loss: 0.6905143075891355, Validation Loss: 0.6902980849904529  
Accuracy: 0.5242937853107345, Precision: 0.5368035621641862, Recall: 0.5242937853107345, F1-score: 0.4712584039965844  
Epoch 8/10 (Train): 100%|██████████| 1  
17/117 [00:19<00:00, 6.06sample/s]  
Epoch 8/10 (Eval): 100%|██████████|  
71/71 [00:03<00:00, 18.02sample/s]  
Epoch 8/10, Training Loss: 0.6876194057315894, Validation Loss: 0.6899287003581807  
Accuracy: 0.5276836158192091, Precision: 0.5670677967852513, Recall: 0.5276836158192091, F1-score: 0.4392434212026283  
Epoch 9/10 (Train): 100%|██████████| 1  
17/117 [00:19<00:00, 5.97sample/s]  
Epoch 9/10 (Eval): 100%|██████████|  
71/71 [00:03<00:00, 17.93sample/s]  
Epoch 9/10, Training Loss: 0.6857665077393148, Validation Loss: 0.6878813170107071  
Accuracy: 0.5338983050847458, Precision: 0.5633490231707454, Recall: 0.5338983050847458, F1-score: 0.4663473471806183  
Epoch 10/10 (Train): 100%|██████████| 1  
17/117 [00:19<00:00, 6.07sample/s]  
Epoch 10/10 (Eval): 100%|██████████|  
71/71 [00:03<00:00, 18.06sample/s]  
Epoch 10/10, Training Loss: 0.6915690825155453, Validation Loss: 0.6899066190261626  
Accuracy: 0.5248587570621469, Precision: 0.5621127262926457, Recall: 0.5248587570621469, F1-score: 0.43314661319745384  
Тренировка завершена!  
Test: 100%|██████████|  
72/72 [00:04<00:00, 17.09sample/s]  
Test Accuracy: 0.5261984392419174  
Precision: 0.5861410600452844, Recall: 0.5261984392419174, F1-score: 0.43346091691649985  
Accuracy of cats : 93 %  
Accuracy of dogs : 12 %  
  
Class_name: cats  
Train_count: 900  
Test_count: 300  
Valid_count: 300  
Shutil images: 100%|██████████| 150  
0/1500 [00:00<00:00, 1816.85image/s]  
Class_name: dogs  
Train_count: 900  
Test_count: 300  
Valid_count: 300  
Shutil images: 100%|██████████| 150  
0/1500 [00:00<00:00, 1910.42image/s]
```

-----  
Выбранная модель: efficientnet\_b2  
Пользовательское название модели: efficientnet\_b2\_Exp1  
Выбранный оптимизатор: AdamW  
-----

```
Epoch 1/10 (Train): 100%|██████████| 1  
17/117 [00:19<00:00, 5.98sample/s]  
Epoch 1/10 (Eval): 100%|██████████| 1  
71/71 [00:04<00:00, 17.61sample/s]  
Epoch 1/10, Training Loss: 0.7594528090390055, Validation Loss: 0.7536237125342848  
Accuracy: 0.5011299435028248, Precision: 0.4597690605160464, Recall: 0.5011299435028248, F1-score: 0.34582875858871664  
Epoch 2/10 (Train): 100%|██████████| 1  
17/117 [00:19<00:00, 6.02sample/s]  
Epoch 2/10 (Eval): 100%|██████████| 1  
71/71 [00:03<00:00, 18.02sample/s]  
Epoch 2/10, Training Loss: 0.7165128451001571, Validation Loss: 0.7176835713750225  
Accuracy: 0.511864406779661, Precision: 0.5523851562655411, Recall: 0.511864406779661, F1-score: 0.38286466300284355  
Epoch 3/10 (Train): 100%|██████████| 1  
17/117 [00:19<00:00, 6.08sample/s]  
Epoch 3/10 (Eval): 100%|██████████| 1  
71/71 [00:03<00:00, 17.81sample/s]  
Epoch 3/10, Training Loss: 0.7286718392960416, Validation Loss: 0.7097975998948522  
Accuracy: 0.5225988700564972, Precision: 0.5330626064189501, Recall: 0.5225988700564972, F1-score: 0.472078554916805  
Epoch 4/10 (Train): 100%|██████████| 1  
17/117 [00:19<00:00, 5.94sample/s]  
Epoch 4/10 (Eval): 100%|██████████| 1  
71/71 [00:03<00:00, 17.79sample/s]  
Epoch 4/10, Training Loss: 0.7279319847136675, Validation Loss: 0.8235178642017019  
Accuracy: 0.4937853107344633, Precision: 0.4849328894825805, Recall: 0.4937853107344633, F1-score: 0.4308362319374967  
Epoch 5/10 (Train): 100%|██████████| 1  
17/117 [00:19<00:00, 5.98sample/s]  
Epoch 5/10 (Eval): 100%|██████████| 1  
71/71 [00:04<00:00, 17.73sample/s]  
Epoch 5/10, Training Loss: 0.7147913668725979, Validation Loss: 0.9518771129476149  
Accuracy: 0.5683615819209039, Precision: 0.5683851439692897, Recall: 0.5683615819209039, F1-score: 0.5680217617101319  
Epoch 6/10 (Train): 100%|██████████| 1  
17/117 [00:19<00:00, 5.95sample/s]  
Epoch 6/10 (Eval): 100%|██████████| 1  
71/71 [00:04<00:00, 17.73sample/s]  
Epoch 6/10, Training Loss: 0.7086800028192743, Validation Loss: 0.6899365390424674  
Accuracy: 0.5073446327683616, Precision: 0.5451594292437616, Recall: 0.5073446327683616, F1-score: 0.361759494169334
```

```
Epoch 7/10 (Train): 100%|██████████| 1  
17/117 [00:19<00:00, 6.05sample/s]  
Epoch 7/10 (Eval): 100%|██████████|  
71/71 [00:04<00:00, 17.74sample/s]  
Epoch 7/10, Training Loss: 0.6905410349001372, Validation Loss: 0.6953914391118928  
Accuracy: 0.515819209039548, Precision: 0.5279960448457177, Recall: 0.515819209039548, F1-score: 0.4425318359973256  
Epoch 8/10 (Train): 100%|██████████| 1  
17/117 [00:19<00:00, 5.95sample/s]  
Epoch 8/10 (Eval): 100%|██████████|  
71/71 [00:03<00:00, 17.97sample/s]  
Epoch 8/10, Training Loss: 0.701789746470775, Validation Loss: 0.6815600986197844  
Accuracy: 0.5734463276836158, Precision: 0.5767902858213965, Recall: 0.5734463276836158, F1-score: 0.5698051324945624  
Epoch 9/10 (Train): 100%|██████████| 1  
17/117 [00:19<00:00, 6.11sample/s]  
Epoch 9/10 (Eval): 100%|██████████|  
71/71 [00:04<00:00, 17.53sample/s]  
Epoch 9/10, Training Loss: 0.7009077135670095, Validation Loss: 0.6767143038033092  
Accuracy: 0.6112994350282486, Precision: 0.6297559007789527, Recall: 0.6112994350282486, F1-score: 0.5956525902518434  
Тренировка завершена!  
Test: 100%|██████████| 1  
72/72 [00:04<00:00, 17.06sample/s]  
Test Accuracy: 0.6315496098104794  
Precision: 0.6388538858764802, Recall: 0.6315496098104794, F1-score: 0.6273790521789951  
Accuracy of cats : 73 %  
Accuracy of dogs : 52 %  
  
Class_name: cats  
Train_count: 900  
Test_count: 300  
Valid_count: 300  
Shutil images: 100%|██████████| 150  
0/1500 [00:00<00:00, 1902.84image/s]  
Class_name: dogs  
Train_count: 900  
Test_count: 300  
Valid_count: 300  
Shutil images: 100%|██████████| 150  
0/1500 [00:00<00:00, 1888.32image/s]
```

-----  
Выбранная модель: efficientnet\_b3  
Пользовательское название модели: efficientnet\_b3\_Exp1  
Выбранный оптимизатор: AdamW  
-----

```
Epoch 1/10 (Train): 100%|██████████| 1  
17/117 [00:21<00:00, 5.50sample/s]  
Epoch 1/10 (Eval): 100%|██████████| 1  
71/71 [00:04<00:00, 17.08sample/s]  
Epoch 1/10, Training Loss: 0.761479578927578, Validation Loss: 1.0088414379769126  
Accuracy: 0.5011299435028248, Precision: 0.4785934149516058, Recall: 0.5011299435028  
248, F1-score: 0.3550630142088036  
Epoch 2/10 (Train): 100%|██████████| 1  
17/117 [00:21<00:00, 5.43sample/s]  
Epoch 2/10 (Eval): 100%|██████████| 1  
71/71 [00:04<00:00, 16.81sample/s]  
Epoch 2/10, Training Loss: 0.7198541409720943, Validation Loss: 1.0061426218283378  
Accuracy: 0.49491525423728816, Precision: 0.49380757332171815, Recall: 0.49491525423  
728816, F1-score: 0.48784266990263975  
Epoch 3/10 (Train): 100%|██████████| 1  
17/117 [00:21<00:00, 5.44sample/s]  
Epoch 3/10 (Eval): 100%|██████████| 1  
71/71 [00:04<00:00, 16.70sample/s]  
Epoch 3/10, Training Loss: 0.722934346827356, Validation Loss: 0.981686058354243  
Accuracy: 0.5344632768361582, Precision: 0.5541825520902511, Recall: 0.5344632768361  
582, F1-score: 0.4817322903085616  
Epoch 4/10 (Train): 100%|██████████| 1  
17/117 [00:21<00:00, 5.40sample/s]  
Epoch 4/10 (Eval): 100%|██████████| 1  
71/71 [00:04<00:00, 17.01sample/s]  
Epoch 4/10, Training Loss: 0.716695944440945, Validation Loss: 1.0163657370596955  
Accuracy: 0.5214689265536723, Precision: 0.5252511839619142, Recall: 0.5214689265536  
723, F1-score: 0.4944372768864406  
Epoch 5/10 (Train): 100%|██████████| 1  
17/117 [00:21<00:00, 5.38sample/s]  
Epoch 5/10 (Eval): 100%|██████████| 1  
71/71 [00:04<00:00, 16.93sample/s]  
Epoch 5/10, Training Loss: 0.7034830445292226, Validation Loss: 0.7314445288841334  
Accuracy: 0.5468926553672316, Precision: 0.5694093938989824, Recall: 0.5468926553672  
316, F1-score: 0.5025407873265317  
Epoch 6/10 (Train): 100%|██████████| 1  
17/117 [00:21<00:00, 5.40sample/s]  
Epoch 6/10 (Eval): 100%|██████████| 1  
71/71 [00:04<00:00, 17.25sample/s]  
Epoch 6/10, Training Loss: 0.7041551484033782, Validation Loss: 0.7148596223464794  
Accuracy: 0.596045197740113, Precision: 0.5981705381081547, Recall: 0.59604519774011  
3, F1-score: 0.5931651661556684
```

```
Epoch 7/10 (Train): 100%|██████████| 1  
17/117 [00:21<00:00, 5.47sample/s]  
Epoch 7/10 (Eval): 100%|██████████|  
71/71 [00:04<00:00, 17.28sample/s]  
Epoch 7/10, Training Loss: 0.7028284017111521, Validation Loss: 0.6835094390615906  
Accuracy: 0.6180790960451977, Precision: 0.6244812534261783, Recall: 0.6180790960451977, F1-score: 0.6138219805990832  
Epoch 8/10 (Train): 100%|██████████| 1  
17/117 [00:21<00:00, 5.38sample/s]  
Epoch 8/10 (Eval): 100%|██████████|  
71/71 [00:04<00:00, 17.39sample/s]  
Epoch 8/10, Training Loss: 0.682530328212657, Validation Loss: 0.7085619690054554  
Accuracy: 0.615819209039548, Precision: 0.6239701467423727, Recall: 0.615819209039548, F1-score: 0.6084983252025784  
Epoch 9/10 (Train): 100%|██████████| 1  
17/117 [00:21<00:00, 5.54sample/s]  
Epoch 9/10 (Eval): 100%|██████████|  
71/71 [00:04<00:00, 17.09sample/s]  
Epoch 9/10, Training Loss: 0.6817250830658174, Validation Loss: 1.0754199480101214  
Accuracy: 0.6124293785310735, Precision: 0.618759015031251, Recall: 0.6124293785310735, F1-score: 0.6063471150608937  
Epoch 10/10 (Train): 100%|██████████| 1  
17/117 [00:21<00:00, 5.40sample/s]  
Epoch 10/10 (Eval): 100%|██████████|  
71/71 [00:04<00:00, 17.22sample/s]  
Epoch 10/10, Training Loss: 0.6902048052623715, Validation Loss: 0.6689960503645536  
Accuracy: 0.6022598870056497, Precision: 0.6525499910350361, Recall: 0.6022598870056497, F1-score: 0.5646106662478924  
Тренировка завершена!  
Test: 100%|██████████|  
72/72 [00:04<00:00, 15.94sample/s]  
Test Accuracy: 0.5875139353400223  
Precision: 0.6425614808306408, Recall: 0.5875139353400223, F1-score: 0.546028065725551  
Accuracy of cats : 89 %  
Accuracy of dogs : 28 %  
  
Class_name: cats  
Train_count: 900  
Test_count: 300  
Valid_count: 300  
Shutil images: 100%|██████████| 150  
0/1500 [00:00<00:00, 1887.55image/s]  
Class_name: dogs  
Train_count: 900  
Test_count: 300  
Valid_count: 300  
Shutil images: 100%|██████████| 150  
0/1500 [00:00<00:00, 1858.32image/s]
```

-----  
Выбранная модель: efficientnet\_b4  
Пользовательское название модели: efficientnet\_b4\_Exp1  
Выбранный оптимизатор: AdamW  
-----

```
Epoch 1/10 (Train): 100%|██████████| 1  
17/117 [00:24<00:00, 4.75sample/s]  
Epoch 1/10 (Eval): 100%|██████████| 1  
71/71 [00:04<00:00, 15.19sample/s]  
Epoch 1/10, Training Loss: 0.7855204430404308, Validation Loss: 3.706076660567084  
Accuracy: 0.5028248587570622, Precision: 0.4999652873872869, Recall: 0.5028248587570622, F1-score: 0.396463911526946  
Epoch 2/10 (Train): 100%|██████████| 1  
17/117 [00:24<00:00, 4.78sample/s]  
Epoch 2/10 (Eval): 100%|██████████| 1  
71/71 [00:04<00:00, 15.11sample/s]  
Epoch 2/10, Training Loss: 0.728178498391994, Validation Loss: 0.8928614161108847  
Accuracy: 0.5107344632768361, Precision: 0.5370391324777831, Recall: 0.5107344632768361, F1-score: 0.38933855673204415  
Epoch 3/10 (Train): 100%|██████████| 1  
17/117 [00:24<00:00, 4.76sample/s]  
Epoch 3/10 (Eval): 100%|██████████| 1  
71/71 [00:04<00:00, 15.12sample/s]  
Epoch 3/10, Training Loss: 0.7401890469953735, Validation Loss: 0.7170179216875194  
Accuracy: 0.5050847457627119, Precision: 0.5413622189130105, Recall: 0.5050847457627119, F1-score: 0.3486487733782782  
Epoch 4/10 (Train): 100%|██████████| 1  
17/117 [00:24<00:00, 4.73sample/s]  
Epoch 4/10 (Eval): 100%|██████████| 1  
71/71 [00:04<00:00, 15.06sample/s]  
Epoch 4/10, Training Loss: 0.7165879966094937, Validation Loss: 0.6940849839294024  
Accuracy: 0.5062146892655367, Precision: 0.5425097095513438, Recall: 0.5062146892655367, F1-score: 0.35574974487393124  
Epoch 5/10 (Train): 100%|██████████| 1  
17/117 [00:25<00:00, 4.62sample/s]  
Epoch 5/10 (Eval): 100%|██████████| 1  
71/71 [00:04<00:00, 14.99sample/s]  
Epoch 5/10, Training Loss: 0.7167060631566704, Validation Loss: 0.689757367817022  
Accuracy: 0.5468926553672316, Precision: 0.5600399425679984, Recall: 0.5468926553672316, F1-score: 0.5167089461566504  
Epoch 6/10 (Train): 100%|██████████| 1  
17/117 [00:24<00:00, 4.84sample/s]  
Epoch 6/10 (Eval): 100%|██████████| 1  
71/71 [00:04<00:00, 15.08sample/s]  
Epoch 6/10, Training Loss: 0.7069652102800817, Validation Loss: 0.7037376438157034  
Accuracy: 0.5265536723163842, Precision: 0.5325191017012889, Recall: 0.5265536723163842, F1-score: 0.4968122481777382
```

```
Epoch 7/10 (Train): 100%|██████████| 1  
17/117 [00:24<00:00, 4.73sample/s]  
Epoch 7/10 (Eval): 100%|██████████|  
71/71 [00:04<00:00, 15.10sample/s]  
Epoch 7/10, Training Loss: 0.7108447139111179, Validation Loss: 0.6942453677371397  
Accuracy: 0.4915254237288136, Precision: 0.44430032507881617, Recall: 0.491525423728  
8136, F1-score: 0.3434271196969469  
Epoch 8/10 (Train): 100%|██████████| 1  
17/117 [00:24<00:00, 4.75sample/s]  
Epoch 8/10 (Eval): 100%|██████████|  
71/71 [00:04<00:00, 15.05sample/s]  
Epoch 00008: reducing learning rate of group 0 to 1.0000e-04.  
  
Epoch 8/10, Training Loss: 0.7109383242517566, Validation Loss: 0.6942074303909883  
Accuracy: 0.5361581920903955, Precision: 0.5425834649958152, Recall: 0.5361581920903  
955, F1-score: 0.5133435047534619  
Epoch 9/10 (Train): 100%|██████████| 1  
17/117 [00:25<00:00, 4.64sample/s]  
Epoch 9/10 (Eval): 100%|██████████|  
71/71 [00:04<00:00, 15.06sample/s]  
Epoch 9/10, Training Loss: 0.6977846908642872, Validation Loss: 0.7120254491008607  
Accuracy: 0.5135593220338983, Precision: 0.514987134829954, Recall: 0.51355932203389  
83, F1-score: 0.5080780090336136  
Epoch 10/10 (Train): 100%|██████████| 1  
17/117 [00:25<00:00, 4.67sample/s]  
Epoch 10/10 (Eval): 100%|██████████|  
71/71 [00:04<00:00, 15.02sample/s]  
Epoch 10/10, Training Loss: 0.6982577239674522, Validation Loss: 0.6918550062987764  
Accuracy: 0.535593220338983, Precision: 0.5363615163218618, Recall: 0.5355932203389  
83, F1-score: 0.5343951515066336  
Тренировка завершена!  
  
Test: 100%|██████████|  
72/72 [00:05<00:00, 13.83sample/s]  
Test Accuracy: 0.5412486064659978  
Precision: 0.5412170700776759, Recall: 0.5412486064659978, F1-score: 0.5404305367846  
98  
Accuracy of cats : 49 %  
Accuracy of dogs : 58 %  
  
Class_name: cats  
Train_count: 900  
Test_count: 300  
Valid_count: 300  
  
Shutil images: 100%|██████████| 150  
0/1500 [00:00<00:00, 1835.50image/s]  
Class_name: dogs  
Train_count: 900  
Test_count: 300  
Valid_count: 300  
  
Shutil images: 100%|██████████| 150  
0/1500 [00:00<00:00, 1858.92image/s]
```

-----  
Выбранная модель: efficientnet\_v2\_s  
Пользовательское название модели: efficientnet\_v2\_s\_Exp1  
Выбранный оптимизатор: AdamW  
-----

```
Epoch 1/10 (Train): 100%|██████████| 1  
17/117 [00:27<00:00, 4.19sample/s]  
Epoch 1/10 (Eval): 100%|██████████| 1  
71/71 [00:05<00:00, 13.44sample/s]  
Epoch 1/10, Training Loss: 0.7410645055149907, Validation Loss: 1.4679833450223092  
Accuracy: 0.5073446327683616, Precision: 0.5149300364159511, Recall: 0.5073446327683  
616, F1-score: 0.402639610728625  
Epoch 2/10 (Train): 100%|██████████| 1  
17/117 [00:27<00:00, 4.19sample/s]  
Epoch 2/10 (Eval): 100%|██████████| 1  
71/71 [00:05<00:00, 13.44sample/s]  
Epoch 2/10, Training Loss: 0.7324830469527908, Validation Loss: 0.7190983527797764  
Accuracy: 0.523728813559322, Precision: 0.5956232986985837, Recall: 0.5237288135593  
2, F1-score: 0.4195343589558144  
Epoch 3/10 (Train): 100%|██████████| 1  
17/117 [00:27<00:00, 4.25sample/s]  
Epoch 3/10 (Eval): 100%|██████████| 1  
71/71 [00:05<00:00, 13.46sample/s]  
Epoch 3/10, Training Loss: 0.709241316835712, Validation Loss: 0.6946007075619562  
Accuracy: 0.5033898305084745, Precision: 0.25340132145935074, Recall: 0.503389830508  
4745, F1-score: 0.3371066057745591  
Epoch 4/10 (Train): 100%|██████████| 1  
17/117 [00:27<00:00, 4.21sample/s]  
Epoch 4/10 (Eval): 100%|██████████| 1  
71/71 [00:05<00:00, 13.74sample/s]  
Epoch 4/10, Training Loss: 0.7223429033166338, Validation Loss: 0.6976409839034754  
Accuracy: 0.49887005649717514, Precision: 0.6247200792627792, Recall: 0.498870056497  
17514, F1-score: 0.3365391854176434  
Epoch 5/10 (Train): 100%|██████████| 1  
17/117 [00:28<00:00, 4.18sample/s]  
Epoch 5/10 (Eval): 100%|██████████| 1  
71/71 [00:05<00:00, 13.62sample/s]  
Epoch 5/10, Training Loss: 0.70222820622452, Validation Loss: 0.7697254173499716  
Accuracy: 0.5022598870056497, Precision: 0.25311852902829973, Recall: 0.502259887005  
6497, F1-score: 0.3366029028371823  
Epoch 6/10 (Train): 100%|██████████| 1  
17/117 [00:27<00:00, 4.29sample/s]  
Epoch 6/10 (Eval): 100%|██████████| 1  
71/71 [00:05<00:00, 13.62sample/s]  
Epoch 00006: reducing learning rate of group 0 to 1.0000e-04.  
Epoch 6/10, Training Loss: 0.7115756432188137, Validation Loss: 0.6974032785596147  
Accuracy: 0.5073446327683616, Precision: 0.5879626426841924, Recall: 0.5073446327683  
616, F1-score: 0.3690467283130258
```

```
Epoch 7/10 (Train): 100%|██████████| 1  
17/117 [00:27<00:00, 4.28sample/s]  
Epoch 7/10 (Eval): 100%|██████████|  
71/71 [00:05<00:00, 13.82sample/s]  
Epoch 7/10, Training Loss: 0.6972701803227661, Validation Loss: 0.6925158586542485  
Accuracy: 0.5169491525423728, Precision: 0.5874839380774644, Recall: 0.5169491525423  
728, F1-score: 0.402070631654607  
Epoch 8/10 (Train): 100%|██████████| 1  
17/117 [00:28<00:00, 4.16sample/s]  
Epoch 8/10 (Eval): 100%|██████████|  
71/71 [00:05<00:00, 13.89sample/s]  
Epoch 8/10, Training Loss: 0.6971814286390178, Validation Loss: 0.6903599411417536  
Accuracy: 0.5327683615819209, Precision: 0.5802646210324856, Recall: 0.5327683615819  
209, F1-score: 0.4572743042196972  
Epoch 9/10 (Train): 100%|██████████| 1  
17/117 [00:27<00:00, 4.22sample/s]  
Epoch 9/10 (Eval): 100%|██████████|  
71/71 [00:05<00:00, 13.73sample/s]  
Epoch 9/10, Training Loss: 0.6944277000557976, Validation Loss: 0.6896832152611791  
Accuracy: 0.5288135593220339, Precision: 0.5745314248575611, Recall: 0.5288135593220  
339, F1-score: 0.4497001045482102  
Epoch 10/10 (Train): 100%|██████████| 1  
17/117 [00:27<00:00, 4.24sample/s]  
Epoch 10/10 (Eval): 100%|██████████|  
71/71 [00:05<00:00, 13.74sample/s]  
Epoch 10/10, Training Loss: 0.6855318144913648, Validation Loss: 0.679916870964449  
Accuracy: 0.556497175141243, Precision: 0.5638584233168218, Recall: 0.55649717514124  
3, F1-score: 0.5455435702277788  
Тренировка завершена!  
Test: 100%|██████████|  
72/72 [00:05<00:00, 12.90sample/s]  
Test Accuracy: 0.560200668896321  
Precision: 0.5649566710718458, Recall: 0.560200668896321, F1-score: 0.54969036879368  
74  
Accuracy of cats : 40 %  
Accuracy of dogs : 71 %  
  
Class_name: cats  
Train_count: 900  
Test_count: 300  
Valid_count: 300  
Shutil images: 100%|██████████| 150  
0/1500 [00:00<00:00, 1838.39image/s]  
Class_name: dogs  
Train_count: 900  
Test_count: 300  
Valid_count: 300  
Shutil images: 100%|██████████| 150  
0/1500 [00:00<00:00, 1836.56image/s]
```

-----  
Выбранная модель: mnasnet0\_5  
Пользовательское название модели: mnasnet0\_5\_Exp1  
Выбранный оптимизатор: AdamW  
-----

```
Epoch 1/10 (Train): 100%|██████████| 1  
17/117 [00:11<00:00, 9.81sample/s]  
Epoch 1/10 (Eval): 100%|██████████| 1  
71/71 [00:03<00:00, 21.88sample/s]  
Epoch 1/10, Training Loss: 0.7538466449466938, Validation Loss: 0.693178128051219  
Accuracy: 0.4966101694915254, Precision: 0.2466216604424016, Recall: 0.4966101694915  
254, F1-score: 0.329573679866403  
Epoch 2/10 (Train): 100%|██████████| 1  
17/117 [00:11<00:00, 9.97sample/s]  
Epoch 2/10 (Eval): 100%|██████████| 1  
71/71 [00:03<00:00, 22.80sample/s]  
Epoch 2/10, Training Loss: 0.7228027750483271, Validation Loss: 0.6932709814801727  
Accuracy: 0.4966101694915254, Precision: 0.2466216604424016, Recall: 0.4966101694915  
254, F1-score: 0.329573679866403  
Epoch 3/10 (Train): 100%|██████████| 1  
17/117 [00:11<00:00, 10.10sample/s]  
Epoch 3/10 (Eval): 100%|██████████| 1  
71/71 [00:03<00:00, 23.34sample/s]  
Epoch 3/10, Training Loss: 0.714825640380832, Validation Loss: 0.6931733792111024  
Accuracy: 0.4966101694915254, Precision: 0.2466216604424016, Recall: 0.4966101694915  
254, F1-score: 0.329573679866403  
Epoch 4/10 (Train): 100%|██████████| 1  
17/117 [00:11<00:00, 10.15sample/s]  
Epoch 4/10 (Eval): 100%|██████████| 1  
71/71 [00:03<00:00, 23.14sample/s]  
Epoch 00004: reducing learning rate of group 0 to 1.0000e-04.  
Epoch 4/10, Training Loss: 0.6853132195632862, Validation Loss: 0.6932825106011946  
Accuracy: 0.4966101694915254, Precision: 0.2466216604424016, Recall: 0.4966101694915  
254, F1-score: 0.329573679866403  
Epoch 5/10 (Train): 100%|██████████| 1  
17/117 [00:11<00:00, 10.10sample/s]  
Epoch 5/10 (Eval): 100%|██████████| 1  
71/71 [00:03<00:00, 23.53sample/s]  
Epoch 5/10, Training Loss: 0.6684745921101612, Validation Loss: 0.6931488197402093  
Accuracy: 0.4966101694915254, Precision: 0.2466216604424016, Recall: 0.4966101694915  
254, F1-score: 0.329573679866403  
Epoch 6/10 (Train): 100%|██████████| 1  
17/117 [00:11<00:00, 9.98sample/s]  
Epoch 6/10 (Eval): 100%|██████████| 1  
71/71 [00:03<00:00, 23.44sample/s]  
Epoch 6/10, Training Loss: 0.6598997531768963, Validation Loss: 0.6931817225143735  
Accuracy: 0.4966101694915254, Precision: 0.2466216604424016, Recall: 0.4966101694915  
254, F1-score: 0.329573679866403
```

```
Epoch 7/10 (Train): 100%|██████████| 1  
17/117 [00:11<00:00, 10.11sample/s]  
Epoch 7/10 (Eval): 100%|██████████|  
71/71 [00:03<00:00, 23.54sample/s]  
Epoch 00007: reducing learning rate of group 0 to 1.0000e-05.  
  
Epoch 7/10, Training Loss: 0.6508996698487042, Validation Loss: 0.6931953276954802  
Accuracy: 0.5033898305084745, Precision: 0.25340132145935074, Recall: 0.503389830508  
4745, F1-score: 0.3371066057745591  
  
Epoch 8/10 (Train): 100%|██████████| 1  
17/117 [00:11<00:00, 9.78sample/s]  
Epoch 8/10 (Eval): 100%|██████████|  
71/71 [00:03<00:00, 23.20sample/s]  
Epoch 8/10, Training Loss: 0.6469072058459845, Validation Loss: 0.6932000578460047  
Accuracy: 0.5033898305084745, Precision: 0.25340132145935074, Recall: 0.503389830508  
4745, F1-score: 0.3371066057745591  
  
Epoch 9/10 (Train): 100%|██████████| 1  
17/117 [00:11<00:00, 10.00sample/s]  
Epoch 9/10 (Eval): 100%|██████████|  
71/71 [00:03<00:00, 23.32sample/s]  
Epoch 9/10, Training Loss: 0.6410418623436633, Validation Loss: 0.6932240155457103  
Accuracy: 0.5033898305084745, Precision: 0.25340132145935074, Recall: 0.503389830508  
4745, F1-score: 0.3371066057745591  
  
Epoch 10/10 (Train): 100%|██████████| 1  
17/117 [00:11<00:00, 9.96sample/s]  
Epoch 10/10 (Eval): 100%|██████████|  
71/71 [00:03<00:00, 22.99sample/s]  
Epoch 00010: reducing learning rate of group 0 to 1.0000e-06.  
  
Epoch 10/10, Training Loss: 0.6437242782794097, Validation Loss: 0.6932532509504739  
Accuracy: 0.5033898305084745, Precision: 0.25340132145935074, Recall: 0.503389830508  
4745, F1-score: 0.3371066057745591  
Тренировка завершена!  
  
Test: 100%|██████████|  
72/72 [00:03<00:00, 19.76sample/s]  
Test Accuracy: 0.496098104793757  
Precision: 0.2461133295799575, Recall: 0.496098104793757, F1-score: 0.32900693984086  
715  
Accuracy of cats : 100 %  
Accuracy of dogs : 0 %  
  
Class_name: cats  
Train_count: 900  
Test_count: 300  
Valid_count: 300  
  
Shutil images: 100%|██████████| 150  
0/1500 [00:00<00:00, 1785.44image/s]  
Class_name: dogs  
Train_count: 900  
Test_count: 300  
Valid_count: 300  
  
Shutil images: 100%|██████████| 150  
0/1500 [00:00<00:00, 1804.33image/s]
```

-----  
Выбранная модель: mnasnet0\_75  
Пользовательское название модели: mnasnet0\_75\_Exp1  
Выбранный оптимизатор: AdamW  
-----

```
Epoch 1/10 (Train): 100%|██████████| 1  
17/117 [00:11<00:00, 9.84sample/s]  
Epoch 1/10 (Eval): 100%|██████████| 1  
71/71 [00:03<00:00, 23.17sample/s]  
Epoch 1/10, Training Loss: 0.7704829893102378, Validation Loss: 0.69312587515109  
Accuracy: 0.5033898305084745, Precision: 0.25340132145935074, Recall: 0.503389830508  
4745, F1-score: 0.3371066057745591  
Epoch 2/10 (Train): 100%|██████████| 1  
17/117 [00:11<00:00, 9.77sample/s]  
Epoch 2/10 (Eval): 100%|██████████| 1  
71/71 [00:03<00:00, 23.15sample/s]  
Epoch 2/10, Training Loss: 0.7081687800111307, Validation Loss: 0.6931499135022783  
Accuracy: 0.5033898305084745, Precision: 0.25340132145935074, Recall: 0.503389830508  
4745, F1-score: 0.3371066057745591  
Epoch 3/10 (Train): 100%|██████████| 1  
17/117 [00:12<00:00, 9.72sample/s]  
Epoch 3/10 (Eval): 100%|██████████| 1  
71/71 [00:03<00:00, 22.89sample/s]  
Epoch 3/10, Training Loss: 0.694996511940273, Validation Loss: 0.6931948082595222  
Accuracy: 0.5033898305084745, Precision: 0.25340132145935074, Recall: 0.503389830508  
4745, F1-score: 0.3371066057745591  
Epoch 4/10 (Train): 100%|██████████| 1  
17/117 [00:11<00:00, 9.88sample/s]  
Epoch 4/10 (Eval): 100%|██████████| 1  
71/71 [00:03<00:00, 23.19sample/s]  
Epoch 00004: reducing learning rate of group 0 to 1.0000e-04.  
Epoch 4/10, Training Loss: 0.6745490987796012, Validation Loss: 0.6936638784610619  
Accuracy: 0.5033898305084745, Precision: 0.25340132145935074, Recall: 0.503389830508  
4745, F1-score: 0.3371066057745591  
Epoch 5/10 (Train): 100%|██████████| 1  
17/117 [00:11<00:00, 9.88sample/s]  
Epoch 5/10 (Eval): 100%|██████████| 1  
71/71 [00:03<00:00, 23.17sample/s]  
Epoch 5/10, Training Loss: 0.6476706291119312, Validation Loss: 0.6942690058616595  
Accuracy: 0.5033898305084745, Precision: 0.25340132145935074, Recall: 0.503389830508  
4745, F1-score: 0.3371066057745591  
Epoch 6/10 (Train): 100%|██████████| 1  
17/117 [00:12<00:00, 9.68sample/s]  
Epoch 6/10 (Eval): 100%|██████████| 1  
71/71 [00:03<00:00, 22.77sample/s]  
Epoch 6/10, Training Loss: 0.6334168520424773, Validation Loss: 0.6949907743324668  
Accuracy: 0.5033898305084745, Precision: 0.25340132145935074, Recall: 0.503389830508  
4745, F1-score: 0.3371066057745591
```

```
Epoch 7/10 (Train): 100%|██████████| 1  
17/117 [00:12<00:00, 9.67sample/s]  
Epoch 7/10 (Eval): 100%|██████████|  
71/71 [00:03<00:00, 23.01sample/s]  
Epoch 00007: reducing learning rate of group 0 to 1.0000e-05.  
  
Epoch 7/10, Training Loss: 0.627494360105153, Validation Loss: 0.6948538363653388  
Accuracy: 0.5033898305084745, Precision: 0.25340132145935074, Recall: 0.503389830508  
4745, F1-score: 0.3371066057745591  
  
Epoch 8/10 (Train): 100%|██████████| 1  
17/117 [00:12<00:00, 9.64sample/s]  
Epoch 8/10 (Eval): 100%|██████████|  
71/71 [00:03<00:00, 23.03sample/s]  
Epoch 8/10, Training Loss: 0.6176315389262069, Validation Loss: 0.6953546384633598  
Accuracy: 0.5033898305084745, Precision: 0.25340132145935074, Recall: 0.503389830508  
4745, F1-score: 0.3371066057745591  
  
Epoch 9/10 (Train): 100%|██████████| 1  
17/117 [00:11<00:00, 9.86sample/s]  
Epoch 9/10 (Eval): 100%|██████████|  
71/71 [00:03<00:00, 23.13sample/s]  
Epoch 9/10, Training Loss: 0.6095115223451376, Validation Loss: 0.6960371333663746  
Accuracy: 0.5033898305084745, Precision: 0.25340132145935074, Recall: 0.503389830508  
4745, F1-score: 0.3371066057745591  
  
Epoch 10/10 (Train): 100%|██████████| 1  
17/117 [00:11<00:00, 9.89sample/s]  
Epoch 10/10 (Eval): 100%|██████████|  
71/71 [00:03<00:00, 23.07sample/s]  
Epoch 00010: reducing learning rate of group 0 to 1.0000e-06.  
  
Epoch 10/10, Training Loss: 0.6023872269597096, Validation Loss: 0.6967217984509333  
Accuracy: 0.5033898305084745, Precision: 0.25340132145935074, Recall: 0.503389830508  
4745, F1-score: 0.3371066057745591  
Тренировка завершена!  
  
Test: 100%|██████████|  
72/72 [00:03<00:00, 18.64sample/s]  
Test Accuracy: 0.496098104793757  
Precision: 0.2461133295799575, Recall: 0.496098104793757, F1-score: 0.32900693984086  
715  
Accuracy of cats : 100 %  
Accuracy of dogs : 0 %  
  
Class_name: cats  
Train_count: 900  
Test_count: 300  
Valid_count: 300  
  
Shutil images: 100%|██████████| 150  
0/1500 [00:00<00:00, 1887.59image/s]  
Class_name: dogs  
Train_count: 900  
Test_count: 300  
Valid_count: 300  
  
Shutil images: 100%|██████████| 150  
0/1500 [00:00<00:00, 1873.43image/s]
```

-----  
Выбранная модель: mnasnet1\_0  
Пользовательское название модели: mnasnet1\_0\_Exp1  
Выбранный оптимизатор: AdamW  
-----

```
Epoch 1/10 (Train): 100%|██████████| 1  
17/117 [00:11<00:00, 9.88sample/s]  
Epoch 1/10 (Eval): 100%|██████████| 1  
71/71 [00:03<00:00, 22.38sample/s]  
Epoch 1/10, Training Loss: 0.730597057086789, Validation Loss: 0.6931241710307234  
Accuracy: 0.5033898305084745, Precision: 0.25340132145935074, Recall: 0.5033898305084745, F1-score: 0.3371066057745591  
Epoch 2/10 (Train): 100%|██████████| 1  
17/117 [00:11<00:00, 10.02sample/s]  
Epoch 2/10 (Eval): 100%|██████████| 1  
71/71 [00:03<00:00, 22.57sample/s]  
Epoch 2/10, Training Loss: 0.7057724457395004, Validation Loss: 0.6935586892278854  
Accuracy: 0.5033898305084745, Precision: 0.25340132145935074, Recall: 0.5033898305084745, F1-score: 0.3371066057745591  
Epoch 3/10 (Train): 100%|██████████| 1  
17/117 [00:11<00:00, 9.83sample/s]  
Epoch 3/10 (Eval): 100%|██████████| 1  
71/71 [00:03<00:00, 22.87sample/s]  
Epoch 3/10, Training Loss: 0.6915914481882366, Validation Loss: 0.6937840648290128  
Accuracy: 0.5033898305084745, Precision: 0.25340132145935074, Recall: 0.5033898305084745, F1-score: 0.3371066057745591  
Epoch 4/10 (Train): 100%|██████████| 1  
17/117 [00:11<00:00, 9.92sample/s]  
Epoch 4/10 (Eval): 100%|██████████| 1  
71/71 [00:03<00:00, 22.24sample/s]  
Epoch 00004: reducing learning rate of group 0 to 1.0000e-04.  
Epoch 4/10, Training Loss: 0.6759469727075942, Validation Loss: 0.6935634682070737  
Accuracy: 0.5033898305084745, Precision: 0.25340132145935074, Recall: 0.5033898305084745, F1-score: 0.3371066057745591  
Epoch 5/10 (Train): 100%|██████████| 1  
17/117 [00:11<00:00, 9.90sample/s]  
Epoch 5/10 (Eval): 100%|██████████| 1  
71/71 [00:03<00:00, 22.22sample/s]  
Epoch 5/10, Training Loss: 0.640070489727119, Validation Loss: 0.693854318836988  
Accuracy: 0.5033898305084745, Precision: 0.25340132145935074, Recall: 0.5033898305084745, F1-score: 0.3371066057745591  
Epoch 6/10 (Train): 100%|██████████| 1  
17/117 [00:11<00:00, 9.89sample/s]  
Epoch 6/10 (Eval): 100%|██████████| 1  
71/71 [00:03<00:00, 22.14sample/s]  
Epoch 6/10, Training Loss: 0.6424570123347785, Validation Loss: 0.6937444445777075  
Accuracy: 0.5033898305084745, Precision: 0.25340132145935074, Recall: 0.5033898305084745, F1-score: 0.3371066057745591
```

```
Epoch 7/10 (Train): 100%|██████████| 1  
17/117 [00:11<00:00, 9.95sample/s]  
Epoch 7/10 (Eval): 100%|██████████|  
71/71 [00:03<00:00, 22.53sample/s]  
Epoch 00007: reducing learning rate of group 0 to 1.0000e-05.
```

```
Epoch 7/10, Training Loss: 0.6183196186120581, Validation Loss: 0.6938161907222985  
Accuracy: 0.5033898305084745, Precision: 0.25340132145935074, Recall: 0.503389830508  
4745, F1-score: 0.3371066057745591
```

```
Epoch 8/10 (Train): 100%|██████████| 1  
17/117 [00:11<00:00, 10.01sample/s]  
Epoch 8/10 (Eval): 100%|██████████|  
71/71 [00:03<00:00, 22.23sample/s]
```

```
Epoch 8/10, Training Loss: 0.618325116854567, Validation Loss: 0.6939219977222594  
Accuracy: 0.5033898305084745, Precision: 0.25340132145935074, Recall: 0.503389830508  
4745, F1-score: 0.3371066057745591
```

```
Epoch 9/10 (Train): 100%|██████████| 1  
17/117 [00:11<00:00, 9.86sample/s]  
Epoch 9/10 (Eval): 100%|██████████|  
71/71 [00:03<00:00, 22.24sample/s]
```

```
Epoch 9/10, Training Loss: 0.60655968799176, Validation Loss: 0.6940649111392134  
Accuracy: 0.5033898305084745, Precision: 0.25340132145935074, Recall: 0.503389830508  
4745, F1-score: 0.3371066057745591
```

```
Epoch 10/10 (Train): 100%|██████████| 1  
17/117 [00:11<00:00, 9.80sample/s]  
Epoch 10/10 (Eval): 100%|██████████|  
71/71 [00:03<00:00, 22.51sample/s]
```

```
Epoch 00010: reducing learning rate of group 0 to 1.0000e-06.
```

```
Epoch 10/10, Training Loss: 0.6051599855820066, Validation Loss: 0.6941952434300029  
Accuracy: 0.5033898305084745, Precision: 0.25340132145935074, Recall: 0.503389830508  
4745, F1-score: 0.3371066057745591
```

```
Тренировка завершена!
```

```
Test: 100%|██████████|  
72/72 [00:03<00:00, 18.65sample/s]  
Test Accuracy: 0.496098104793757  
Precision: 0.2461133295799575, Recall: 0.496098104793757, F1-score: 0.32900693984086  
715  
Accuracy of cats : 100 %  
Accuracy of dogs : 0 %
```

```
Class_name: cats  
Train_count: 900  
Test_count: 300  
Valid_count: 300
```

```
Shutil images: 100%|██████████| 150  
0/1500 [00:00<00:00, 1857.39image/s]
```

```
Class_name: dogs  
Train_count: 900  
Test_count: 300  
Valid_count: 300
```

```
Shutil images: 100%|██████████| 150  
0/1500 [00:00<00:00, 1855.16image/s]
```

-----  
Выбранная модель: mnasnet1\_3  
Пользовательское название модели: mnasnet1\_3\_Exp1  
Выбранный оптимизатор: AdamW  
-----

```
Epoch 1/10 (Train): 100%|██████████| 1  
17/117 [00:11<00:00, 9.86sample/s]  
Epoch 1/10 (Eval): 100%|██████████| 1  
71/71 [00:03<00:00, 20.79sample/s]  
Epoch 1/10, Training Loss: 0.7453707912304861, Validation Loss: 0.6932232014540225  
Accuracy: 0.5033898305084745, Precision: 0.25340132145935074, Recall: 0.503389830508  
4745, F1-score: 0.3371066057745591  
Epoch 2/10 (Train): 100%|██████████| 1  
17/117 [00:11<00:00, 9.87sample/s]  
Epoch 2/10 (Eval): 100%|██████████| 1  
71/71 [00:03<00:00, 20.86sample/s]  
Epoch 2/10, Training Loss: 0.6915337747094401, Validation Loss: 0.6940833863902227  
Accuracy: 0.5033898305084745, Precision: 0.25340132145935074, Recall: 0.503389830508  
4745, F1-score: 0.3371066057745591  
Epoch 3/10 (Train): 100%|██████████| 1  
17/117 [00:11<00:00, 9.85sample/s]  
Epoch 3/10 (Eval): 100%|██████████| 1  
71/71 [00:03<00:00, 21.43sample/s]  
Epoch 3/10, Training Loss: 0.6815066898293982, Validation Loss: 0.694042058482682  
Accuracy: 0.4966101694915254, Precision: 0.2466216604424016, Recall: 0.4966101694915  
254, F1-score: 0.329573679866403  
Epoch 4/10 (Train): 100%|██████████| 1  
17/117 [00:11<00:00, 9.76sample/s]  
Epoch 4/10 (Eval): 100%|██████████| 1  
71/71 [00:03<00:00, 20.82sample/s]  
Epoch 00004: reducing learning rate of group 0 to 1.0000e-04.  
Epoch 4/10, Training Loss: 0.6657367453663376, Validation Loss: 0.697924131727488  
Accuracy: 0.5033898305084745, Precision: 0.25340132145935074, Recall: 0.503389830508  
4745, F1-score: 0.3371066057745591  
Epoch 5/10 (Train): 100%|██████████| 1  
17/117 [00:11<00:00, 9.95sample/s]  
Epoch 5/10 (Eval): 100%|██████████| 1  
71/71 [00:03<00:00, 20.74sample/s]  
Epoch 5/10, Training Loss: 0.6205876866397668, Validation Loss: 0.6961550515587047  
Accuracy: 0.5033898305084745, Precision: 0.25340132145935074, Recall: 0.503389830508  
4745, F1-score: 0.3371066057745591  
Epoch 6/10 (Train): 100%|██████████| 1  
17/117 [00:11<00:00, 9.93sample/s]  
Epoch 6/10 (Eval): 100%|██████████| 1  
71/71 [00:03<00:00, 21.33sample/s]  
Epoch 6/10, Training Loss: 0.6142908531133241, Validation Loss: 0.6981291243922239  
Accuracy: 0.5033898305084745, Precision: 0.25340132145935074, Recall: 0.503389830508  
4745, F1-score: 0.3371066057745591
```

```
Epoch 7/10 (Train): 100%|██████████| 1  
17/117 [00:11<00:00, 9.89sample/s]  
Epoch 7/10 (Eval): 100%|██████████|  
71/71 [00:03<00:00, 21.16sample/s]  
Epoch 00007: reducing learning rate of group 0 to 1.0000e-05.
```

```
Epoch 7/10, Training Loss: 0.5884521437618649, Validation Loss: 0.6997733203704748  
Accuracy: 0.5033898305084745, Precision: 0.25340132145935074, Recall: 0.503389830508  
4745, F1-score: 0.3371066057745591
```

```
Epoch 8/10 (Train): 100%|██████████| 1  
17/117 [00:11<00:00, 9.94sample/s]  
Epoch 8/10 (Eval): 100%|██████████|  
71/71 [00:03<00:00, 20.87sample/s]
```

```
Epoch 8/10, Training Loss: 0.5831934201484514, Validation Loss: 0.6989715863755868  
Accuracy: 0.5033898305084745, Precision: 0.25340132145935074, Recall: 0.503389830508  
4745, F1-score: 0.3371066057745591
```

```
Epoch 9/10 (Train): 100%|██████████| 1  
17/117 [00:11<00:00, 9.93sample/s]  
Epoch 9/10 (Eval): 100%|██████████|  
71/71 [00:03<00:00, 20.93sample/s]
```

```
Epoch 9/10, Training Loss: 0.5614614616607133, Validation Loss: 0.6990238567866848  
Accuracy: 0.5033898305084745, Precision: 0.25340132145935074, Recall: 0.503389830508  
4745, F1-score: 0.3371066057745591
```

```
Epoch 10/10 (Train): 100%|██████████| 1  
17/117 [00:11<00:00, 9.98sample/s]  
Epoch 10/10 (Eval): 100%|██████████|  
71/71 [00:03<00:00, 20.96sample/s]
```

```
Epoch 00010: reducing learning rate of group 0 to 1.0000e-06.
```

```
Epoch 10/10, Training Loss: 0.5635667595044647, Validation Loss: 0.699518591502292  
Accuracy: 0.5033898305084745, Precision: 0.25340132145935074, Recall: 0.503389830508  
4745, F1-score: 0.3371066057745591
```

```
Тренировка завершена!
```

```
Test: 100%|██████████|  
72/72 [00:04<00:00, 17.93sample/s]  
Test Accuracy: 0.496098104793757  
Precision: 0.2461133295799575, Recall: 0.496098104793757, F1-score: 0.32900693984086  
715  
Accuracy of cats : 100 %  
Accuracy of dogs : 0 %
```

```
Class_name: cats  
Train_count: 900  
Test_count: 300  
Valid_count: 300
```

```
Shutil images: 100%|██████████| 150  
0/1500 [00:00<00:00, 1862.77image/s]
```

```
Class_name: dogs  
Train_count: 900  
Test_count: 300  
Valid_count: 300
```

```
Shutil images: 100%|██████████| 150  
0/1500 [00:00<00:00, 1847.63image/s]
```

-----  
Выбранная модель: mobilenet\_v2  
Пользовательское название модели: mobilenet\_v2\_Exp1  
Выбранный оптимизатор: AdamW  
-----

```
Epoch 1/10 (Train): 100%|██████████| 1  
17/117 [00:11<00:00, 9.81sample/s]  
Epoch 1/10 (Eval): 100%|██████████| 1  
71/71 [00:03<00:00, 21.34sample/s]  
Epoch 1/10, Training Loss: 0.7600353945192202, Validation Loss: 0.7403636079723552  
Accuracy: 0.5186440677966102, Precision: 0.5409615221086423, Recall: 0.5186440677966  
102, F1-score: 0.431526463088781  
Epoch 2/10 (Train): 100%|██████████| 1  
17/117 [00:11<00:00, 9.83sample/s]  
Epoch 2/10 (Eval): 100%|██████████| 1  
71/71 [00:03<00:00, 21.82sample/s]  
Epoch 2/10, Training Loss: 0.7087958742078646, Validation Loss: 0.6902601176736045  
Accuracy: 0.5338983050847458, Precision: 0.5492186160905765, Recall: 0.5338983050847  
458, F1-score: 0.4884642001314506  
Epoch 3/10 (Train): 100%|██████████| 1  
17/117 [00:11<00:00, 9.85sample/s]  
Epoch 3/10 (Eval): 100%|██████████| 1  
71/71 [00:03<00:00, 21.26sample/s]  
Epoch 3/10, Training Loss: 0.7065067168904788, Validation Loss: 0.6746870425798125  
Accuracy: 0.5745762711864407, Precision: 0.6229106350832365, Recall: 0.5745762711864  
407, F1-score: 0.530841694138255  
Epoch 4/10 (Train): 100%|██████████| 1  
17/117 [00:11<00:00, 9.84sample/s]  
Epoch 4/10 (Eval): 100%|██████████| 1  
71/71 [00:03<00:00, 21.43sample/s]  
Epoch 4/10, Training Loss: 0.6858758113823826, Validation Loss: 0.6375473069269105  
Accuracy: 0.6429378531073446, Precision: 0.675030343313494, Recall: 0.64293785310734  
46, F1-score: 0.6246936441720172  
Epoch 5/10 (Train): 100%|██████████| 1  
17/117 [00:11<00:00, 9.83sample/s]  
Epoch 5/10 (Eval): 100%|██████████| 1  
71/71 [00:03<00:00, 21.54sample/s]  
Epoch 5/10, Training Loss: 0.6720624514194774, Validation Loss: 0.6069531192382177  
Accuracy: 0.6875706214689266, Precision: 0.6876115608863792, Recall: 0.6875706214689  
266, F1-score: 0.6875733140596424  
Epoch 6/10 (Train): 100%|██████████| 1  
17/117 [00:11<00:00, 9.95sample/s]  
Epoch 6/10 (Eval): 100%|██████████| 1  
71/71 [00:03<00:00, 21.35sample/s]  
Epoch 6/10, Training Loss: 0.6720092469613138, Validation Loss: 0.6364144651734897  
Accuracy: 0.619774011299435, Precision: 0.7078290095699298, Recall: 0.61977401129943  
5, F1-score: 0.573033005850249
```

```
Epoch 7/10 (Train): 100%|██████████| 1  
17/117 [00:11<00:00, 9.94sample/s]  
Epoch 7/10 (Eval): 100%|██████████|  
71/71 [00:03<00:00, 21.86sample/s]  
Epoch 7/10, Training Loss: 0.6465116708939659, Validation Loss: 0.5953923852766975  
Accuracy: 0.6977401129943502, Precision: 0.709179475494856, Recall: 0.69774011299435  
02, F1-score: 0.6931272535508498  
Epoch 8/10 (Train): 100%|██████████| 1  
17/117 [00:11<00:00, 9.86sample/s]  
Epoch 8/10 (Eval): 100%|██████████|  
71/71 [00:03<00:00, 20.59sample/s]  
Epoch 8/10, Training Loss: 0.6548008309438508, Validation Loss: 0.6229776777116592  
Accuracy: 0.6937853107344633, Precision: 0.7083461643868652, Recall: 0.6937853107344  
633, F1-score: 0.6888090600214954  
Epoch 9/10 (Train): 100%|██████████| 1  
17/117 [00:11<00:00, 9.88sample/s]  
Epoch 9/10 (Eval): 100%|██████████|  
71/71 [00:03<00:00, 21.43sample/s]  
Epoch 9/10, Training Loss: 0.6440170015718448, Validation Loss: 0.574197493367276  
Accuracy: 0.7090395480225988, Precision: 0.7137147829148985, Recall: 0.7090395480225  
988, F1-score: 0.7076773941440283  
Epoch 10/10 (Train): 100%|██████████| 1  
17/117 [00:11<00:00, 9.76sample/s]  
Epoch 10/10 (Eval): 100%|██████████|  
71/71 [00:03<00:00, 21.34sample/s]  
Epoch 10/10, Training Loss: 0.6211427168191664, Validation Loss: 0.55404227769981  
Accuracy: 0.7372881355932204, Precision: 0.7376292331233835, Recall: 0.7372881355932  
04, F1-score: 0.7371359884083245  
Тренировка завершена!  
Test: 100%|██████████|  
72/72 [00:04<00:00, 17.89sample/s]  
Test Accuracy: 0.7313266443701226  
Precision: 0.7320438758565849, Recall: 0.7313266443701226, F1-score: 0.7312037234698  
813  
Accuracy of cats : 75 %  
Accuracy of dogs : 70 %  
  
Class_name: cats  
Train_count: 900  
Test_count: 300  
Valid_count: 300  
Shutil images: 100%|██████████| 150  
0/1500 [00:00<00:00, 1882.39image/s]  
Class_name: dogs  
Train_count: 900  
Test_count: 300  
Valid_count: 300  
Shutil images: 100%|██████████| 150  
0/1500 [00:00<00:00, 1798.52image/s]
```

-----  
Выбранная модель: mobilenet\_v3\_large  
Пользовательское название модели: mobilenet\_v3\_large\_Exp1  
Выбранный оптимизатор: AdamW  
-----

```
Epoch 1/10 (Train): 100%|██████████| 1  
17/117 [00:13<00:00, 8.74sample/s]  
Epoch 1/10 (Eval): 100%|██████████| 1  
71/71 [00:03<00:00, 21.90sample/s]  
Epoch 1/10, Training Loss: 0.7205925822421408, Validation Loss: 0.6934744587725838  
Accuracy: 0.4966101694915254, Precision: 0.2466216604424016, Recall: 0.4966101694915  
254, F1-score: 0.329573679866403  
Epoch 2/10 (Train): 100%|██████████| 1  
17/117 [00:13<00:00, 8.81sample/s]  
Epoch 2/10 (Eval): 100%|██████████| 1  
71/71 [00:03<00:00, 21.76sample/s]  
Epoch 2/10, Training Loss: 0.6837483520496374, Validation Loss: 0.6993315132324305  
Accuracy: 0.5033898305084745, Precision: 0.25340132145935074, Recall: 0.503389830508  
4745, F1-score: 0.3371066057745591  
Epoch 3/10 (Train): 100%|██████████| 1  
17/117 [00:13<00:00, 8.82sample/s]  
Epoch 3/10 (Eval): 100%|██████████| 1  
71/71 [00:03<00:00, 21.88sample/s]  
Epoch 3/10, Training Loss: 0.662323766820148, Validation Loss: 0.697016385147127  
Accuracy: 0.4966101694915254, Precision: 0.2466216604424016, Recall: 0.4966101694915  
254, F1-score: 0.329573679866403  
Epoch 4/10 (Train): 100%|██████████| 1  
17/117 [00:13<00:00, 8.77sample/s]  
Epoch 4/10 (Eval): 100%|██████████| 1  
71/71 [00:03<00:00, 21.87sample/s]  
Epoch 4/10, Training Loss: 0.6559018595444167, Validation Loss: 0.6924672840678759  
Accuracy: 0.5033898305084745, Precision: 0.25340132145935074, Recall: 0.503389830508  
4745, F1-score: 0.3371066057745591  
Epoch 5/10 (Train): 100%|██████████| 1  
17/117 [00:13<00:00, 8.65sample/s]  
Epoch 5/10 (Eval): 100%|██████████| 1  
71/71 [00:03<00:00, 21.94sample/s]  
Epoch 5/10, Training Loss: 0.6482937501014464, Validation Loss: 0.6861111486362199  
Accuracy: 0.5480225988700564, Precision: 0.633156017645167, Recall: 0.54802259887005  
64, F1-score: 0.45811291442501256  
Epoch 6/10 (Train): 100%|██████████| 1  
17/117 [00:13<00:00, 8.88sample/s]  
Epoch 6/10 (Eval): 100%|██████████| 1  
71/71 [00:03<00:00, 21.71sample/s]  
Epoch 6/10, Training Loss: 0.6516743396103096, Validation Loss: 0.9679696818361174  
Accuracy: 0.5107344632768361, Precision: 0.5195368625270292, Recall: 0.5107344632768  
361, F1-score: 0.4646231225562106
```

```
Epoch 7/10 (Train): 100%|██████████| 1  
17/117 [00:13<00:00, 8.75sample/s]  
Epoch 7/10 (Eval): 100%|██████████|  
71/71 [00:03<00:00, 21.83sample/s]  
Epoch 7/10, Training Loss: 0.6626004209413848, Validation Loss: 2.2271408907606105  
Accuracy: 0.6231638418079096, Precision: 0.6247441778560423, Recall: 0.6231638418079096, F1-score: 0.6215699741752352  
Epoch 8/10 (Train): 100%|██████████| 1  
17/117 [00:13<00:00, 8.80sample/s]  
Epoch 8/10 (Eval): 100%|██████████|  
71/71 [00:03<00:00, 21.70sample/s]  
Epoch 00008: reducing learning rate of group 0 to 1.0000e-04.  
  
Epoch 8/10, Training Loss: 0.6588137991179989, Validation Loss: 1.111955546305678  
Accuracy: 0.6152542372881356, Precision: 0.6206693930305857, Recall: 0.6152542372881356, F1-score: 0.6101263595662468  
Epoch 9/10 (Train): 100%|██████████| 1  
17/117 [00:13<00:00, 8.66sample/s]  
Epoch 9/10 (Eval): 100%|██████████|  
71/71 [00:03<00:00, 21.68sample/s]  
Epoch 9/10, Training Loss: 0.6388266711017708, Validation Loss: 0.59711696123336  
Accuracy: 0.6841807909604519, Precision: 0.6868547959840448, Recall: 0.6841807909604519, F1-score: 0.6832723372172248  
Epoch 10/10 (Train): 100%|██████████| 1  
17/117 [00:13<00:00, 8.60sample/s]  
Epoch 10/10 (Eval): 100%|██████████|  
71/71 [00:03<00:00, 21.89sample/s]  
Epoch 10/10, Training Loss: 0.6241687655939151, Validation Loss: 0.5839729155019179  
Accuracy: 0.6994350282485876, Precision: 0.699808043142864, Recall: 0.6994350282485876, F1-score: 0.6993632553426676  
Тренировка завершена!  
  
Test: 100%|██████████|  
72/72 [00:04<00:00, 17.77sample/s]  
Test Accuracy: 0.7040133779264214  
Precision: 0.7040157336197755, Recall: 0.7040133779264214, F1-score: 0.7039880823695754  
Accuracy of cats : 69 %  
Accuracy of dogs : 71 %  
  
Class_name: cats  
Train_count: 900  
Test_count: 300  
Valid_count: 300  
  
Shutil images: 100%|██████████| 150  
0/1500 [00:00<00:00, 1864.57image/s]  
Class_name: dogs  
Train_count: 900  
Test_count: 300  
Valid_count: 300  
  
Shutil images: 100%|██████████| 150  
0/1500 [00:00<00:00, 1877.75image/s]
```

-----  
Выбранная модель: mobilenet\_v3\_small  
Пользовательское название модели: mobilenet\_v3\_small\_Exp1  
Выбранный оптимизатор: AdamW  
-----

```
Epoch 1/10 (Train): 100%|██████████| 1  
17/117 [00:12<00:00, 9.71sample/s]  
Epoch 1/10 (Eval): 100%|██████████| 1  
71/71 [00:03<00:00, 22.56sample/s]  
Epoch 1/10, Training Loss: 0.6991711515854122, Validation Loss: 0.6931807498137156  
Accuracy: 0.5033898305084745, Precision: 0.25340132145935074, Recall: 0.503389830508  
4745, F1-score: 0.3371066057745591  
Epoch 2/10 (Train): 100%|██████████| 1  
17/117 [00:11<00:00, 9.88sample/s]  
Epoch 2/10 (Eval): 100%|██████████| 1  
71/71 [00:03<00:00, 22.10sample/s]  
Epoch 2/10, Training Loss: 0.673266191589579, Validation Loss: 0.6931756052930477  
Accuracy: 0.5033898305084745, Precision: 0.25340132145935074, Recall: 0.503389830508  
4745, F1-score: 0.3371066057745591  
Epoch 3/10 (Train): 100%|██████████| 1  
17/117 [00:11<00:00, 9.77sample/s]  
Epoch 3/10 (Eval): 100%|██████████| 1  
71/71 [00:03<00:00, 22.50sample/s]  
Epoch 3/10, Training Loss: 0.6684901582778031, Validation Loss: 0.6929561384653641  
Accuracy: 0.5005649717514125, Precision: 0.46339233203200886, Recall: 0.500564971751  
4125, F1-score: 0.3493076346543163  
Epoch 4/10 (Train): 100%|██████████| 1  
17/117 [00:11<00:00, 9.79sample/s]  
Epoch 4/10 (Eval): 100%|██████████| 1  
71/71 [00:03<00:00, 22.00sample/s]  
Epoch 4/10, Training Loss: 0.6501822334148035, Validation Loss: 0.6919774549492335  
Accuracy: 0.6536723163841808, Precision: 0.6591760030642536, Recall: 0.6536723163841  
808, F1-score: 0.6501756416277868  
Epoch 5/10 (Train): 100%|██████████| 1  
17/117 [00:11<00:00, 9.80sample/s]  
Epoch 5/10 (Eval): 100%|██████████| 1  
71/71 [00:03<00:00, 22.49sample/s]  
Epoch 5/10, Training Loss: 0.6544254887912926, Validation Loss: 0.657251213903481  
Accuracy: 0.6587570621468927, Precision: 0.676808836738773, Recall: 0.65875706214689  
27, F1-score: 0.6490678216754646  
Epoch 6/10 (Train): 100%|██████████| 1  
17/117 [00:11<00:00, 9.75sample/s]  
Epoch 6/10 (Eval): 100%|██████████| 1  
71/71 [00:03<00:00, 22.36sample/s]  
Epoch 6/10, Training Loss: 0.6538840595522999, Validation Loss: 0.6267448608147896  
Accuracy: 0.6661016949152543, Precision: 0.6831556810263947, Recall: 0.6661016949152  
543, F1-score: 0.6574628960540679
```

```
Epoch 7/10 (Train): 100%|██████████| 1  
17/117 [00:11<00:00, 9.89sample/s]  
Epoch 7/10 (Eval): 100%|██████████|  
71/71 [00:03<00:00, 22.53sample/s]  
Epoch 7/10, Training Loss: 0.6418931743741607, Validation Loss: 0.7377062989661922  
Accuracy: 0.6005649717514124, Precision: 0.6638438483024366, Recall: 0.6005649717514  
124, F1-score: 0.555855673870595  
Epoch 8/10 (Train): 100%|██████████| 1  
17/117 [00:11<00:00, 9.87sample/s]  
Epoch 8/10 (Eval): 100%|██████████|  
71/71 [00:03<00:00, 22.16sample/s]  
Epoch 8/10, Training Loss: 0.6336240978417452, Validation Loss: 0.6379429159191369  
Accuracy: 0.6389830508474577, Precision: 0.6472674928616549, Recall: 0.6389830508474  
577, F1-score: 0.6344624384337335  
Epoch 9/10 (Train): 100%|██████████| 1  
17/117 [00:11<00:00, 9.78sample/s]  
Epoch 9/10 (Eval): 100%|██████████|  
71/71 [00:03<00:00, 22.50sample/s]  
Epoch 9/10, Training Loss: 0.6242626571569482, Validation Loss: 0.5882972783624789  
Accuracy: 0.6994350282485876, Precision: 0.7001337976266488, Recall: 0.6994350282485  
876, F1-score: 0.6992691783291256  
Epoch 10/10 (Train): 100%|██████████| 1  
17/117 [00:12<00:00, 9.75sample/s]  
Epoch 10/10 (Eval): 100%|██████████|  
71/71 [00:03<00:00, 22.10sample/s]  
Epoch 10/10, Training Loss: 0.6132323165271607, Validation Loss: 2.9675822852568774  
Accuracy: 0.5587570621468927, Precision: 0.6246825143383421, Recall: 0.5587570621468  
927, F1-score: 0.48804678252081135  
Тренировка завершена!  
Test: 100%|██████████|  
72/72 [00:03<00:00, 20.15sample/s]  
Test Accuracy: 0.5557413600891862  
Precision: 0.6285660379113032, Recall: 0.5557413600891862, F1-score: 0.4864378415803  
054  
Accuracy of cats : 92 %  
Accuracy of dogs : 19 %  
  
Class_name: cats  
Train_count: 900  
Test_count: 300  
Valid_count: 300  
Shutil images: 100%|██████████| 150  
0/1500 [00:00<00:00, 1839.80image/s]  
Class_name: dogs  
Train_count: 900  
Test_count: 300  
Valid_count: 300  
Shutil images: 100%|██████████| 150  
0/1500 [00:00<00:00, 1854.39image/s]
```

-----  
Выбранная модель: regnet\_x\_16gf  
Пользовательское название модели: regnet\_x\_16gf\_Exp1  
Выбранный оптимизатор: SGD  
-----

```
Epoch 1/10 (Train): 100%|██████████| 1  
17/117 [00:15<00:00, 7.63sample/s]  
Epoch 1/10 (Eval): 100%|██████████| 1  
71/71 [00:04<00:00, 16.81sample/s]  
Epoch 1/10, Training Loss: 0.6985365851763751, Validation Loss: 0.7197947101404438  
Accuracy: 0.49265536723163844, Precision: 0.49289278607200143, Recall: 0.49265536723  
163844, F1-score: 0.47228915256395315  
Epoch 2/10 (Train): 100%|██████████| 1  
17/117 [00:15<00:00, 7.66sample/s]  
Epoch 2/10 (Eval): 100%|██████████| 1  
71/71 [00:04<00:00, 16.59sample/s]  
Epoch 2/10, Training Loss: 0.7054226644812094, Validation Loss: 0.7090487193926579  
Accuracy: 0.5067796610169492, Precision: 0.5073889542693694, Recall: 0.5067796610169  
492, F1-score: 0.458300113141216  
Epoch 3/10 (Train): 100%|██████████| 1  
17/117 [00:15<00:00, 7.66sample/s]  
Epoch 3/10 (Eval): 100%|██████████| 1  
71/71 [00:04<00:00, 16.52sample/s]  
Epoch 3/10, Training Loss: 0.706327028046576, Validation Loss: 0.7103262022558579  
Accuracy: 0.5016949152542373, Precision: 0.4985489169683141, Recall: 0.5016949152542  
373, F1-score: 0.42868406244820473  
Epoch 4/10 (Train): 100%|██████████| 1  
17/117 [00:15<00:00, 7.62sample/s]  
Epoch 4/10 (Eval): 100%|██████████| 1  
71/71 [00:04<00:00, 16.61sample/s]  
Epoch 4/10, Training Loss: 0.7073858716334277, Validation Loss: 0.7031229365680177  
Accuracy: 0.5084745762711864, Precision: 0.5093475360777968, Recall: 0.5084745762711  
864, F1-score: 0.47008559094843483  
Epoch 5/10 (Train): 100%|██████████| 1  
17/117 [00:15<00:00, 7.63sample/s]  
Epoch 5/10 (Eval): 100%|██████████| 1  
71/71 [00:04<00:00, 16.55sample/s]  
Epoch 5/10, Training Loss: 0.7015540343469917, Validation Loss: 0.6956144551099357  
Accuracy: 0.5282485875706214, Precision: 0.5361205998846506, Recall: 0.5282485875706  
214, F1-score: 0.5066077921153322  
Epoch 6/10 (Train): 100%|██████████| 1  
17/117 [00:15<00:00, 7.63sample/s]  
Epoch 6/10 (Eval): 100%|██████████| 1  
71/71 [00:04<00:00, 16.36sample/s]  
Epoch 6/10, Training Loss: 0.6998956042499556, Validation Loss: 0.6929968172884257  
Accuracy: 0.5457627118644067, Precision: 0.5457261521905219, Recall: 0.5457627118644  
067, F1-score: 0.5453754643348223
```

```
Epoch 7/10 (Train): 100%|██████████| 1  
17/117 [00:15<00:00, 7.62sample/s]  
Epoch 7/10 (Eval): 100%|██████████|  
71/71 [00:04<00:00, 16.53sample/s]  
Epoch 7/10, Training Loss: 0.7022757271408135, Validation Loss: 0.6917797362400313  
Accuracy: 0.5418079096045197, Precision: 0.5461916647510177, Recall: 0.5418079096045197, F1-score: 0.533311904269573  
Epoch 8/10 (Train): 100%|██████████| 1  
17/117 [00:15<00:00, 7.61sample/s]  
Epoch 8/10 (Eval): 100%|██████████|  
71/71 [00:04<00:00, 16.53sample/s]  
Epoch 8/10, Training Loss: 0.6939816914289434, Validation Loss: 0.6900007916709124  
Accuracy: 0.5265536723163842, Precision: 0.5313311060093253, Recall: 0.5265536723163842, F1-score: 0.5127636778367878  
Epoch 9/10 (Train): 100%|██████████| 1  
17/117 [00:15<00:00, 7.58sample/s]  
Epoch 9/10 (Eval): 100%|██████████|  
71/71 [00:04<00:00, 16.46sample/s]  
Epoch 9/10, Training Loss: 0.6993623643888849, Validation Loss: 0.6863352309512554  
Accuracy: 0.5282485875706214, Precision: 0.5328294944227148, Recall: 0.5282485875706214, F1-score: 0.5157116691596418  
Epoch 10/10 (Train): 100%|██████████| 1  
17/117 [00:15<00:00, 7.59sample/s]  
Epoch 10/10 (Eval): 100%|██████████|  
71/71 [00:04<00:00, 16.50sample/s]  
Epoch 10/10, Training Loss: 0.6949762672574002, Validation Loss: 0.6838328848450871  
Accuracy: 0.53954802259887, Precision: 0.548233995562503, Recall: 0.53954802259887, F1-score: 0.5216118842893972  
Тренировка завершена!  
Test: 100%|██████████|  
72/72 [00:04<00:00, 15.96sample/s]  
Test Accuracy: 0.5418060200668896  
Precision: 0.5464708835283609, Recall: 0.5418060200668896, F1-score: 0.5260436563530511  
Accuracy of cats : 35 %  
Accuracy of dogs : 72 %  
  
Class_name: cats  
Train_count: 900  
Test_count: 300  
Valid_count: 300  
Shutil images: 100%|██████████| 150  
0/1500 [00:00<00:00, 1825.06image/s]  
Class_name: dogs  
Train_count: 900  
Test_count: 300  
Valid_count: 300  
Shutil images: 100%|██████████| 150  
0/1500 [00:00<00:00, 1824.20image/s]
```

-----  
Выбранная модель: regnet\_x\_1\_6gf  
Пользовательское название модели: regnet\_x\_1\_6gf\_Exp1  
Выбранный оптимизатор: SGD  
-----

```
Epoch 1/10 (Train): 100%|██████████| 1  
17/117 [00:12<00:00, 9.12sample/s]  
Epoch 1/10 (Eval): 100%|██████████| 1  
71/71 [00:03<00:00, 19.91sample/s]  
Epoch 1/10, Training Loss: 0.7108634892312364, Validation Loss: 0.7248136998906647  
Accuracy: 0.4807909604519774, Precision: 0.47276768905954364, Recall: 0.480790960451  
9774, F1-score: 0.44801313565933043  
Epoch 2/10 (Train): 100%|██████████| 1  
17/117 [00:13<00:00, 8.88sample/s]  
Epoch 2/10 (Eval): 100%|██████████| 1  
71/71 [00:03<00:00, 19.49sample/s]  
Epoch 2/10, Training Loss: 0.7041629284436446, Validation Loss: 0.741484558514956  
Accuracy: 0.480225988700565, Precision: 0.4803787060186309, Recall: 0.48022598870056  
5, F1-score: 0.47894441719624276  
Epoch 3/10 (Train): 100%|██████████| 1  
17/117 [00:12<00:00, 9.24sample/s]  
Epoch 3/10 (Eval): 100%|██████████| 1  
71/71 [00:03<00:00, 19.90sample/s]  
Epoch 3/10, Training Loss: 0.7086389697807304, Validation Loss: 0.704331950784403  
Accuracy: 0.507909604519774, Precision: 0.5078075966865078, Recall: 0.50790960451977  
4, F1-score: 0.4872613628461467  
Epoch 4/10 (Train): 100%|██████████| 1  
17/117 [00:12<00:00, 9.04sample/s]  
Epoch 4/10 (Eval): 100%|██████████| 1  
71/71 [00:03<00:00, 19.76sample/s]  
Epoch 4/10, Training Loss: 0.7009626116917671, Validation Loss: 0.7139655930847771  
Accuracy: 0.5073446327683616, Precision: 0.5130812690134724, Recall: 0.5073446327683  
616, F1-score: 0.46832079519018704  
Epoch 5/10 (Train): 100%|██████████| 1  
17/117 [00:12<00:00, 9.20sample/s]  
Epoch 5/10 (Eval): 100%|██████████| 1  
71/71 [00:03<00:00, 19.80sample/s]  
Epoch 5/10, Training Loss: 0.7060243157673732, Validation Loss: 0.7094188632264649  
Accuracy: 0.4903954802259887, Precision: 0.4877509396496702, Recall: 0.4903954802259  
887, F1-score: 0.4742550455380743  
Epoch 6/10 (Train): 100%|██████████| 1  
17/117 [00:12<00:00, 9.20sample/s]  
Epoch 6/10 (Eval): 100%|██████████| 1  
71/71 [00:03<00:00, 19.84sample/s]  
Epoch 6/10, Training Loss: 0.7050112769814532, Validation Loss: 0.6996253930916221  
Accuracy: 0.523728813559322, Precision: 0.523702913706946, Recall: 0.52372881355932  
2, F1-score: 0.5215707330215207
```

```
Epoch 7/10 (Train): 100%|██████████| 1  
17/117 [00:12<00:00, 9.09sample/s]  
Epoch 7/10 (Eval): 100%|██████████|  
71/71 [00:03<00:00, 20.35sample/s]  
Epoch 7/10, Training Loss: 0.7066058872536979, Validation Loss: 0.7040440963823243  
Accuracy: 0.5096045197740113, Precision: 0.5093433844566415, Recall: 0.5096045197740113, F1-score: 0.5020501942602865  
Epoch 8/10 (Train): 100%|██████████| 1  
17/117 [00:12<00:00, 9.09sample/s]  
Epoch 8/10 (Eval): 100%|██████████|  
71/71 [00:03<00:00, 19.82sample/s]  
Epoch 8/10, Training Loss: 0.6982910668220808, Validation Loss: 0.7096356912858068  
Accuracy: 0.5288135593220339, Precision: 0.5396561052374585, Recall: 0.5288135593220339, F1-score: 0.4871566628435495  
Epoch 9/10 (Train): 100%|██████████| 1  
17/117 [00:12<00:00, 9.33sample/s]  
Epoch 9/10 (Eval): 100%|██████████|  
71/71 [00:03<00:00, 19.81sample/s]  
Epoch 00009: reducing learning rate of group 0 to 1.0000e-04.  
  
Epoch 9/10, Training Loss: 0.7003511913309692, Validation Loss: 0.708821444861633  
Accuracy: 0.5090395480225989, Precision: 0.5096079696491763, Recall: 0.5090395480225989, F1-score: 0.47925535415792336  
Epoch 10/10 (Train): 100%|██████████| 1  
17/117 [00:13<00:00, 8.99sample/s]  
Epoch 10/10 (Eval): 100%|██████████|  
71/71 [00:03<00:00, 19.93sample/s]  
Epoch 10/10, Training Loss: 0.6957664279352728, Validation Loss: 0.6964801719969949  
Accuracy: 0.5361581920903955, Precision: 0.5360958205196616, Recall: 0.5361581920903955, F1-score: 0.536002214349046  
Тренировка завершена!  
  
Test: 100%|██████████|  
72/72 [00:04<00:00, 17.21sample/s]  
Test Accuracy: 0.5256410256410257  
Precision: 0.5261146739266783, Recall: 0.5256410256410257, F1-score: 0.5250055380206502  
Accuracy of cats : 56 %  
Accuracy of dogs : 48 %  
  
Class_name: cats  
Train_count: 900  
Test_count: 300  
Valid_count: 300  
Shutil images: 100%|██████████| 150  
0/1500 [00:00<00:00, 1872.48image/s]  
Class_name: dogs  
Train_count: 900  
Test_count: 300  
Valid_count: 300  
Shutil images: 100%|██████████| 150  
0/1500 [00:00<00:00, 1868.12image/s]
```

-----  
Выбранная модель: regnet\_x\_3\_2gf  
Пользовательское название модели: regnet\_x\_3\_2gf\_Exp1  
Выбранный оптимизатор: SGD  
-----

```
Epoch 1/10 (Train): 100%|██████████| 1  
17/117 [00:15<00:00, 7.52sample/s]  
Epoch 1/10 (Eval): 100%|██████████| 1  
71/71 [00:04<00:00, 17.62sample/s]  
Epoch 1/10, Training Loss: 0.7186883056997191, Validation Loss: 0.7129395440810145  
Accuracy: 0.5, Precision: 0.4943257946775088, Recall: 0.5, F1-score: 0.4187345215477  
169  
Epoch 2/10 (Train): 100%|██████████| 1  
17/117 [00:15<00:00, 7.56sample/s]  
Epoch 2/10 (Eval): 100%|██████████| 1  
71/71 [00:04<00:00, 17.37sample/s]  
Epoch 2/10, Training Loss: 0.7159787177876138, Validation Loss: 0.7210794547520115  
Accuracy: 0.5101694915254237, Precision: 0.5140004172099087, Recall: 0.5101694915254  
237, F1-score: 0.48845190731799354  
Epoch 3/10 (Train): 100%|██████████| 1  
17/117 [00:15<00:00, 7.60sample/s]  
Epoch 3/10 (Eval): 100%|██████████| 1  
71/71 [00:04<00:00, 17.69sample/s]  
Epoch 3/10, Training Loss: 0.7103026700273125, Validation Loss: 0.7027700870050548  
Accuracy: 0.49265536723163844, Precision: 0.4926932960790971, Recall: 0.492655367231  
63844, F1-score: 0.49265860605369166  
Epoch 4/10 (Train): 100%|██████████| 1  
17/117 [00:15<00:00, 7.63sample/s]  
Epoch 4/10 (Eval): 100%|██████████| 1  
71/71 [00:04<00:00, 17.61sample/s]  
Epoch 4/10, Training Loss: 0.7120086587684623, Validation Loss: 0.7072082990306919  
Accuracy: 0.5096045197740113, Precision: 0.5146440443157667, Recall: 0.5096045197740  
113, F1-score: 0.4798078871139467  
Epoch 5/10 (Train): 100%|██████████| 1  
17/117 [00:15<00:00, 7.62sample/s]  
Epoch 5/10 (Eval): 100%|██████████| 1  
71/71 [00:04<00:00, 17.51sample/s]  
Epoch 5/10, Training Loss: 0.7041714392025394, Validation Loss: 0.6976520989911031  
Accuracy: 0.5231638418079096, Precision: 0.524575638012848, Recall: 0.52316384180790  
96, F1-score: 0.5194385593220339  
Epoch 6/10 (Train): 100%|██████████| 1  
17/117 [00:15<00:00, 7.58sample/s]  
Epoch 6/10 (Eval): 100%|██████████| 1  
71/71 [00:04<00:00, 17.60sample/s]  
Epoch 6/10, Training Loss: 0.7095817301149152, Validation Loss: 0.704840869048221  
Accuracy: 0.5056497175141242, Precision: 0.505176565773384, Recall: 0.50564971751412  
42, F1-score: 0.47942635677606893
```

```
Epoch 7/10 (Train): 100%|██████████| 1  
17/117 [00:15<00:00, 7.56sample/s]  
Epoch 7/10 (Eval): 100%|██████████| 1  
71/71 [00:04<00:00, 17.63sample/s]  
Epoch 7/10, Training Loss: 0.7056566742366924, Validation Loss: 0.6927325262524987  
Accuracy: 0.5350282485875706, Precision: 0.5367775302602255, Recall: 0.5350282485875  
706, F1-score: 0.5315352340332384  
Epoch 8/10 (Train): 100%|██████████| 1  
17/117 [00:15<00:00, 7.68sample/s]  
Epoch 8/10 (Eval): 100%|██████████| 1  
71/71 [00:04<00:00, 17.55sample/s]  
Epoch 8/10, Training Loss: 0.7050657088908535, Validation Loss: 0.6928003331025442  
Accuracy: 0.5146892655367231, Precision: 0.515278243345372, Recall: 0.51468926553672  
31, F1-score: 0.5132334664411776  
Epoch 9/10 (Train): 100%|██████████| 1  
17/117 [00:15<00:00, 7.66sample/s]  
Epoch 9/10 (Eval): 100%|██████████| 1  
71/71 [00:04<00:00, 17.55sample/s]  
Epoch 9/10, Training Loss: 0.6995627753043354, Validation Loss: 0.7003194844655398  
Accuracy: 0.515819209039548, Precision: 0.5157944003068741, Recall: 0.51581920903954  
8, F1-score: 0.5105895145336767  
Epoch 10/10 (Train): 100%|██████████| 1  
17/117 [00:15<00:00, 7.54sample/s]  
Epoch 10/10 (Eval): 100%|██████████| 1  
71/71 [00:04<00:00, 17.45sample/s]  
Epoch 00010: reducing learning rate of group 0 to 1.0000e-04.  
  
Epoch 10/10, Training Loss: 0.7032250193310895, Validation Loss: 0.7058717733049124  
Accuracy: 0.5372881355932203, Precision: 0.5382790128938939, Recall: 0.537288135593  
203, F1-score: 0.531952904644844  
Тренировка завершена!  
Test: 100%|██████████| 1  
72/72 [00:04<00:00, 15.98sample/s]  
Test Accuracy: 0.5261984392419174  
Precision: 0.528624217948864, Recall: 0.5261984392419174, F1-score: 0.52006587647790  
89  
Accuracy of cats : 64 %  
Accuracy of dogs : 41 %  
  
Class_name: cats  
Train_count: 900  
Test_count: 300  
Valid_count: 300  
Shutil images: 100%|██████████| 150  
0/1500 [00:00<00:00, 1792.67image/s]  
Class_name: dogs  
Train_count: 900  
Test_count: 300  
Valid_count: 300  
Shutil images: 100%|██████████| 150  
0/1500 [00:00<00:00, 1842.23image/s]
```

-----  
Выбранная модель: regnet\_x\_400mf  
Пользовательское название модели: regnet\_x\_400mf\_Exp1  
Выбранный оптимизатор: SGD  
-----

```
Epoch 1/10 (Train): 100%|██████████| 1  
17/117 [00:13<00:00, 8.90sample/s]  
Epoch 1/10 (Eval): 100%|██████████| 1  
71/71 [00:03<00:00, 19.12sample/s]  
Epoch 1/10, Training Loss: 0.768004754661615, Validation Loss: 0.7435673609965265  
Accuracy: 0.5146892655367231, Precision: 0.514621755561087, Recall: 0.51468926553672  
31, F1-score: 0.5093307243636568  
Epoch 2/10 (Train): 100%|██████████| 1  
17/117 [00:12<00:00, 9.06sample/s]  
Epoch 2/10 (Eval): 100%|██████████| 1  
71/71 [00:03<00:00, 19.41sample/s]  
Epoch 2/10, Training Loss: 0.7684576391887795, Validation Loss: 0.726144144679867  
Accuracy: 0.5124293785310734, Precision: 0.5124881412570976, Recall: 0.5124293785310  
734, F1-score: 0.50209038602341  
Epoch 3/10 (Train): 100%|██████████| 1  
17/117 [00:13<00:00, 8.85sample/s]  
Epoch 3/10 (Eval): 100%|██████████| 1  
71/71 [00:03<00:00, 19.30sample/s]  
Epoch 3/10, Training Loss: 0.7653117617815631, Validation Loss: 1.0456400952265088  
Accuracy: 0.4971751412429379, Precision: 0.5026696648802861, Recall: 0.4971751412429  
379, F1-score: 0.3577533848363465  
Epoch 4/10 (Train): 100%|██████████| 1  
17/117 [00:13<00:00, 9.00sample/s]  
Epoch 4/10 (Eval): 100%|██████████| 1  
71/71 [00:03<00:00, 19.10sample/s]  
Epoch 4/10, Training Loss: 0.7564625473280653, Validation Loss: 0.722853198394937  
Accuracy: 0.5112994350282486, Precision: 0.5113588435453653, Recall: 0.5112994350282  
486, F1-score: 0.5112924154653518  
Epoch 5/10 (Train): 100%|██████████| 1  
17/117 [00:12<00:00, 9.12sample/s]  
Epoch 5/10 (Eval): 100%|██████████| 1  
71/71 [00:03<00:00, 19.38sample/s]  
Epoch 5/10, Training Loss: 0.7533074001729938, Validation Loss: 0.7140004533832356  
Accuracy: 0.5146892655367231, Precision: 0.5146024368209924, Recall: 0.5146892655367  
231, F1-score: 0.5145260683627657  
Epoch 6/10 (Train): 100%|██████████| 1  
17/117 [00:13<00:00, 8.83sample/s]  
Epoch 6/10 (Eval): 100%|██████████| 1  
71/71 [00:03<00:00, 19.29sample/s]  
Epoch 6/10, Training Loss: 0.7386769263241044, Validation Loss: 0.7103790607156053  
Accuracy: 0.5096045197740113, Precision: 0.5093247083824863, Recall: 0.5096045197740  
113, F1-score: 0.5031337112587515
```

```
Epoch 7/10 (Train): 100%|██████████| 1  
17/117 [00:12<00:00, 9.02sample/s]  
Epoch 7/10 (Eval): 100%|██████████|  
71/71 [00:03<00:00, 19.14sample/s]  
Epoch 7/10, Training Loss: 0.7387471242952707, Validation Loss: 0.7061991760622983  
Accuracy: 0.5220338983050847, Precision: 0.5228287562047612, Recall: 0.5220338983050847, F1-score: 0.5202539793458584  
Epoch 8/10 (Train): 100%|██████████| 1  
17/117 [00:12<00:00, 9.03sample/s]  
Epoch 8/10 (Eval): 100%|██████████|  
71/71 [00:03<00:00, 19.10sample/s]  
Epoch 8/10, Training Loss: 0.7315576760388139, Validation Loss: 0.6959364350232701  
Accuracy: 0.5322033898305085, Precision: 0.5322712621910805, Recall: 0.5322033898305085, F1-score: 0.5321938334654944  
Epoch 9/10 (Train): 100%|██████████| 1  
17/117 [00:12<00:00, 9.14sample/s]  
Epoch 9/10 (Eval): 100%|██████████|  
71/71 [00:03<00:00, 19.44sample/s]  
Epoch 9/10, Training Loss: 0.7314131767722006, Validation Loss: 0.7422668485149826  
Accuracy: 0.5423728813559322, Precision: 0.5580050161414355, Recall: 0.5423728813559322, F1-score: 0.5046540140205015  
Epoch 10/10 (Train): 100%|██████████| 1  
17/117 [00:13<00:00, 8.96sample/s]  
Epoch 10/10 (Eval): 100%|██████████|  
71/71 [00:03<00:00, 19.53sample/s]  
Epoch 10/10, Training Loss: 0.7264043683463208, Validation Loss: 0.83017934000088  
Accuracy: 0.4994350282485876, Precision: 0.5456129603158396, Recall: 0.4994350282485876, F1-score: 0.34634798883289103  
Тренировка завершена!  
Test: 100%|██████████|  
72/72 [00:04<00:00, 16.80sample/s]  
Test Accuracy: 0.5117056856187291  
Precision: 0.63755504774588, Recall: 0.5117056856187291, F1-score: 0.3603641980690807  
Accuracy of cats : 2 %  
Accuracy of dogs : 99 %  
  
Class_name: cats  
Train_count: 900  
Test_count: 300  
Valid_count: 300  
Shutil images: 100%|██████████| 150  
0/1500 [00:00<00:00, 1848.21image/s]  
Class_name: dogs  
Train_count: 900  
Test_count: 300  
Valid_count: 300  
Shutil images: 100%|██████████| 150  
0/1500 [00:00<00:00, 1841.79image/s]
```

-----  
Выбранная модель: regnet\_x\_800mf  
Пользовательское название модели: regnet\_x\_800mf\_Exp1  
Выбранный оптимизатор: SGD  
-----

```
Epoch 1/10 (Train): 100%|██████████| 1  
17/117 [00:12<00:00, 9.71sample/s]  
Epoch 1/10 (Eval): 100%|██████████| 1  
71/71 [00:03<00:00, 20.98sample/s]  
Epoch 1/10, Training Loss: 0.7309204616556435, Validation Loss: 0.7458039417778705  
Accuracy: 0.5016949152542373, Precision: 0.4965321721909103, Recall: 0.5016949152542  
373, F1-score: 0.39854210318859823  
Epoch 2/10 (Train): 100%|██████████| 1  
17/117 [00:11<00:00, 9.93sample/s]  
Epoch 2/10 (Eval): 100%|██████████| 1  
71/71 [00:03<00:00, 20.75sample/s]  
Epoch 2/10, Training Loss: 0.7297282966748748, Validation Loss: 0.7419730768365375  
Accuracy: 0.49830508474576274, Precision: 0.5009686847857084, Recall: 0.498305084745  
76274, F1-score: 0.4376444187211143  
Epoch 3/10 (Train): 100%|██████████| 1  
17/117 [00:11<00:00, 10.02sample/s]  
Epoch 3/10 (Eval): 100%|██████████| 1  
71/71 [00:03<00:00, 21.30sample/s]  
Epoch 3/10, Training Loss: 0.7217223238381235, Validation Loss: 0.7143622591333875  
Accuracy: 0.507909604519774, Precision: 0.5097105831623059, Recall: 0.50790960451977  
4, F1-score: 0.4976616826794299  
Epoch 4/10 (Train): 100%|██████████| 1  
17/117 [00:12<00:00, 9.64sample/s]  
Epoch 4/10 (Eval): 100%|██████████| 1  
71/71 [00:03<00:00, 20.96sample/s]  
Epoch 4/10, Training Loss: 0.7196234070413157, Validation Loss: 0.730991847602661  
Accuracy: 0.4977401129943503, Precision: 0.5017771331441885, Recall: 0.4977401129943  
503, F1-score: 0.3941294403699637  
Epoch 5/10 (Train): 100%|██████████| 1  
17/117 [00:11<00:00, 9.91sample/s]  
Epoch 5/10 (Eval): 100%|██████████| 1  
71/71 [00:03<00:00, 20.78sample/s]  
Epoch 5/10, Training Loss: 0.7188453922498872, Validation Loss: 0.741585501338129  
Accuracy: 0.507909604519774, Precision: 0.5245916858947952, Recall: 0.50790960451977  
4, F1-score: 0.38386351837056837  
Epoch 6/10 (Train): 100%|██████████| 1  
17/117 [00:11<00:00, 9.80sample/s]  
Epoch 6/10 (Eval): 100%|██████████| 1  
71/71 [00:03<00:00, 20.86sample/s]  
Epoch 00006: reducing learning rate of group 0 to 1.0000e-04.  
Epoch 6/10, Training Loss: 0.720183844922584, Validation Loss: 0.7417021184991308  
Accuracy: 0.5090395480225989, Precision: 0.5397688544238026, Recall: 0.5090395480225  
989, F1-score: 0.3755907385385024
```

```
Epoch 7/10 (Train): 100%|██████████| 1  
17/117 [00:11<00:00, 9.93sample/s]  
Epoch 7/10 (Eval): 100%|██████████|  
71/71 [00:03<00:00, 20.66sample/s]  
Epoch 7/10, Training Loss: 0.7103069940399356, Validation Loss: 0.7023352925050057  
Accuracy: 0.5310734463276836, Precision: 0.5310396570657903, Recall: 0.5310734463276  
836, F1-score: 0.5299688311475269  
Epoch 8/10 (Train): 100%|██████████| 1  
17/117 [00:11<00:00, 9.80sample/s]  
Epoch 8/10 (Eval): 100%|██████████|  
71/71 [00:03<00:00, 20.98sample/s]  
Epoch 8/10, Training Loss: 0.7028107188432653, Validation Loss: 0.6954480064454052  
Accuracy: 0.5344632768361582, Precision: 0.5343932133274192, Recall: 0.5344632768361  
582, F1-score: 0.5340348277380493  
Epoch 9/10 (Train): 100%|██████████| 1  
17/117 [00:11<00:00, 9.83sample/s]  
Epoch 9/10 (Eval): 100%|██████████|  
71/71 [00:03<00:00, 21.29sample/s]  
Epoch 9/10, Training Loss: 0.6981700511727127, Validation Loss: 0.6969753362364688  
Accuracy: 0.5186440677966102, Precision: 0.5185970845487361, Recall: 0.5186440677966  
102, F1-score: 0.5185881287707544  
Epoch 10/10 (Train): 100%|██████████| 1  
17/117 [00:11<00:00, 9.86sample/s]  
Epoch 10/10 (Eval): 100%|██████████|  
71/71 [00:03<00:00, 21.14sample/s]  
Epoch 10/10, Training Loss: 0.7031935776562785, Validation Loss: 0.6940240228580217  
Accuracy: 0.5276836158192091, Precision: 0.5277148240450522, Recall: 0.5276836158192  
091, F1-score: 0.5276884401677306  
Тренировка завершена!  
Test: 100%|██████████|  
72/72 [00:03<00:00, 18.01sample/s]  
Test Accuracy: 0.5284280936454849  
Precision: 0.5283839301602804, Recall: 0.5284280936454849, F1-score: 0.5283823691555  
346  
Accuracy of cats : 51 %  
Accuracy of dogs : 53 %  
  
Class_name: cats  
Train_count: 900  
Test_count: 300  
Valid_count: 300  
Shutil images: 100%|██████████| 150  
0/1500 [00:00<00:00, 1854.20image/s]  
Class_name: dogs  
Train_count: 900  
Test_count: 300  
Valid_count: 300  
Shutil images: 100%|██████████| 150  
0/1500 [00:00<00:00, 1842.60image/s]
```

-----  
Выбранная модель: regnet\_y\_16gf  
Пользовательское название модели: regnet\_y\_16gf\_Exp1  
Выбранный оптимизатор: SGD  
-----

```
Epoch 1/10 (Train): 100%|██████████| 1  
17/117 [00:17<00:00, 6.62sample/s]  
Epoch 1/10 (Eval): 100%|██████████| 1  
71/71 [00:04<00:00, 14.91sample/s]  
Epoch 1/10, Training Loss: 0.7184477871701356, Validation Loss: 0.7184967366652301  
Accuracy: 0.5096045197740113, Precision: 0.5195932188512855, Recall: 0.5096045197740113, F1-score: 0.413990061942686  
Epoch 2/10 (Train): 100%|██████████| 1  
17/117 [00:17<00:00, 6.67sample/s]  
Epoch 2/10 (Eval): 100%|██████████| 1  
71/71 [00:04<00:00, 14.77sample/s]  
Epoch 2/10, Training Loss: 0.7087817644525506, Validation Loss: 0.7290411943432975  
Accuracy: 0.5062146892655367, Precision: 0.5105605104911453, Recall: 0.5062146892655367, F1-score: 0.40534113025990437  
Epoch 3/10 (Train): 100%|██████████| 1  
17/117 [00:17<00:00, 6.63sample/s]  
Epoch 3/10 (Eval): 100%|██████████| 1  
71/71 [00:04<00:00, 14.76sample/s]  
Epoch 3/10, Training Loss: 0.7040915593372133, Validation Loss: 0.7024084565329687  
Accuracy: 0.5282485875706214, Precision: 0.5407926072306249, Recall: 0.5282485875706214, F1-score: 0.4952490479919406  
Epoch 4/10 (Train): 100%|██████████| 1  
17/117 [00:17<00:00, 6.65sample/s]  
Epoch 4/10 (Eval): 100%|██████████| 1  
71/71 [00:04<00:00, 14.70sample/s]  
Epoch 4/10, Training Loss: 0.704954941543183, Validation Loss: 0.7072623979910618  
Accuracy: 0.5327683615819209, Precision: 0.55722051482701, Recall: 0.5327683615819209, F1-score: 0.4827537550437681  
Epoch 5/10 (Train): 100%|██████████| 1  
17/117 [00:17<00:00, 6.61sample/s]  
Epoch 5/10 (Eval): 100%|██████████| 1  
71/71 [00:04<00:00, 14.60sample/s]  
Epoch 5/10, Training Loss: 0.7047091691848593, Validation Loss: 0.7045143773663516  
Accuracy: 0.5412429378531074, Precision: 0.5631620821375867, Recall: 0.5412429378531074, F1-score: 0.5022339976751162  
Epoch 6/10 (Train): 100%|██████████| 1  
17/117 [00:17<00:00, 6.64sample/s]  
Epoch 6/10 (Eval): 100%|██████████| 1  
71/71 [00:04<00:00, 14.76sample/s]  
Epoch 6/10, Training Loss: 0.7065966888761749, Validation Loss: 0.6979422929596766  
Accuracy: 0.5344632768361582, Precision: 0.5400407467767067, Recall: 0.5344632768361582, F1-score: 0.5214592088523046
```

```
Epoch 7/10 (Train): 100%|██████████| 1  
17/117 [00:17<00:00, 6.57sample/s]  
Epoch 7/10 (Eval): 100%|██████████|  
71/71 [00:04<00:00, 14.48sample/s]  
Epoch 7/10, Training Loss: 0.7034480743942562, Validation Loss: 0.7009540880467259  
Accuracy: 0.5474576271186441, Precision: 0.5607132880739459, Recall: 0.5474576271186  
441, F1-score: 0.5247780934918299  
Epoch 8/10 (Train): 100%|██████████| 1  
17/117 [00:17<00:00, 6.58sample/s]  
Epoch 8/10 (Eval): 100%|██████████|  
71/71 [00:04<00:00, 14.63sample/s]  
Epoch 8/10, Training Loss: 0.6998617958336191, Validation Loss: 0.7114520953536707  
Accuracy: 0.5214689265536723, Precision: 0.534154148479867, Recall: 0.52146892655367  
23, F1-score: 0.4809562097385519  
Epoch 9/10 (Train): 100%|██████████| 1  
17/117 [00:17<00:00, 6.56sample/s]  
Epoch 9/10 (Eval): 100%|██████████|  
71/71 [00:04<00:00, 14.56sample/s]  
Epoch 00009: reducing learning rate of group 0 to 1.0000e-04.  
  
Epoch 9/10, Training Loss: 0.6981676525045046, Validation Loss: 0.711992785082025  
Accuracy: 0.5587570621468927, Precision: 0.5710548435992835, Recall: 0.5587570621468  
927, F1-score: 0.5413603022846791  
Epoch 10/10 (Train): 100%|██████████| 1  
17/117 [00:17<00:00, 6.56sample/s]  
Epoch 10/10 (Eval): 100%|██████████|  
71/71 [00:04<00:00, 14.66sample/s]  
Epoch 10/10, Training Loss: 0.6887121175028348, Validation Loss: 0.6922288621212803  
Accuracy: 0.5350282485875706, Precision: 0.5358537407668496, Recall: 0.5350282485875  
706, F1-score: 0.5336907576561288  
Тренировка завершена!  
Test: 100%|██████████|  
72/72 [00:05<00:00, 14.15sample/s]  
Test Accuracy: 0.544593088071349  
Precision: 0.5447185053419672, Recall: 0.544593088071349, F1-score: 0.54312243231368  
34  
Accuracy of cats : 48 %  
Accuracy of dogs : 60 %  
  
Class_name: cats  
Train_count: 900  
Test_count: 300  
Valid_count: 300  
Shutil images: 100%|██████████| 150  
0/1500 [00:00<00:00, 1803.26image/s]  
Class_name: dogs  
Train_count: 900  
Test_count: 300  
Valid_count: 300  
Shutil images: 100%|██████████| 150  
0/1500 [00:00<00:00, 1599.03image/s]
```

-----  
Выбранная модель: regnet\_y\_1\_6gf  
Пользовательское название модели: regnet\_y\_1\_6gf\_Exp1  
Выбранный оптимизатор: SGD  
-----

```
Epoch 1/10 (Train): 100%|██████████| 1  
17/117 [00:21<00:00, 5.33sample/s]  
Epoch 1/10 (Eval): 100%|██████████| 1  
71/71 [00:04<00:00, 14.55sample/s]  
Epoch 1/10, Training Loss: 0.7173575204149185, Validation Loss: 1.015454506890922  
Accuracy: 0.5084745762711864, Precision: 0.5113317249339542, Recall: 0.5084745762711  
864, F1-score: 0.49102366611120235  
Epoch 2/10 (Train): 100%|██████████| 1  
17/117 [00:21<00:00, 5.45sample/s]  
Epoch 2/10 (Eval): 100%|██████████| 1  
71/71 [00:04<00:00, 14.58sample/s]  
Epoch 2/10, Training Loss: 0.7122974308326361, Validation Loss: 0.9174594453162392  
Accuracy: 0.5214689265536723, Precision: 0.5213855390350687, Recall: 0.5214689265536  
723, F1-score: 0.5212872166680567  
Epoch 3/10 (Train): 100%|██████████| 1  
17/117 [00:21<00:00, 5.37sample/s]  
Epoch 3/10 (Eval): 100%|██████████| 1  
71/71 [00:04<00:00, 14.47sample/s]  
Epoch 3/10, Training Loss: 0.7120112319406048, Validation Loss: 0.8656397800324327  
Accuracy: 0.503954802259887, Precision: 0.5030963161498326, Recall: 0.50395480225988  
7, F1-score: 0.482023511574755  
Epoch 4/10 (Train): 100%|██████████| 1  
17/117 [00:21<00:00, 5.48sample/s]  
Epoch 4/10 (Eval): 100%|██████████| 1  
71/71 [00:04<00:00, 14.58sample/s]  
Epoch 4/10, Training Loss: 0.7088632349938543, Validation Loss: 0.7508046408157564  
Accuracy: 0.5129943502824859, Precision: 0.5140872584031986, Recall: 0.5129943502824  
859, F1-score: 0.509090532528473  
Epoch 5/10 (Train): 100%|██████████| 1  
17/117 [00:21<00:00, 5.51sample/s]  
Epoch 5/10 (Eval): 100%|██████████| 1  
71/71 [00:04<00:00, 14.58sample/s]  
Epoch 5/10, Training Loss: 0.7079917011275694, Validation Loss: 0.8437499198536415  
Accuracy: 0.5316384180790961, Precision: 0.5334232523687508, Recall: 0.5316384180790  
961, F1-score: 0.5277387632045764  
Epoch 6/10 (Train): 100%|██████████| 1  
17/117 [00:21<00:00, 5.45sample/s]  
Epoch 6/10 (Eval): 100%|██████████| 1  
71/71 [00:04<00:00, 14.64sample/s]  
Epoch 6/10, Training Loss: 0.6999299046599432, Validation Loss: 0.7936470682001383  
Accuracy: 0.5265536723163842, Precision: 0.5343762390860584, Recall: 0.5265536723163  
842, F1-score: 0.490574459497196
```

```
Epoch 7/10 (Train): 100%|██████████| 1  
17/117 [00:21<00:00, 5.47sample/s]  
Epoch 7/10 (Eval): 100%|██████████|  
71/71 [00:04<00:00, 14.65sample/s]  
Epoch 00007: reducing learning rate of group 0 to 1.0000e-04.  
  
Epoch 7/10, Training Loss: 0.6977710025493539, Validation Loss: 0.8849039646865284  
Accuracy: 0.5327683615819209, Precision: 0.5356315398751443, Recall: 0.5327683615819  
209, F1-score: 0.5261725132714794  
Epoch 8/10 (Train): 100%|██████████| 1  
17/117 [00:21<00:00, 5.43sample/s]  
Epoch 8/10 (Eval): 100%|██████████|  
71/71 [00:04<00:00, 14.63sample/s]  
Epoch 8/10, Training Loss: 0.7008094570259267, Validation Loss: 0.7506071746686084  
Accuracy: 0.5288135593220339, Precision: 0.5300395537992025, Recall: 0.5288135593220  
339, F1-score: 0.5261850938913832  
Epoch 9/10 (Train): 100%|██████████| 1  
17/117 [00:21<00:00, 5.49sample/s]  
Epoch 9/10 (Eval): 100%|██████████|  
71/71 [00:04<00:00, 14.69sample/s]  
Epoch 9/10, Training Loss: 0.6988985482718211, Validation Loss: 0.7643676507944441  
Accuracy: 0.5350282485875706, Precision: 0.5394954560790918, Recall: 0.5350282485875  
706, F1-score: 0.5248701715905557  
Epoch 10/10 (Train): 100%|██████████| 1  
17/117 [00:21<00:00, 5.50sample/s]  
Epoch 10/10 (Eval): 100%|██████████|  
71/71 [00:04<00:00, 14.68sample/s]  
Epoch 10/10, Training Loss: 0.6953307677818701, Validation Loss: 0.7923423753956617  
Accuracy: 0.5350282485875706, Precision: 0.54056106436872, Recall: 0.535028248587570  
6, F1-score: 0.5223126999778903  
Тренировка завершена!  
  
Test: 100%|██████████|  
72/72 [00:05<00:00, 13.94sample/s]  
Test Accuracy: 0.520066889632107  
Precision: 0.5209082730832131, Recall: 0.520066889632107, F1-score: 0.50772196533923  
01  
Accuracy of cats : 36 %  
Accuracy of dogs : 67 %  
  
Class_name: cats  
Train_count: 900  
Test_count: 300  
Valid_count: 300  
Shutil images: 100%|██████████| 150  
0/1500 [00:00<00:00, 1837.23image/s]  
Class_name: dogs  
Train_count: 900  
Test_count: 300  
Valid_count: 300  
Shutil images: 100%|██████████| 150  
0/1500 [00:00<00:00, 1751.47image/s]
```

-----  
Выбранная модель: regnet\_y\_3\_2gf  
Пользовательское название модели: regnet\_y\_3\_2gf\_Exp1  
Выбранный оптимизатор: SGD  
-----

```
Epoch 1/10 (Train): 100%|██████████| 1  
17/117 [00:19<00:00, 5.89sample/s]  
Epoch 1/10 (Eval): 100%|██████████| 1  
71/71 [00:04<00:00, 15.47sample/s]  
Epoch 1/10, Training Loss: 0.7016792023443374, Validation Loss: 0.7110249448967518  
Accuracy: 0.49548022598870056, Precision: 0.4921541554409417, Recall: 0.495480225988  
70056, F1-score: 0.4654844317847957  
Epoch 2/10 (Train): 100%|██████████| 1  
17/117 [00:19<00:00, 6.13sample/s]  
Epoch 2/10 (Eval): 100%|██████████| 1  
71/71 [00:04<00:00, 15.37sample/s]  
Epoch 2/10, Training Loss: 0.708917716927852, Validation Loss: 0.7367436190446218  
Accuracy: 0.5152542372881356, Precision: 0.51517624291348, Recall: 0.515254237288135  
6, F1-score: 0.5151204974094717  
Epoch 3/10 (Train): 100%|██████████| 1  
17/117 [00:19<00:00, 6.05sample/s]  
Epoch 3/10 (Eval): 100%|██████████| 1  
71/71 [00:04<00:00, 15.47sample/s]  
Epoch 3/10, Training Loss: 0.7014990386650773, Validation Loss: 0.7735538272197637  
Accuracy: 0.5050847457627119, Precision: 0.5055379400134266, Recall: 0.5050847457627  
119, F1-score: 0.42990275732693645  
Epoch 4/10 (Train): 100%|██████████| 1  
17/117 [00:19<00:00, 6.05sample/s]  
Epoch 4/10 (Eval): 100%|██████████| 1  
71/71 [00:04<00:00, 15.32sample/s]  
Epoch 00004: reducing learning rate of group 0 to 1.0000e-04.  
Epoch 4/10, Training Loss: 0.7091044977440092, Validation Loss: 0.7728807163440575  
Accuracy: 0.5062146892655367, Precision: 0.5060209715712315, Recall: 0.5062146892655  
367, F1-score: 0.505573778664008  
Epoch 5/10 (Train): 100%|██████████| 1  
17/117 [00:19<00:00, 6.01sample/s]  
Epoch 5/10 (Eval): 100%|██████████| 1  
71/71 [00:04<00:00, 15.16sample/s]  
Epoch 5/10, Training Loss: 0.705626193875724, Validation Loss: 0.7075582506966456  
Accuracy: 0.5096045197740113, Precision: 0.5103856829670311, Recall: 0.5096045197740  
113, F1-score: 0.4791023600465868  
Epoch 6/10 (Train): 100%|██████████| 1  
17/117 [00:19<00:00, 5.92sample/s]  
Epoch 6/10 (Eval): 100%|██████████| 1  
71/71 [00:04<00:00, 15.29sample/s]  
Epoch 6/10, Training Loss: 0.6982141059910786, Validation Loss: 0.7238679918865699  
Accuracy: 0.5316384180790961, Precision: 0.5373617838373752, Recall: 0.5316384180790  
961, F1-score: 0.5075780065130675
```

```
Epoch 7/10 (Train): 100%|██████████| 1  
17/117 [00:19<00:00, 5.98sample/s]  
Epoch 7/10 (Eval): 100%|██████████|  
71/71 [00:04<00:00, 15.35sample/s]  
Epoch 7/10, Training Loss: 0.6986677610481986, Validation Loss: 0.7215491282401112  
Accuracy: 0.5186440677966102, Precision: 0.5194208638267612, Recall: 0.5186440677966  
102, F1-score: 0.5069949245552552  
Epoch 8/10 (Train): 100%|██████████| 1  
17/117 [00:19<00:00, 6.09sample/s]  
Epoch 8/10 (Eval): 100%|██████████|  
71/71 [00:04<00:00, 15.37sample/s]  
Epoch 00008: reducing learning rate of group 0 to 1.0000e-05.  
  
Epoch 8/10, Training Loss: 0.6944421959544307, Validation Loss: 0.7278862124108999  
Accuracy: 0.5112994350282486, Precision: 0.511243700641533, Recall: 0.51129943502824  
86, F1-score: 0.5012660062527892  
Epoch 9/10 (Train): 100%|██████████| 1  
17/117 [00:19<00:00, 6.04sample/s]  
Epoch 9/10 (Eval): 100%|██████████|  
71/71 [00:04<00:00, 15.21sample/s]  
Epoch 9/10, Training Loss: 0.6901232222321101, Validation Loss: 0.7290961247379497  
Accuracy: 0.5152542372881356, Precision: 0.5163480716808572, Recall: 0.5152542372881  
356, F1-score: 0.4966628869683297  
Epoch 10/10 (Train): 100%|██████████| 1  
17/117 [00:19<00:00, 6.03sample/s]  
Epoch 10/10 (Eval): 100%|██████████|  
71/71 [00:04<00:00, 15.43sample/s]  
Epoch 10/10, Training Loss: 0.6935404733568941, Validation Loss: 0.7005273007740409  
Accuracy: 0.5276836158192091, Precision: 0.5290110299715859, Recall: 0.5276836158192  
091, F1-score: 0.5180653342518864  
Тренировка завершена!  
  
Test: 100%|██████████|  
72/72 [00:05<00:00, 14.04sample/s]  
Test Accuracy: 0.5133779264214047  
Precision: 0.5157482409878299, Recall: 0.5133779264214047, F1-score: 0.5037589607432  
345  
Accuracy of cats : 65 %  
Accuracy of dogs : 37 %  
  
Class_name: cats  
Train_count: 900  
Test_count: 300  
Valid_count: 300  
  
Shutil images: 100%|██████████| 150  
0/1500 [00:00<00:00, 1834.76image/s]  
Class_name: dogs  
Train_count: 900  
Test_count: 300  
Valid_count: 300  
  
Shutil images: 100%|██████████| 150  
0/1500 [00:00<00:00, 1817.82image/s]
```

-----  
Выбранная модель: regnet\_y\_400mf  
Пользовательское название модели: regnet\_y\_400mf\_Exp1  
Выбранный оптимизатор: SGD  
-----

```
Epoch 1/10 (Train): 100%|██████████| 1  
17/117 [00:14<00:00, 8.07sample/s]  
Epoch 1/10 (Eval): 100%|██████████| 1  
71/71 [00:04<00:00, 16.63sample/s]  
Epoch 1/10, Training Loss: 0.7276306996368398, Validation Loss: 0.7287612702213438  
Accuracy: 0.5112994350282486, Precision: 0.5115937726375935, Recall: 0.5112994350282486, F1-score: 0.5107978232284639  
Epoch 2/10 (Train): 100%|██████████| 1  
17/117 [00:14<00:00, 8.06sample/s]  
Epoch 2/10 (Eval): 100%|██████████| 1  
71/71 [00:04<00:00, 16.65sample/s]  
Epoch 2/10, Training Loss: 0.7366600080946686, Validation Loss: 0.7864972187974358  
Accuracy: 0.5045197740112994, Precision: 0.5037666273331903, Recall: 0.5045197740112994, F1-score: 0.47624033268238863  
Epoch 3/10 (Train): 100%|██████████| 1  
17/117 [00:14<00:00, 8.22sample/s]  
Epoch 3/10 (Eval): 100%|██████████| 1  
71/71 [00:04<00:00, 16.93sample/s]  
Epoch 3/10, Training Loss: 0.7242947541294725, Validation Loss: 0.7364737734956256  
Accuracy: 0.4937853107344633, Precision: 0.4935516912466065, Recall: 0.4937853107344633, F1-score: 0.4932086369997987  
Epoch 4/10 (Train): 100%|██████████| 1  
17/117 [00:14<00:00, 8.21sample/s]  
Epoch 4/10 (Eval): 100%|██████████| 1  
71/71 [00:04<00:00, 17.07sample/s]  
Epoch 4/10, Training Loss: 0.7229407515690864, Validation Loss: 0.723539018866706  
Accuracy: 0.5293785310734463, Precision: 0.5300254601354545, Recall: 0.5293785310734463, F1-score: 0.523835126100862  
Epoch 5/10 (Train): 100%|██████████| 1  
17/117 [00:14<00:00, 8.09sample/s]  
Epoch 5/10 (Eval): 100%|██████████| 1  
71/71 [00:04<00:00, 16.88sample/s]  
Epoch 5/10, Training Loss: 0.7166485542136566, Validation Loss: 0.7441874196973898  
Accuracy: 0.49887005649717514, Precision: 0.5011267765082467, Recall: 0.49887005649717514, F1-score: 0.4568146684240247  
Epoch 6/10 (Train): 100%|██████████| 1  
17/117 [00:14<00:00, 8.21sample/s]  
Epoch 6/10 (Eval): 100%|██████████| 1  
71/71 [00:04<00:00, 17.26sample/s]  
Epoch 6/10, Training Loss: 0.7091001681549407, Validation Loss: 0.7453071771368469  
Accuracy: 0.5152542372881356, Precision: 0.5150822797407727, Recall: 0.5152542372881356, F1-score: 0.5129447657228539
```

```
Epoch 7/10 (Train): 100%|██████████| 1  
17/117 [00:14<00:00, 8.21sample/s]  
Epoch 7/10 (Eval): 100%|██████████|  
71/71 [00:04<00:00, 16.88sample/s]  
Epoch 00007: reducing learning rate of group 0 to 1.0000e-04.  
  
Epoch 7/10, Training Loss: 0.724201944509216, Validation Loss: 0.7450576086165541  
Accuracy: 0.5073446327683616, Precision: 0.5070169165733626, Recall: 0.5073446327683  
616, F1-score: 0.5047590550040413  
  
Epoch 8/10 (Train): 100%|██████████| 1  
17/117 [00:14<00:00, 8.17sample/s]  
Epoch 8/10 (Eval): 100%|██████████|  
71/71 [00:04<00:00, 16.94sample/s]  
Epoch 8/10, Training Loss: 0.7080387806058992, Validation Loss: 0.7281609019317196  
Accuracy: 0.5045197740112994, Precision: 0.5041794955409604, Recall: 0.5045197740112  
994, F1-score: 0.5025683271305751  
  
Epoch 9/10 (Train): 100%|██████████| 1  
17/117 [00:14<00:00, 8.16sample/s]  
Epoch 9/10 (Eval): 100%|██████████|  
71/71 [00:04<00:00, 17.02sample/s]  
Epoch 9/10, Training Loss: 0.7068711188127114, Validation Loss: 0.7423754292356093  
Accuracy: 0.5175141242937853, Precision: 0.5174492312653434, Recall: 0.5175141242937  
853, F1-score: 0.5139329745594308  
  
Epoch 10/10 (Train): 100%|██████████| 1  
17/117 [00:14<00:00, 8.32sample/s]  
Epoch 10/10 (Eval): 100%|██████████|  
71/71 [00:04<00:00, 16.98sample/s]  
Epoch 00010: reducing learning rate of group 0 to 1.0000e-05.  
  
Epoch 10/10, Training Loss: 0.71336342172724, Validation Loss: 0.7522895905257618  
Accuracy: 0.5203389830508475, Precision: 0.5203861982022016, Recall: 0.5203389830508  
475, F1-score: 0.5164399780445666  
Тренировка завершена!  
  
Test: 100%|██████████|  
72/72 [00:04<00:00, 15.53sample/s]  
Test Accuracy: 0.4916387959866221  
Precision: 0.49212111220160715, Recall: 0.4916387959866221, F1-score: 0.486538687346  
0217  
Accuracy of cats : 59 %  
Accuracy of dogs : 39 %  
  
Class_name: cats  
Train_count: 900  
Test_count: 300  
Valid_count: 300  
  
Shutil images: 100%|██████████| 150  
0/1500 [00:00<00:00, 1855.65image/s]  
Class_name: dogs  
Train_count: 900  
Test_count: 300  
Valid_count: 300  
  
Shutil images: 100%|██████████| 150  
0/1500 [00:00<00:00, 1838.60image/s]
```

-----  
Выбранная модель: regnet\_y\_800mf  
Пользовательское название модели: regnet\_y\_800mf\_Exp1  
Выбранный оптимизатор: SGD  
-----

```
Epoch 1/10 (Train): 100%|██████████| 1  
17/117 [00:14<00:00, 8.32sample/s]  
Epoch 1/10 (Eval): 100%|██████████| 1  
71/71 [00:03<00:00, 18.38sample/s]  
Epoch 1/10, Training Loss: 0.711368078418265, Validation Loss: 0.7340218564548061  
Accuracy: 0.5209039548022599, Precision: 0.5208582454118739, Recall: 0.5209039548022  
599, F1-score: 0.5183097262737149  
Epoch 2/10 (Train): 100%|██████████| 1  
17/117 [00:14<00:00, 8.34sample/s]  
Epoch 2/10 (Eval): 100%|██████████| 1  
71/71 [00:03<00:00, 18.39sample/s]  
Epoch 2/10, Training Loss: 0.7128786649542201, Validation Loss: 0.7141957853810262  
Accuracy: 0.496045197740113, Precision: 0.4966919250963199, Recall: 0.49604519774011  
3, F1-score: 0.4884388869134632  
Epoch 3/10 (Train): 100%|██████████| 1  
17/117 [00:14<00:00, 8.34sample/s]  
Epoch 3/10 (Eval): 100%|██████████| 1  
71/71 [00:03<00:00, 18.73sample/s]  
Epoch 3/10, Training Loss: 0.7030454563759548, Validation Loss: 0.7037355982314395  
Accuracy: 0.5141242937853108, Precision: 0.516194521486671, Recall: 0.51412429378531  
08, F1-score: 0.48450037945863905  
Epoch 4/10 (Train): 100%|██████████| 1  
17/117 [00:13<00:00, 8.44sample/s]  
Epoch 4/10 (Eval): 100%|██████████| 1  
71/71 [00:03<00:00, 18.84sample/s]  
Epoch 4/10, Training Loss: 0.696808632634289, Validation Loss: 0.7116020714159066  
Accuracy: 0.5327683615819209, Precision: 0.5381018848217254, Recall: 0.5327683615819  
209, F1-score: 0.5107826296242234  
Epoch 5/10 (Train): 100%|██████████| 1  
17/117 [00:14<00:00, 8.34sample/s]  
Epoch 5/10 (Eval): 100%|██████████| 1  
71/71 [00:03<00:00, 18.92sample/s]  
Epoch 5/10, Training Loss: 0.692525988698741, Validation Loss: 0.7041846210673705  
Accuracy: 0.5333333333333333, Precision: 0.5336763314254065, Recall: 0.5333333333333  
333, F1-score: 0.530139983458722  
Epoch 6/10 (Train): 100%|██████████| 1  
17/117 [00:14<00:00, 8.35sample/s]  
Epoch 6/10 (Eval): 100%|██████████| 1  
71/71 [00:03<00:00, 18.51sample/s]  
Epoch 6/10, Training Loss: 0.6984549819646918, Validation Loss: 0.6987422440348372  
Accuracy: 0.523728813559322, Precision: 0.525750223015165, Recall: 0.52372881355932  
2, F1-score: 0.5081370442024429
```

```
Epoch 7/10 (Train): 100%|██████████| 1  
17/117 [00:13<00:00, 8.36sample/s]  
Epoch 7/10 (Eval): 100%|██████████|  
71/71 [00:03<00:00, 18.68sample/s]  
Epoch 7/10, Training Loss: 0.7002539229033499, Validation Loss: 0.703730735570024  
Accuracy: 0.5220338983050847, Precision: 0.523238128197154, Recall: 0.5220338983050847, F1-score: 0.5099372489468654  
Epoch 8/10 (Train): 100%|██████████| 1  
17/117 [00:13<00:00, 8.42sample/s]  
Epoch 8/10 (Eval): 100%|██████████|  
71/71 [00:03<00:00, 18.42sample/s]  
Epoch 8/10, Training Loss: 0.7011844547870144, Validation Loss: 0.7185956430805605  
Accuracy: 0.5056497175141242, Precision: 0.5080506697935544, Recall: 0.5056497175141242, F1-score: 0.41213954918958007  
Epoch 9/10 (Train): 100%|██████████| 1  
17/117 [00:14<00:00, 8.27sample/s]  
Epoch 9/10 (Eval): 100%|██████████|  
71/71 [00:03<00:00, 18.72sample/s]  
Epoch 00009: reducing learning rate of group 0 to 1.0000e-04.  
Epoch 9/10, Training Loss: 0.6972301031237518, Validation Loss: 0.7141254236132412  
Accuracy: 0.5090395480225989, Precision: 0.508770520203169, Recall: 0.5090395480225989, F1-score: 0.5071754350769644  
Epoch 10/10 (Train): 100%|██████████| 1  
17/117 [00:14<00:00, 8.35sample/s]  
Epoch 10/10 (Eval): 100%|██████████|  
71/71 [00:03<00:00, 18.60sample/s]  
Epoch 10/10, Training Loss: 0.6994714445860276, Validation Loss: 0.6973344513588706  
Accuracy: 0.507909604519774, Precision: 0.5077782253346175, Recall: 0.507909604519774, F1-score: 0.48821922311214383  
Тренировка завершена!  
Test: 100%|██████████|  
72/72 [00:04<00:00, 17.07sample/s]  
Test Accuracy: 0.5055741360089187  
Precision: 0.508264741703008, Recall: 0.5055741360089187, F1-score: 0.48741291642355045  
Accuracy of cats : 69 %  
Accuracy of dogs : 31 %  
  
Class_name: cats  
Train_count: 900  
Test_count: 300  
Valid_count: 300  
Shutil images: 100%|██████████| 150  
0/1500 [00:00<00:00, 1847.83image/s]  
Class_name: dogs  
Train_count: 900  
Test_count: 300  
Valid_count: 300  
Shutil images: 100%|██████████| 150  
0/1500 [00:00<00:00, 1860.57image/s]
```

-----  
Выбранная модель: regnet\_y\_8gf  
Пользовательское название модели: regnet\_y\_8gf\_Exp1  
Выбранный оптимизатор: SGD  
-----

```
Epoch 1/10 (Train): 100%|██████████| 1  
17/117 [00:16<00:00, 7.29sample/s]  
Epoch 1/10 (Eval): 100%|██████████| 1  
71/71 [00:04<00:00, 16.95sample/s]  
Epoch 1/10, Training Loss: 0.710287299382515, Validation Loss: 0.7677390711792444  
Accuracy: 0.5022598870056497, Precision: 0.5022484727790824, Recall: 0.5022598870056497, F1-score: 0.5022527371081708  
Epoch 2/10 (Train): 100%|██████████| 1  
17/117 [00:16<00:00, 7.31sample/s]  
Epoch 2/10 (Eval): 100%|██████████| 1  
71/71 [00:04<00:00, 16.73sample/s]  
Epoch 2/10, Training Loss: 0.7034229059755353, Validation Loss: 0.7359135460718876  
Accuracy: 0.4971751412429379, Precision: 0.4982214779380658, Recall: 0.4971751412429379, F1-score: 0.4784089991928975  
Epoch 3/10 (Train): 100%|██████████| 1  
17/117 [00:16<00:00, 7.17sample/s]  
Epoch 3/10 (Eval): 100%|██████████| 1  
71/71 [00:04<00:00, 16.60sample/s]  
Epoch 3/10, Training Loss: 0.7116772855815208, Validation Loss: 0.7339193499357687  
Accuracy: 0.5045197740112994, Precision: 0.5038356285310734, Recall: 0.5045197740112994, F1-score: 0.46128102662304665  
Epoch 4/10 (Train): 100%|██████████| 1  
17/117 [00:16<00:00, 7.26sample/s]  
Epoch 4/10 (Eval): 100%|██████████| 1  
71/71 [00:04<00:00, 16.66sample/s]  
Epoch 4/10, Training Loss: 0.6983503590020682, Validation Loss: 0.7037038651563353  
Accuracy: 0.5163841807909605, Precision: 0.5219938966046641, Recall: 0.5163841807909605, F1-score: 0.47021921667882743  
Epoch 5/10 (Train): 100%|██████████| 1  
17/117 [00:16<00:00, 7.14sample/s]  
Epoch 5/10 (Eval): 100%|██████████| 1  
71/71 [00:04<00:00, 16.66sample/s]  
Epoch 5/10, Training Loss: 0.7041956996819677, Validation Loss: 0.7206064225253412  
Accuracy: 0.5214689265536723, Precision: 0.5333570032679303, Recall: 0.5214689265536723, F1-score: 0.4830508352067922  
Epoch 6/10 (Train): 100%|██████████| 1  
17/117 [00:16<00:00, 7.09sample/s]  
Epoch 6/10 (Eval): 100%|██████████| 1  
71/71 [00:04<00:00, 16.13sample/s]  
Epoch 6/10, Training Loss: 0.7031578251643896, Validation Loss: 0.6936604623067177  
Accuracy: 0.5519774011299435, Precision: 0.5732990251736979, Recall: 0.5519774011299435, F1-score: 0.5203410004360824
```

```
Epoch 7/10 (Train): 100%|██████████| 1  
17/117 [00:16<00:00, 7.17sample/s]  
Epoch 7/10 (Eval): 100%|██████████| 1  
71/71 [00:04<00:00, 16.51sample/s]  
Epoch 7/10, Training Loss: 0.6961824575705917, Validation Loss: 0.7534485397029058  
Accuracy: 0.5276836158192091, Precision: 0.5548311930741712, Recall: 0.5276836158192091, F1-score: 0.45332386033205657  
Epoch 8/10 (Train): 100%|██████████| 1  
17/117 [00:16<00:00, 7.15sample/s]  
Epoch 8/10 (Eval): 100%|██████████| 1  
71/71 [00:04<00:00, 16.33sample/s]  
Epoch 8/10, Training Loss: 0.6958224140388497, Validation Loss: 0.7141524107947861  
Accuracy: 0.523728813559322, Precision: 0.5655214310777326, Recall: 0.523728813559322, F1-score: 0.42546239063936814  
Epoch 9/10 (Train): 100%|██████████| 1  
17/117 [00:16<00:00, 7.14sample/s]  
Epoch 9/10 (Eval): 100%|██████████| 1  
71/71 [00:04<00:00, 16.53sample/s]  
Epoch 9/10, Training Loss: 0.6954158680989695, Validation Loss: 0.6820300324151745  
Accuracy: 0.5491525423728814, Precision: 0.5491051056082317, Recall: 0.5491525423728814, F1-score: 0.5490102963096649  
Epoch 10/10 (Train): 100%|██████████| 1  
17/117 [00:16<00:00, 7.16sample/s]  
Epoch 10/10 (Eval): 100%|██████████| 1  
71/71 [00:04<00:00, 16.52sample/s]  
Epoch 10/10, Training Loss: 0.6954169744208221, Validation Loss: 0.6949288206922133  
Accuracy: 0.5587570621468927, Precision: 0.559407322043649, Recall: 0.5587570621468927, F1-score: 0.5581291483067896  
Тренировка завершена!  
Test: 100%|██████████| 1  
72/72 [00:04<00:00, 15.48sample/s]  
Test Accuracy: 0.5484949832775919  
Precision: 0.5484873675199042, Recall: 0.5484949832775919, F1-score: 0.5484904937336463  
Accuracy of cats : 54 %  
Accuracy of dogs : 55 %  
  
Class_name: cats  
Train_count: 900  
Test_count: 300  
Valid_count: 300  
Shutil images: 100%|██████████| 150  
0/1500 [00:00<00:00, 1806.73image/s]  
Class_name: dogs  
Train_count: 900  
Test_count: 300  
Valid_count: 300  
Shutil images: 100%|██████████| 150  
0/1500 [00:00<00:00, 1799.36image/s]
```

-----  
Выбранная модель: resnet101  
Пользовательское название модели: resnet101\_Exp1  
Выбранный оптимизатор: SGD  
-----

```
Epoch 1/10 (Train): 100%|██████████| 1  
17/117 [00:17<00:00, 6.51sample/s]  
Epoch 1/10 (Eval): 100%|██████████| 1  
71/71 [00:04<00:00, 16.00sample/s]  
Epoch 1/10, Training Loss: 0.7400941212876682, Validation Loss: 0.7573388565731587  
Accuracy: 0.496045197740113, Precision: 0.4967992052802852, Recall: 0.496045197740113, F1-score: 0.41547186628059074  
Epoch 2/10 (Train): 100%|██████████| 1  
17/117 [00:17<00:00, 6.54sample/s]  
Epoch 2/10 (Eval): 100%|██████████| 1  
71/71 [00:04<00:00, 16.44sample/s]  
Epoch 2/10, Training Loss: 0.7364775099069636, Validation Loss: 0.7080721479687987  
Accuracy: 0.5214689265536723, Precision: 0.5217555779047193, Recall: 0.5214689265536723, F1-score: 0.5157121029048242  
Epoch 3/10 (Train): 100%|██████████| 1  
17/117 [00:17<00:00, 6.51sample/s]  
Epoch 3/10 (Eval): 100%|██████████| 1  
71/71 [00:04<00:00, 16.13sample/s]  
Epoch 3/10, Training Loss: 0.734518012970257, Validation Loss: 0.7039974018678827  
Accuracy: 0.515819209039548, Precision: 0.5197288755060102, Recall: 0.515819209039548, F1-score: 0.47748727245235917  
Epoch 4/10 (Train): 100%|██████████| 1  
17/117 [00:17<00:00, 6.51sample/s]  
Epoch 4/10 (Eval): 100%|██████████| 1  
71/71 [00:04<00:00, 16.19sample/s]  
Epoch 4/10, Training Loss: 0.7317799559352004, Validation Loss: 0.7009534674175715  
Accuracy: 0.5169491525423728, Precision: 0.516789272208975, Recall: 0.5169491525423728, F1-score: 0.5156740554675652  
Epoch 5/10 (Train): 100%|██████████| 1  
17/117 [00:17<00:00, 6.55sample/s]  
Epoch 5/10 (Eval): 100%|██████████| 1  
71/71 [00:04<00:00, 16.11sample/s]  
Epoch 5/10, Training Loss: 0.7274841100610716, Validation Loss: 0.7086629006317107  
Accuracy: 0.5344632768361582, Precision: 0.5639221818738014, Recall: 0.5344632768361582, F1-score: 0.47946429088801973  
Epoch 6/10 (Train): 100%|██████████| 1  
17/117 [00:17<00:00, 6.52sample/s]  
Epoch 6/10 (Eval): 100%|██████████| 1  
71/71 [00:04<00:00, 16.14sample/s]  
Epoch 6/10, Training Loss: 0.7270973303123563, Validation Loss: 0.6872609813334578  
Accuracy: 0.5435028248587571, Precision: 0.5437817888091682, Recall: 0.5435028248587571, F1-score: 0.5432748491423763
```

```
Epoch 7/10 (Train): 100%|██████████| 1  
17/117 [00:17<00:00, 6.53sample/s]  
Epoch 7/10 (Eval): 100%|██████████|  
71/71 [00:04<00:00, 16.30sample/s]  
Epoch 7/10, Training Loss: 0.7224766968087516, Validation Loss: 0.7080001558287669  
Accuracy: 0.5203389830508475, Precision: 0.5210345378957468, Recall: 0.5203389830508  
475, F1-score: 0.5106507803322705  
Epoch 8/10 (Train): 100%|██████████| 1  
17/117 [00:18<00:00, 6.50sample/s]  
Epoch 8/10 (Eval): 100%|██████████|  
71/71 [00:04<00:00, 16.38sample/s]  
Epoch 8/10, Training Loss: 0.7188056472476988, Validation Loss: 0.7053708989741438  
Accuracy: 0.5316384180790961, Precision: 0.5410959315355441, Recall: 0.5316384180790  
961, F1-score: 0.508166091766201  
Epoch 9/10 (Train): 100%|██████████| 1  
17/117 [00:17<00:00, 6.53sample/s]  
Epoch 9/10 (Eval): 100%|██████████|  
71/71 [00:04<00:00, 16.39sample/s]  
Epoch 00009: reducing learning rate of group 0 to 1.0000e-04.  
  
Epoch 9/10, Training Loss: 0.7305117916415373, Validation Loss: 0.8124601754259928  
Accuracy: 0.503954802259887, Precision: 0.5515148605175973, Recall: 0.50395480225988  
7, F1-score: 0.3403537591581141  
Epoch 10/10 (Train): 100%|██████████| 1  
17/117 [00:17<00:00, 6.51sample/s]  
Epoch 10/10 (Eval): 100%|██████████|  
71/71 [00:04<00:00, 16.36sample/s]  
Epoch 10/10, Training Loss: 0.7042304676146112, Validation Loss: 0.7024259072239116  
Accuracy: 0.519774011299435, Precision: 0.5321355129447705, Recall: 0.51977401129943  
5, F1-score: 0.47785975983629897  
Тренировка завершена!  
  
Test: 100%|██████████|  
72/72 [00:04<00:00, 14.89sample/s]  
Test Accuracy: 0.5195094760312151  
Precision: 0.5254267200526843, Recall: 0.5195094760312151, F1-score: 0.4773499798606  
963  
Accuracy of cats : 23 %  
Accuracy of dogs : 80 %  
  
Class_name: cats  
Train_count: 900  
Test_count: 300  
Valid_count: 300  
  
Shutil images: 100%|██████████| 150  
0/1500 [00:00<00:00, 1813.54image/s]  
Class_name: dogs  
Train_count: 900  
Test_count: 300  
Valid_count: 300  
  
Shutil images: 100%|██████████| 150  
0/1500 [00:00<00:00, 1812.20image/s]
```

-----  
Выбранная модель: resnet152  
Пользовательское название модели: resnet152\_Exp1  
Выбранный оптимизатор: SGD  
-----

```
Epoch 1/10 (Train): 100%|██████████| 1  
17/117 [00:24<00:00, 4.76sample/s]  
Epoch 1/10 (Eval): 100%|██████████| 1  
71/71 [00:05<00:00, 13.56sample/s]  
Epoch 1/10, Training Loss: 0.7277315076775057, Validation Loss: 0.9998796307771219  
Accuracy: 0.49887005649717514, Precision: 0.5995493066255778, Recall: 0.49887005649717514, F1-score: 0.3375152684752836  
Epoch 2/10 (Train): 100%|██████████| 1  
17/117 [00:24<00:00, 4.77sample/s]  
Epoch 2/10 (Eval): 100%|██████████| 1  
71/71 [00:05<00:00, 13.37sample/s]  
Epoch 2/10, Training Loss: 0.7419631587184399, Validation Loss: 0.9629280786056303  
Accuracy: 0.49830508474576274, Precision: 0.4813564054451193, Recall: 0.49830508474576274, F1-score: 0.3815275813840588  
Epoch 3/10 (Train): 100%|██████████| 1  
17/117 [00:24<00:00, 4.77sample/s]  
Epoch 3/10 (Eval): 100%|██████████| 1  
71/71 [00:05<00:00, 13.38sample/s]  
Epoch 3/10, Training Loss: 0.7360513930332179, Validation Loss: 1.0331299980144717  
Accuracy: 0.5005649717514125, Precision: 0.47760112153731227, Recall: 0.5005649717514125, F1-score: 0.35833878535015556  
Epoch 4/10 (Train): 100%|██████████| 1  
17/117 [00:24<00:00, 4.77sample/s]  
Epoch 4/10 (Eval): 100%|██████████| 1  
71/71 [00:05<00:00, 13.35sample/s]  
Epoch 4/10, Training Loss: 0.7321245450324764, Validation Loss: 0.9420360698875061  
Accuracy: 0.4937853107344633, Precision: 0.38319345544945604, Recall: 0.4937853107344633, F1-score: 0.3312843953024153  
Epoch 5/10 (Train): 100%|██████████| 1  
17/117 [00:24<00:00, 4.81sample/s]  
Epoch 5/10 (Eval): 100%|██████████| 1  
71/71 [00:05<00:00, 13.24sample/s]  
Epoch 5/10, Training Loss: 0.7268370068424609, Validation Loss: 0.7172598986134018  
Accuracy: 0.5112994350282486, Precision: 0.5469629432439573, Recall: 0.5112994350282486, F1-score: 0.4084827772075663  
Epoch 6/10 (Train): 100%|██████████| 1  
17/117 [00:24<00:00, 4.75sample/s]  
Epoch 6/10 (Eval): 100%|██████████| 1  
71/71 [00:05<00:00, 13.17sample/s]  
Epoch 6/10, Training Loss: 0.7338009465835615, Validation Loss: 0.8271091434746812  
Accuracy: 0.49887005649717514, Precision: 0.5707816024753595, Recall: 0.49887005649717514, F1-score: 0.3394522403205639
```

```
Epoch 7/10 (Train): 100%|██████████| 1  
17/117 [00:24<00:00, 4.79sample/s]  
Epoch 7/10 (Eval): 100%|██████████|  
71/71 [00:05<00:00, 13.20sample/s]  
Epoch 7/10, Training Loss: 0.7228990037446156, Validation Loss: 0.6931510606391281  
Accuracy: 0.5265536723163842, Precision: 0.5286598195244409, Recall: 0.5265536723163  
842, F1-score: 0.5125393828621845  
Epoch 8/10 (Train): 100%|██████████| 1  
17/117 [00:24<00:00, 4.76sample/s]  
Epoch 8/10 (Eval): 100%|██████████|  
71/71 [00:05<00:00, 13.27sample/s]  
Epoch 8/10, Training Loss: 0.7206251969723116, Validation Loss: 0.7288790655843282  
Accuracy: 0.5288135593220339, Precision: 0.5733083425442735, Recall: 0.5288135593220  
339, F1-score: 0.4507933090217283  
Epoch 9/10 (Train): 100%|██████████| 1  
17/117 [00:24<00:00, 4.78sample/s]  
Epoch 9/10 (Eval): 100%|██████████|  
71/71 [00:05<00:00, 13.30sample/s]  
Epoch 9/10, Training Loss: 0.7156010515032932, Validation Loss: 0.6973121341338939  
Accuracy: 0.5463276836158192, Precision: 0.5467825386980049, Recall: 0.5463276836158  
192, F1-score: 0.5439840386468041  
Epoch 10/10 (Train): 100%|██████████| 1  
17/117 [00:24<00:00, 4.83sample/s]  
Epoch 10/10 (Eval): 100%|██████████|  
71/71 [00:05<00:00, 13.48sample/s]  
Epoch 00010: reducing learning rate of group 0 to 1.0000e-04.  
  
Epoch 10/10, Training Loss: 0.7084280030215906, Validation Loss: 0.7216495943103133  
Accuracy: 0.5192090395480226, Precision: 0.6048411651273723, Recall: 0.5192090395480  
226, F1-score: 0.40192828675090125  
Тренировка завершена!  
Test: 100%|██████████|  
72/72 [00:05<00:00, 12.91sample/s]  
Test Accuracy: 0.5189520624303233  
Precision: 0.5737441302658695, Recall: 0.5189520624303233, F1-score: 0.3997844742558  
3313  
Accuracy of cats : 7 %  
Accuracy of dogs : 96 %  
  
Class_name: cats  
Train_count: 900  
Test_count: 300  
Valid_count: 300  
Shutil images: 100%|██████████| 150  
0/1500 [00:00<00:00, 1796.44image/s]  
Class_name: dogs  
Train_count: 900  
Test_count: 300  
Valid_count: 300  
Shutil images: 100%|██████████| 150  
0/1500 [00:00<00:00, 1775.83image/s]
```

-----  
Выбранная модель: resnet18  
Пользовательское название модели: resnet18\_Exp1  
Выбранный оптимизатор: SGD  
-----

```
Epoch 1/10 (Train): 100%|██████████| 1  
17/117 [00:08<00:00, 14.04sample/s]  
Epoch 1/10 (Eval): 100%|██████████| 1  
71/71 [00:03<00:00, 22.44sample/s]  
Epoch 1/10, Training Loss: 0.6961571662249509, Validation Loss: 0.6922361530826591  
Accuracy: 0.5333333333333333, Precision: 0.5353873108856799, Recall: 0.5333333333333333  
333, F1-score: 0.5228739175374933  
Epoch 2/10 (Train): 100%|██████████| 1  
17/117 [00:08<00:00, 14.46sample/s]  
Epoch 2/10 (Eval): 100%|██████████| 1  
71/71 [00:03<00:00, 22.50sample/s]  
Epoch 2/10, Training Loss: 0.6936974548533651, Validation Loss: 0.6835830159443247  
Accuracy: 0.5615819209039548, Precision: 0.5760030991869252, Recall: 0.5615819209039  
548, F1-score: 0.536944086861591  
Epoch 3/10 (Train): 100%|██████████| 1  
17/117 [00:08<00:00, 14.27sample/s]  
Epoch 3/10 (Eval): 100%|██████████| 1  
71/71 [00:03<00:00, 22.66sample/s]  
Epoch 3/10, Training Loss: 0.6839830874783932, Validation Loss: 0.6776367392243638  
Accuracy: 0.5717514124293785, Precision: 0.5805375178950687, Recall: 0.5717514124293  
785, F1-score: 0.5578236180749946  
Epoch 4/10 (Train): 100%|██████████| 1  
17/117 [00:08<00:00, 14.45sample/s]  
Epoch 4/10 (Eval): 100%|██████████| 1  
71/71 [00:03<00:00, 22.94sample/s]  
Epoch 4/10, Training Loss: 0.6830748128024906, Validation Loss: 0.6769387489658291  
Accuracy: 0.5909604519774011, Precision: 0.6094401599334583, Recall: 0.5909604519774  
011, F1-score: 0.5711707451668823  
Epoch 5/10 (Train): 100%|██████████| 1  
17/117 [00:08<00:00, 14.31sample/s]  
Epoch 5/10 (Eval): 100%|██████████| 1  
71/71 [00:03<00:00, 22.82sample/s]  
Epoch 5/10, Training Loss: 0.6677061106098114, Validation Loss: 0.6633121763582284  
Accuracy: 0.6056497175141243, Precision: 0.6075158638689385, Recall: 0.6056497175141  
243, F1-score: 0.6033798568960834  
Epoch 6/10 (Train): 100%|██████████| 1  
17/117 [00:08<00:00, 14.46sample/s]  
Epoch 6/10 (Eval): 100%|██████████| 1  
71/71 [00:03<00:00, 22.91sample/s]  
Epoch 6/10, Training Loss: 0.6682416823034503, Validation Loss: 0.6558640365209957  
Accuracy: 0.6073446327683616, Precision: 0.6139303932141047, Recall: 0.6073446327683  
616, F1-score: 0.6006587076723805
```

```
Epoch 7/10 (Train): 100%|██████████| 1  
17/117 [00:08<00:00, 14.44sample/s]  
Epoch 7/10 (Eval): 100%|██████████|  
71/71 [00:03<00:00, 22.97sample/s]  
Epoch 7/10, Training Loss: 0.6619912133059982, Validation Loss: 0.6519562967416257  
Accuracy: 0.6333333333333333, Precision: 0.6474730900498818, Recall: 0.6333333333333333  
333, F1-score: 0.6234257975990557  
Epoch 8/10 (Train): 100%|██████████| 1  
17/117 [00:08<00:00, 14.46sample/s]  
Epoch 8/10 (Eval): 100%|██████████|  
71/71 [00:03<00:00, 22.61sample/s]  
Epoch 8/10, Training Loss: 0.6589739292635339, Validation Loss: 0.6444231847585258  
Accuracy: 0.6474576271186441, Precision: 0.6482503440389957, Recall: 0.6474576271186  
441, F1-score: 0.6471571966032053  
Epoch 9/10 (Train): 100%|██████████| 1  
17/117 [00:08<00:00, 14.32sample/s]  
Epoch 9/10 (Eval): 100%|██████████|  
71/71 [00:03<00:00, 22.59sample/s]  
Epoch 9/10, Training Loss: 0.6541478692504786, Validation Loss: 0.6362218749051713  
Accuracy: 0.6468926553672316, Precision: 0.6504416128349456, Recall: 0.6468926553672  
316, F1-score: 0.6443751452409688  
Epoch 10/10 (Train): 100%|██████████| 1  
17/117 [00:08<00:00, 14.32sample/s]  
Epoch 10/10 (Eval): 100%|██████████|  
71/71 [00:03<00:00, 22.42sample/s]  
Epoch 10/10, Training Loss: 0.652756024011608, Validation Loss: 0.628857688715229  
Accuracy: 0.6604519774011299, Precision: 0.660853828096927, Recall: 0.66045197740112  
99, F1-score: 0.660103306306558  
Тренировка завершена!  
Test: 100%|██████████|  
72/72 [00:04<00:00, 17.18sample/s]  
Test Accuracy: 0.6839464882943144  
Precision: 0.6853010607282528, Recall: 0.6839464882943144, F1-score: 0.6835486674018  
21  
Accuracy of cats : 72 %  
Accuracy of dogs : 64 %  
  
Class_name: cats  
Train_count: 900  
Test_count: 300  
Valid_count: 300  
Shutil images: 100%|██████████| 150  
0/1500 [00:00<00:00, 1816.99image/s]  
Class_name: dogs  
Train_count: 900  
Test_count: 300  
Valid_count: 300  
Shutil images: 100%|██████████| 150  
0/1500 [00:00<00:00, 1822.44image/s]
```

-----  
Выбранная модель: resnet34  
Пользовательское название модели: resnet34\_Exp1  
Выбранный оптимизатор: SGD  
-----

```
Epoch 1/10 (Train): 100%|██████████| 1  
17/117 [00:09<00:00, 12.01sample/s]  
Epoch 1/10 (Eval): 100%|██████████| 1  
71/71 [00:03<00:00, 21.75sample/s]  
Epoch 1/10, Training Loss: 0.7010706133062992, Validation Loss: 0.6951434299097223  
Accuracy: 0.5316384180790961, Precision: 0.5321251711888282, Recall: 0.5316384180790961, F1-score: 0.5274342939860114  
Epoch 2/10 (Train): 100%|██████████| 1  
17/117 [00:09<00:00, 12.09sample/s]  
Epoch 2/10 (Eval): 100%|██████████| 1  
71/71 [00:03<00:00, 21.59sample/s]  
Epoch 2/10, Training Loss: 0.7009102355706683, Validation Loss: 0.6978756783709015  
Accuracy: 0.5265536723163842, Precision: 0.5326024811915433, Recall: 0.5265536723163842, F1-score: 0.4965170448635814  
Epoch 3/10 (Train): 100%|██████████| 1  
17/117 [00:09<00:00, 12.14sample/s]  
Epoch 3/10 (Eval): 100%|██████████| 1  
71/71 [00:03<00:00, 21.61sample/s]  
Epoch 3/10, Training Loss: 0.6988084037635651, Validation Loss: 0.6851722540828468  
Accuracy: 0.5514124293785311, Precision: 0.5532177229102371, Recall: 0.5514124293785311, F1-score: 0.5458444292386738  
Epoch 4/10 (Train): 100%|██████████| 1  
17/117 [00:09<00:00, 12.15sample/s]  
Epoch 4/10 (Eval): 100%|██████████| 1  
71/71 [00:03<00:00, 21.66sample/s]  
Epoch 4/10, Training Loss: 0.6891447173315339, Validation Loss: 0.6846099125463411  
Accuracy: 0.5514124293785311, Precision: 0.5525645193476623, Recall: 0.5514124293785311, F1-score: 0.5499234964607956  
Epoch 5/10 (Train): 100%|██████████| 1  
17/117 [00:09<00:00, 12.16sample/s]  
Epoch 5/10 (Eval): 100%|██████████| 1  
71/71 [00:03<00:00, 21.76sample/s]  
Epoch 5/10, Training Loss: 0.6903968810463214, Validation Loss: 0.6785258761907028  
Accuracy: 0.5711864406779661, Precision: 0.5730258272800646, Recall: 0.5711864406779661, F1-score: 0.5674299030350076  
Epoch 6/10 (Train): 100%|██████████| 1  
17/117 [00:09<00:00, 12.37sample/s]  
Epoch 6/10 (Eval): 100%|██████████| 1  
71/71 [00:03<00:00, 21.89sample/s]  
Epoch 6/10, Training Loss: 0.6917545624266266, Validation Loss: 0.6835671447764682  
Accuracy: 0.5581920903954802, Precision: 0.6047285230122, Recall: 0.5581920903954802, F1-score: 0.49937739627812205
```

```
Epoch 7/10 (Train): 100%|██████████| 1  
17/117 [00:09<00:00, 12.11sample/s]  
Epoch 7/10 (Eval): 100%|██████████| 1  
71/71 [00:03<00:00, 21.97sample/s]  
Epoch 7/10, Training Loss: 0.6872621719113272, Validation Loss: 0.6729390755885065  
Accuracy: 0.572316384180791, Precision: 0.5751320314419062, Recall: 0.572316384180791, F1-score: 0.5670626159883497  
Epoch 8/10 (Train): 100%|██████████| 1  
17/117 [00:09<00:00, 12.19sample/s]  
Epoch 8/10 (Eval): 100%|██████████| 1  
71/71 [00:03<00:00, 21.71sample/s]  
Epoch 8/10, Training Loss: 0.684322657835982, Validation Loss: 0.6686451118544671  
Accuracy: 0.5977401129943503, Precision: 0.5993106876480141, Recall: 0.5977401129943503, F1-score: 0.5955619399845342  
Epoch 9/10 (Train): 100%|██████████| 1  
17/117 [00:09<00:00, 12.12sample/s]  
Epoch 9/10 (Eval): 100%|██████████| 1  
71/71 [00:03<00:00, 21.89sample/s]  
Epoch 9/10, Training Loss: 0.6773512418789762, Validation Loss: 0.6654557491426414  
Accuracy: 0.5926553672316384, Precision: 0.6074393306079953, Recall: 0.5926553672316384, F1-score: 0.5765509227312168  
Epoch 10/10 (Train): 100%|██████████| 1  
17/117 [00:09<00:00, 12.15sample/s]  
Epoch 10/10 (Eval): 100%|██████████| 1  
71/71 [00:03<00:00, 21.77sample/s]  
Epoch 10/10, Training Loss: 0.6753158319519349, Validation Loss: 0.6568103888950779  
Accuracy: 0.6152542372881356, Precision: 0.6177548265724997, Recall: 0.6152542372881356, F1-score: 0.6126577190378937  
Тренировка завершена!  
Test: 100%|██████████| 1  
72/72 [00:03<00:00, 18.44sample/s]  
Test Accuracy: 0.617056856187291  
Precision: 0.6216027288999576, Recall: 0.617056856187291, F1-score: 0.61414701378403  
24  
Accuracy of cats : 70 %  
Accuracy of dogs : 52 %  
  
Class_name: cats  
Train_count: 900  
Test_count: 300  
Valid_count: 300  
Shutil images: 100%|██████████| 150  
0/1500 [00:00<00:00, 1835.88image/s]  
Class_name: dogs  
Train_count: 900  
Test_count: 300  
Valid_count: 300  
Shutil images: 100%|██████████| 150  
0/1500 [00:00<00:00, 1844.58image/s]
```

-----  
Выбранная модель: resnet50  
Пользовательское название модели: resnet50\_Exp1  
Выбранный оптимизатор: SGD  
-----

```
Epoch 1/10 (Train): 100%|██████████| 1  
17/117 [00:11<00:00, 10.31sample/s]  
Epoch 1/10 (Eval): 100%|██████████| 1  
71/71 [00:03<00:00, 20.33sample/s]  
Epoch 1/10, Training Loss: 0.7381236234129578, Validation Loss: 0.7148882777003919  
Accuracy: 0.5016949152542373, Precision: 0.4991397530460392, Recall: 0.5016949152542  
373, F1-score: 0.4425333846944016  
Epoch 2/10 (Train): 100%|██████████| 1  
17/117 [00:11<00:00, 10.45sample/s]  
Epoch 2/10 (Eval): 100%|██████████| 1  
71/71 [00:03<00:00, 20.34sample/s]  
Epoch 2/10, Training Loss: 0.7334028955311543, Validation Loss: 0.708401324722053  
Accuracy: 0.5141242937853108, Precision: 0.5204617811582166, Recall: 0.5141242937853  
108, F1-score: 0.484896673093101  
Epoch 3/10 (Train): 100%|██████████| 1  
17/117 [00:11<00:00, 10.31sample/s]  
Epoch 3/10 (Eval): 100%|██████████| 1  
71/71 [00:03<00:00, 20.18sample/s]  
Epoch 3/10, Training Loss: 0.7331531307442373, Validation Loss: 0.7228622779165957  
Accuracy: 0.5033898305084745, Precision: 0.5119854721549637, Recall: 0.5033898305084  
745, F1-score: 0.43076757330621634  
Epoch 4/10 (Train): 100%|██████████| 1  
17/117 [00:11<00:00, 10.24sample/s]  
Epoch 4/10 (Eval): 100%|██████████| 1  
71/71 [00:03<00:00, 20.38sample/s]  
Epoch 4/10, Training Loss: 0.7255641703862209, Validation Loss: 0.7085027915273009  
Accuracy: 0.5, Precision: 0.49833008499142684, Recall: 0.5, F1-score: 0.477511138961  
53036  
Epoch 5/10 (Train): 100%|██████████| 1  
17/117 [00:11<00:00, 10.41sample/s]  
Epoch 5/10 (Eval): 100%|██████████| 1  
71/71 [00:03<00:00, 20.45sample/s]  
Epoch 5/10, Training Loss: 0.7321429090233516, Validation Loss: 0.7043123413613961  
Accuracy: 0.5062146892655367, Precision: 0.5091180045103317, Recall: 0.5062146892655  
367, F1-score: 0.48518849837203426  
Epoch 6/10 (Train): 100%|██████████| 1  
17/117 [00:10<00:00, 10.75sample/s]  
Epoch 6/10 (Eval): 100%|██████████| 1  
71/71 [00:03<00:00, 20.40sample/s]  
Epoch 6/10, Training Loss: 0.725281107151974, Validation Loss: 0.7007562287446469  
Accuracy: 0.5333333333333333, Precision: 0.5423606749570825, Recall: 0.5333333333333  
333, F1-score: 0.5118049553442812
```

```
Epoch 7/10 (Train): 100%|██████████| 1  
17/117 [00:11<00:00, 10.41sample/s]  
Epoch 7/10 (Eval): 100%|██████████|  
71/71 [00:03<00:00, 20.53sample/s]  
Epoch 7/10, Training Loss: 0.734663873951757, Validation Loss: 0.6898952298245188  
Accuracy: 0.5384180790960452, Precision: 0.5387441920502334, Recall: 0.5384180790960452, F1-score: 0.5380977509701222  
Epoch 8/10 (Train): 100%|██████████| 1  
17/117 [00:11<00:00, 10.32sample/s]  
Epoch 8/10 (Eval): 100%|██████████|  
71/71 [00:03<00:00, 20.29sample/s]  
Epoch 8/10, Training Loss: 0.7294000920324476, Validation Loss: 0.7783152807061955  
Accuracy: 0.4994350282485876, Precision: 0.6388434922376539, Recall: 0.4994350282485876, F1-score: 0.3377752953261428  
Epoch 9/10 (Train): 100%|██████████| 1  
17/117 [00:11<00:00, 10.59sample/s]  
Epoch 9/10 (Eval): 100%|██████████|  
71/71 [00:03<00:00, 20.33sample/s]  
Epoch 9/10, Training Loss: 0.7248427196673288, Validation Loss: 0.6903718758774342  
Accuracy: 0.5288135593220339, Precision: 0.529360288229842, Recall: 0.5288135593220339, F1-score: 0.5236677554523204  
Epoch 10/10 (Train): 100%|██████████| 1  
17/117 [00:11<00:00, 10.39sample/s]  
Epoch 10/10 (Eval): 100%|██████████|  
71/71 [00:03<00:00, 20.07sample/s]  
Epoch 00010: reducing learning rate of group 0 to 1.0000e-04.  
  
Epoch 10/10, Training Loss: 0.7385139200195537, Validation Loss: 0.6920438440842817  
Accuracy: 0.5384180790960452, Precision: 0.539819166057758, Recall: 0.5384180790960452, F1-score: 0.5359597305526114  
Тренировка завершена!  
Test: 100%|██████████|  
72/72 [00:04<00:00, 17.61sample/s]  
Test Accuracy: 0.5228539576365663  
Precision: 0.5227433843254569, Recall: 0.5228539576365663, F1-score: 0.5207514256153606  
Accuracy of cats : 45 %  
Accuracy of dogs : 58 %  
  
Class_name: cats  
Train_count: 900  
Test_count: 300  
Valid_count: 300  
Shutil images: 100%|██████████| 150  
0/1500 [00:00<00:00, 1819.11image/s]  
Class_name: dogs  
Train_count: 900  
Test_count: 300  
Valid_count: 300  
Shutil images: 100%|██████████| 150  
0/1500 [00:00<00:00, 1798.68image/s]
```

-----  
Выбранная модель: resnext101\_64x4d  
Пользовательское название модели: resnext101\_64x4d\_Exp1  
Выбранный оптимизатор: SGD  
-----

```
Epoch 1/10 (Train): 100%|██████████| 1  
17/117 [00:26<00:00, 4.34sample/s]  
Epoch 1/10 (Eval): 100%|██████████|  
71/71 [00:05<00:00, 12.87sample/s]  
Epoch 1/10, Training Loss: 0.7407547590706428, Validation Loss: 0.8274358299660818  
Accuracy: 0.5073446327683616, Precision: 0.5105711974349735, Recall: 0.5073446327683  
616, F1-score: 0.4297827825473126  
Epoch 2/10 (Train): 100%|██████████| 1  
17/117 [00:26<00:00, 4.35sample/s]  
Epoch 2/10 (Eval): 100%|██████████|  
71/71 [00:05<00:00, 12.83sample/s]  
Epoch 2/10, Training Loss: 0.7376215350064127, Validation Loss: 0.7885475609935609  
Accuracy: 0.5169491525423728, Precision: 0.5367802249146097, Recall: 0.5169491525423  
728, F1-score: 0.4292256021382131  
Epoch 3/10 (Train): 100%|██████████| 1  
17/117 [00:26<00:00, 4.36sample/s]  
Epoch 3/10 (Eval): 100%|██████████|  
71/71 [00:05<00:00, 12.84sample/s]  
Epoch 3/10, Training Loss: 0.7340826973717371, Validation Loss: 0.7002047655609368  
Accuracy: 0.5497175141242938, Precision: 0.5594506148214108, Recall: 0.5497175141242  
938, F1-score: 0.5334265629336895  
Epoch 4/10 (Train): 100%|██████████| 1  
17/117 [00:27<00:00, 4.27sample/s]  
Epoch 4/10 (Eval): 100%|██████████|  
71/71 [00:05<00:00, 12.74sample/s]  
Epoch 4/10, Training Loss: 0.7225184251258764, Validation Loss: 0.725335543017603  
Accuracy: 0.5310734463276836, Precision: 0.6091931797390553, Recall: 0.5310734463276  
836, F1-score: 0.43402071278025056  
Epoch 5/10 (Train): 100%|██████████| 1  
17/117 [00:27<00:00, 4.30sample/s]  
Epoch 5/10 (Eval): 100%|██████████|  
71/71 [00:05<00:00, 12.72sample/s]  
Epoch 5/10, Training Loss: 0.7359449540490235, Validation Loss: 0.6951378333029774  
Accuracy: 0.523728813559322, Precision: 0.5238711465908944, Recall: 0.52372881355932  
2, F1-score: 0.5236392620074296  
Epoch 6/10 (Train): 100%|██████████| 1  
17/117 [00:27<00:00, 4.22sample/s]  
Epoch 6/10 (Eval): 100%|██████████|  
71/71 [00:05<00:00, 12.73sample/s]  
Epoch 6/10, Training Loss: 0.72328442570034, Validation Loss: 0.697795070834079  
Accuracy: 0.5310734463276836, Precision: 0.5311815135026099, Recall: 0.5310734463276  
836, F1-score: 0.5289125194253084
```

```
Epoch 7/10 (Train): 100%|██████████| 1  
17/117 [00:27<00:00, 4.27sample/s]  
Epoch 7/10 (Eval): 100%|██████████|  
71/71 [00:05<00:00, 12.55sample/s]  
Epoch 7/10, Training Loss: 0.731402278130311, Validation Loss: 0.718008385455541  
Accuracy: 0.5203389830508475, Precision: 0.5528567523236741, Recall: 0.5203389830508475, F1-score: 0.4417429213527238  
Epoch 8/10 (Train): 100%|██████████| 1  
17/117 [00:26<00:00, 4.45sample/s]  
Epoch 8/10 (Eval): 100%|██████████|  
71/71 [00:05<00:00, 12.71sample/s]  
Epoch 00008: reducing learning rate of group 0 to 1.0000e-04.  
  
Epoch 8/10, Training Loss: 0.7165541671946737, Validation Loss: 0.7972859970088733  
Accuracy: 0.5090395480225989, Precision: 0.6552455378961155, Recall: 0.5090395480225989, F1-score: 0.3629493574645223  
Epoch 9/10 (Train): 100%|██████████| 1  
17/117 [00:26<00:00, 4.48sample/s]  
Epoch 9/10 (Eval): 100%|██████████|  
71/71 [00:05<00:00, 12.76sample/s]  
Epoch 9/10, Training Loss: 0.7009737820270701, Validation Loss: 0.690872968085068  
Accuracy: 0.5401129943502825, Precision: 0.5439996862542872, Recall: 0.5401129943502825, F1-score: 0.532365528333278  
Epoch 10/10 (Train): 100%|██████████| 1  
17/117 [00:25<00:00, 4.54sample/s]  
Epoch 10/10 (Eval): 100%|██████████|  
71/71 [00:05<00:00, 12.79sample/s]  
Epoch 10/10, Training Loss: 0.6914596857274534, Validation Loss: 0.68251897049489  
Accuracy: 0.5655367231638418, Precision: 0.5833480445002158, Recall: 0.5655367231638418, F1-score: 0.5435262969628271  
Тренировка завершена!  
  
Test: 100%|██████████|  
72/72 [00:05<00:00, 12.50sample/s]  
Test Accuracy: 0.5674470457079153  
Precision: 0.5814776888098574, Recall: 0.5674470457079153, F1-score: 0.5451399635736465  
Accuracy of cats : 34 %  
Accuracy of dogs : 78 %  
  
Class_name: cats  
Train_count: 900  
Test_count: 300  
Valid_count: 300  
  
Shutil images: 100%|██████████| 150  
0/1500 [00:00<00:00, 1809.09image/s]  
Class_name: dogs  
Train_count: 900  
Test_count: 300  
Valid_count: 300  
  
Shutil images: 100%|██████████| 150  
0/1500 [00:00<00:00, 1799.29image/s]
```

-----  
Выбранная модель: resnext50\_32x4d  
Пользовательское название модели: resnext50\_32x4d\_Exp1  
Выбранный оптимизатор: SGD  
-----

```
Epoch 1/10 (Train): 100%|██████████| 1  
17/117 [00:12<00:00, 9.07sample/s]  
Epoch 1/10 (Eval): 100%|██████████| 1  
71/71 [00:03<00:00, 18.82sample/s]  
Epoch 1/10, Training Loss: 0.739819008553167, Validation Loss: 0.7689231872390219  
Accuracy: 0.49548022598870056, Precision: 0.49316193405451275, Recall: 0.49548022598  
870056, F1-score: 0.3747305915293151  
Epoch 2/10 (Train): 100%|██████████| 1  
17/117 [00:12<00:00, 9.20sample/s]  
Epoch 2/10 (Eval): 100%|██████████| 1  
71/71 [00:03<00:00, 19.59sample/s]  
Epoch 2/10, Training Loss: 0.7281472866178947, Validation Loss: 0.7111897343969614  
Accuracy: 0.5225988700564972, Precision: 0.5245626796190835, Recall: 0.5225988700564  
972, F1-score: 0.5168642270807215  
Epoch 3/10 (Train): 100%|██████████| 1  
17/117 [00:12<00:00, 9.08sample/s]  
Epoch 3/10 (Eval): 100%|██████████| 1  
71/71 [00:03<00:00, 19.47sample/s]  
Epoch 3/10, Training Loss: 0.733738578636406, Validation Loss: 0.7320656481772493  
Accuracy: 0.5163841807909605, Precision: 0.5367586704491358, Recall: 0.5163841807909  
605, F1-score: 0.4258281920447965  
Epoch 4/10 (Train): 100%|██████████| 1  
17/117 [00:12<00:00, 9.04sample/s]  
Epoch 4/10 (Eval): 100%|██████████| 1  
71/71 [00:03<00:00, 19.51sample/s]  
Epoch 4/10, Training Loss: 0.7352929007034746, Validation Loss: 0.7470078448959663  
Accuracy: 0.5096045197740113, Precision: 0.5681629441178381, Recall: 0.5096045197740  
113, F1-score: 0.38497821764850604  
Epoch 5/10 (Train): 100%|██████████| 1  
17/117 [00:12<00:00, 9.27sample/s]  
Epoch 5/10 (Eval): 100%|██████████| 1  
71/71 [00:03<00:00, 19.49sample/s]  
Epoch 5/10, Training Loss: 0.723399359939685, Validation Loss: 0.7045939837471914  
Accuracy: 0.5209039548022599, Precision: 0.5326251983154213, Recall: 0.5209039548022  
599, F1-score: 0.46313359055582304  
Epoch 6/10 (Train): 100%|██████████| 1  
17/117 [00:13<00:00, 8.94sample/s]  
Epoch 6/10 (Eval): 100%|██████████| 1  
71/71 [00:03<00:00, 19.50sample/s]  
Epoch 6/10, Training Loss: 0.7216319481422837, Validation Loss: 0.7177000278975331  
Accuracy: 0.5163841807909605, Precision: 0.5300411717926821, Recall: 0.5163841807909  
605, F1-score: 0.44078549989151544
```

```
Epoch 7/10 (Train): 100%|██████████| 1  
17/117 [00:12<00:00, 9.19sample/s]  
Epoch 7/10 (Eval): 100%|██████████|  
71/71 [00:03<00:00, 19.33sample/s]  
Epoch 7/10, Training Loss: 0.7271928768643293, Validation Loss: 0.7399071441531855  
Accuracy: 0.5186440677966102, Precision: 0.5487877662458465, Recall: 0.5186440677966  
102, F1-score: 0.4203096601618289  
Epoch 8/10 (Train): 100%|██████████| 1  
17/117 [00:12<00:00, 9.23sample/s]  
Epoch 8/10 (Eval): 100%|██████████|  
71/71 [00:03<00:00, 19.46sample/s]  
Epoch 00008: reducing learning rate of group 0 to 1.0000e-04.  
  
Epoch 8/10, Training Loss: 0.7394271749923946, Validation Loss: 0.7152503363493472  
Accuracy: 0.5265536723163842, Precision: 0.5685718815671004, Recall: 0.5265536723163  
842, F1-score: 0.4336234496124433  
Epoch 9/10 (Train): 100%|██████████| 1  
17/117 [00:12<00:00, 9.66sample/s]  
Epoch 9/10 (Eval): 100%|██████████|  
71/71 [00:03<00:00, 19.43sample/s]  
Epoch 9/10, Training Loss: 0.705687648368421, Validation Loss: 0.69616018631364  
Accuracy: 0.5299435028248588, Precision: 0.5307412890545383, Recall: 0.5299435028248  
588, F1-score: 0.5285040428503316  
Epoch 10/10 (Train): 100%|██████████| 1  
17/117 [00:12<00:00, 9.38sample/s]  
Epoch 10/10 (Eval): 100%|██████████|  
71/71 [00:03<00:00, 19.55sample/s]  
Epoch 10/10, Training Loss: 0.7058970830349011, Validation Loss: 0.697260928524416  
Accuracy: 0.5146892655367231, Precision: 0.5154434774518759, Recall: 0.5146892655367  
231, F1-score: 0.5125659584653024  
Тренировка завершена!  
  
Test: 100%|██████████|  
72/72 [00:04<00:00, 17.19sample/s]  
Test Accuracy: 0.5222965440356745  
Precision: 0.5222459825553527, Recall: 0.5222965440356745, F1-score: 0.5192041222185  
603  
Accuracy of cats : 44 %  
Accuracy of dogs : 60 %  
  
Class_name: cats  
Train_count: 900  
Test_count: 300  
Valid_count: 300  
Shutil images: 100%|██████████| 150  
0/1500 [00:00<00:00, 1781.66image/s]  
Class_name: dogs  
Train_count: 900  
Test_count: 300  
Valid_count: 300  
Shutil images: 100%|██████████| 150  
0/1500 [00:00<00:00, 1803.16image/s]
```

-----  
Выбранная модель: shufflenet\_v2\_x0\_5  
Пользовательское название модели: shufflenet\_v2\_x0\_5\_Exp1  
Выбранный оптимизатор: AdamW  
-----

```
Epoch 1/10 (Train): 100%|██████████| 1  
17/117 [00:12<00:00, 9.46sample/s]  
Epoch 1/10 (Eval): 100%|██████████| 1  
71/71 [00:03<00:00, 22.16sample/s]  
Epoch 1/10, Training Loss: 0.7360411258778236, Validation Loss: 0.7285241467804559  
Accuracy: 0.5152542372881356, Precision: 0.5437053162632388, Recall: 0.5152542372881356, F1-score: 0.4088062507161505  
Epoch 2/10 (Train): 100%|██████████| 1  
17/117 [00:12<00:00, 9.35sample/s]  
Epoch 2/10 (Eval): 100%|██████████| 1  
71/71 [00:03<00:00, 21.52sample/s]  
Epoch 2/10, Training Loss: 0.7069655941356282, Validation Loss: 0.6993967101062085  
Accuracy: 0.5073446327683616, Precision: 0.5085659214238963, Recall: 0.5073446327683616, F1-score: 0.501112041989789  
Epoch 3/10 (Train): 100%|██████████| 1  
17/117 [00:12<00:00, 9.51sample/s]  
Epoch 3/10 (Eval): 100%|██████████| 1  
71/71 [00:03<00:00, 21.73sample/s]  
Epoch 3/10, Training Loss: 0.7122680165123825, Validation Loss: 0.7091181907950148  
Accuracy: 0.5129943502824859, Precision: 0.5216227112393753, Recall: 0.5129943502824859, F1-score: 0.4411193050305991  
Epoch 4/10 (Train): 100%|██████████| 1  
17/117 [00:12<00:00, 9.43sample/s]  
Epoch 4/10 (Eval): 100%|██████████| 1  
71/71 [00:03<00:00, 21.66sample/s]  
Epoch 4/10, Training Loss: 0.7065184940370164, Validation Loss: 0.6937691315082507  
Accuracy: 0.5378531073446328, Precision: 0.56246130071439, Recall: 0.5378531073446328, F1-score: 0.4924417317067565  
Epoch 5/10 (Train): 100%|██████████| 1  
17/117 [00:12<00:00, 9.41sample/s]  
Epoch 5/10 (Eval): 100%|██████████| 1  
71/71 [00:03<00:00, 21.67sample/s]  
Epoch 5/10, Training Loss: 0.6918194110749764, Validation Loss: 0.6802971184590442  
Accuracy: 0.5666666666666666, Precision: 0.5687650118005807, Recall: 0.5666666666666667, F1-score: 0.5642861152769647  
Epoch 6/10 (Train): 100%|██████████| 1  
17/117 [00:12<00:00, 9.52sample/s]  
Epoch 6/10 (Eval): 100%|██████████| 1  
71/71 [00:03<00:00, 22.03sample/s]  
Epoch 6/10, Training Loss: 0.7030764811859301, Validation Loss: 0.7139400896211129  
Accuracy: 0.5372881355932203, Precision: 0.659834568151832, Recall: 0.5372881355932203, F1-score: 0.42356932562211325
```

```
Epoch 7/10 (Train): 100%|██████████| 1  
17/117 [00:12<00:00, 9.56sample/s]  
Epoch 7/10 (Eval): 100%|██████████|  
71/71 [00:03<00:00, 22.15sample/s]  
Epoch 7/10, Training Loss: 0.6831020484483756, Validation Loss: 0.6513859856936891  
Accuracy: 0.6231638418079096, Precision: 0.6433322018378378, Recall: 0.6231638418079096, F1-score: 0.6105330247672288  
Epoch 8/10 (Train): 100%|██████████| 1  
17/117 [00:12<00:00, 9.40sample/s]  
Epoch 8/10 (Eval): 100%|██████████|  
71/71 [00:03<00:00, 22.06sample/s]  
Epoch 8/10, Training Loss: 0.675518575925546, Validation Loss: 0.7045460951193577  
Accuracy: 0.5423728813559322, Precision: 0.6190872468273949, Recall: 0.5423728813559322, F1-score: 0.4501187744458931  
Epoch 9/10 (Train): 100%|██████████| 1  
17/117 [00:12<00:00, 9.35sample/s]  
Epoch 9/10 (Eval): 100%|██████████|  
71/71 [00:03<00:00, 22.07sample/s]  
Epoch 9/10, Training Loss: 0.6791915584705397, Validation Loss: 0.6599096421804805  
Accuracy: 0.6293785310734463, Precision: 0.6346936703691834, Recall: 0.6293785310734463, F1-score: 0.6250592026634861  
Epoch 10/10 (Train): 100%|██████████| 1  
17/117 [00:12<00:00, 9.47sample/s]  
Epoch 10/10 (Eval): 100%|██████████|  
71/71 [00:03<00:00, 22.16sample/s]  
Epoch 00010: reducing learning rate of group 0 to 1.0000e-04.  
Epoch 10/10, Training Loss: 0.6796759600873022, Validation Loss: 0.6761546730153305  
Accuracy: 0.5531073446327683, Precision: 0.6784508005742288, Recall: 0.5531073446327683, F1-score: 0.45465168593068733  
Тренировка завершена!  
Test: 100%|██████████|  
72/72 [00:03<00:00, 20.27sample/s]  
Test Accuracy: 0.5462653288740246  
Precision: 0.6781024063671323, Recall: 0.5462653288740246, F1-score: 0.4471132625934346  
Accuracy of cats : 97 %  
Accuracy of dogs : 12 %  
  
Class_name: cats  
Train_count: 900  
Test_count: 300  
Valid_count: 300  
Shutil images: 100%|██████████| 150  
0/1500 [00:00<00:00, 1768.52image/s]  
Class_name: dogs  
Train_count: 900  
Test_count: 300  
Valid_count: 300  
Shutil images: 100%|██████████| 150  
0/1500 [00:00<00:00, 1845.50image/s]
```

-----  
Выбранная модель: shufflenet\_v2\_x1\_0  
Пользовательское название модели: shufflenet\_v2\_x1\_0\_Exp1  
Выбранный оптимизатор: AdamW  
-----

```
Epoch 1/10 (Train): 100%|██████████| 1  
17/117 [00:12<00:00, 9.38sample/s]  
Epoch 1/10 (Eval): 100%|██████████| 1  
71/71 [00:03<00:00, 21.92sample/s]  
Epoch 1/10, Training Loss: 0.750585557337572, Validation Loss: 0.6882925915852779  
Accuracy: 0.5401129943502825, Precision: 0.5483601088107174, Recall: 0.5401129943502  
825, F1-score: 0.5153273546296595  
Epoch 2/10 (Train): 100%|██████████| 1  
17/117 [00:12<00:00, 9.41sample/s]  
Epoch 2/10 (Eval): 100%|██████████| 1  
71/71 [00:03<00:00, 21.95sample/s]  
Epoch 2/10, Training Loss: 0.693325284942525, Validation Loss: 0.6667516164186984  
Accuracy: 0.603954802259887, Precision: 0.6451439392001729, Recall: 0.60395480225988  
7, F1-score: 0.5754596705407383  
Epoch 3/10 (Train): 100%|██████████| 1  
17/117 [00:12<00:00, 9.45sample/s]  
Epoch 3/10 (Eval): 100%|██████████| 1  
71/71 [00:03<00:00, 22.08sample/s]  
Epoch 3/10, Training Loss: 0.6748613681978686, Validation Loss: 0.6348776203595986  
Accuracy: 0.6440677966101694, Precision: 0.6781589704918607, Recall: 0.6440677966101  
694, F1-score: 0.6250865611701562  
Epoch 4/10 (Train): 100%|██████████| 1  
17/117 [00:12<00:00, 9.35sample/s]  
Epoch 4/10 (Eval): 100%|██████████| 1  
71/71 [00:03<00:00, 22.25sample/s]  
Epoch 4/10, Training Loss: 0.6756123295992184, Validation Loss: 0.6215105568621792  
Accuracy: 0.6677966101694915, Precision: 0.6952240658779851, Recall: 0.6677966101694  
915, F1-score: 0.6548993628240201  
Epoch 5/10 (Train): 100%|██████████| 1  
17/117 [00:12<00:00, 9.26sample/s]  
Epoch 5/10 (Eval): 100%|██████████| 1  
71/71 [00:03<00:00, 22.12sample/s]  
Epoch 5/10, Training Loss: 0.6416678178220517, Validation Loss: 0.623534632015363  
Accuracy: 0.63954802259887, Precision: 0.722008705568188, Recall: 0.63954802259887,  
F1-score: 0.6012490816458135  
Epoch 6/10 (Train): 100%|██████████| 1  
17/117 [00:12<00:00, 9.30sample/s]  
Epoch 6/10 (Eval): 100%|██████████| 1  
71/71 [00:03<00:00, 22.07sample/s]  
Epoch 6/10, Training Loss: 0.6389124715181146, Validation Loss: 0.5916005961470685  
Accuracy: 0.6915254237288135, Precision: 0.7477606057022181, Recall: 0.6915254237288  
135, F1-score: 0.6721473597912232
```

```
Epoch 7/10 (Train): 100%|██████████| 1  
17/117 [00:12<00:00, 9.29sample/s]  
Epoch 7/10 (Eval): 100%|██████████|  
71/71 [00:03<00:00, 22.15sample/s]  
Epoch 7/10, Training Loss: 0.6213096827166468, Validation Loss: 0.5419219824048759  
Accuracy: 0.7440677966101695, Precision: 0.7457871456234635, Recall: 0.7440677966101  
695, F1-score: 0.7437252090563775  
Epoch 8/10 (Train): 100%|██████████| 1  
17/117 [00:12<00:00, 9.13sample/s]  
Epoch 8/10 (Eval): 100%|██████████|  
71/71 [00:03<00:00, 21.62sample/s]  
Epoch 8/10, Training Loss: 0.5948330076121565, Validation Loss: 0.5343031298979527  
Accuracy: 0.735593220338983, Precision: 0.7621284717276742, Recall: 0.73559322033898  
3, F1-score: 0.7282943636394359  
Epoch 9/10 (Train): 100%|██████████| 1  
17/117 [00:12<00:00, 9.57sample/s]  
Epoch 9/10 (Eval): 100%|██████████|  
71/71 [00:03<00:00, 21.96sample/s]  
Epoch 9/10, Training Loss: 0.5928882044357662, Validation Loss: 0.48889474326607874  
Accuracy: 0.7813559322033898, Precision: 0.7993832507391829, Recall: 0.7813559322033  
898, F1-score: 0.7777641657910266  
Epoch 10/10 (Train): 100%|██████████| 1  
17/117 [00:12<00:00, 9.53sample/s]  
Epoch 10/10 (Eval): 100%|██████████|  
71/71 [00:03<00:00, 21.93sample/s]  
Epoch 10/10, Training Loss: 0.5767833335175753, Validation Loss: 0.49717177635869064  
Accuracy: 0.7954802259887006, Precision: 0.7962771984006076, Recall: 0.7954802259887  
006, F1-score: 0.7952919995645314  
Тренировка завершена!  
Test: 100%|██████████|  
72/72 [00:03<00:00, 20.29sample/s]  
Test Accuracy: 0.7931995540691192  
Precision: 0.7941647524352724, Recall: 0.7931995540691192, F1-score: 0.7930893148697  
72  
Accuracy of cats : 81 %  
Accuracy of dogs : 76 %  
  
Class_name: cats  
Train_count: 900  
Test_count: 300  
Valid_count: 300  
Shutil images: 100%|██████████| 150  
0/1500 [00:00<00:00, 1796.51image/s]  
Class_name: dogs  
Train_count: 900  
Test_count: 300  
Valid_count: 300  
Shutil images: 100%|██████████| 150  
0/1500 [00:00<00:00, 1812.47image/s]
```

-----  
Выбранная модель: shufflenet\_v2\_x1\_5  
Пользовательское название модели: shufflenet\_v2\_x1\_5\_Exp1  
Выбранный оптимизатор: AdamW  
-----

```
Epoch 1/10 (Train): 100%|██████████| 1  
17/117 [00:12<00:00, 9.36sample/s]  
Epoch 1/10 (Eval): 100%|██████████| 1  
71/71 [00:03<00:00, 21.87sample/s]  
Epoch 1/10, Training Loss: 0.7356393866909947, Validation Loss: 0.6666557649939747  
Accuracy: 0.5926553672316384, Precision: 0.6280006437068899, Recall: 0.5926553672316  
384, F1-score: 0.560406445085357  
Epoch 2/10 (Train): 100%|██████████| 1  
17/117 [00:12<00:00, 9.33sample/s]  
Epoch 2/10 (Eval): 100%|██████████| 1  
71/71 [00:03<00:00, 22.23sample/s]  
Epoch 2/10, Training Loss: 0.6831434330276792, Validation Loss: 0.6780779424023493  
Accuracy: 0.5576271186440678, Precision: 0.6736246663042555, Recall: 0.5576271186440  
678, F1-score: 0.4657498621690776  
Epoch 3/10 (Train): 100%|██████████| 1  
17/117 [00:12<00:00, 9.52sample/s]  
Epoch 3/10 (Eval): 100%|██████████| 1  
71/71 [00:03<00:00, 22.26sample/s]  
Epoch 3/10, Training Loss: 0.6686605692032349, Validation Loss: 0.6105545281016894  
Accuracy: 0.7062146892655368, Precision: 0.717990126964868, Recall: 0.70621468926553  
68, F1-score: 0.7025736791176458  
Epoch 4/10 (Train): 100%|██████████| 1  
17/117 [00:12<00:00, 9.34sample/s]  
Epoch 4/10 (Eval): 100%|██████████| 1  
71/71 [00:03<00:00, 21.77sample/s]  
Epoch 4/10, Training Loss: 0.6470260085963156, Validation Loss: 0.5701783492235141  
Accuracy: 0.7265536723163842, Precision: 0.745375015762137, Recall: 0.72655367231638  
42, F1-score: 0.7208016026302069  
Epoch 5/10 (Train): 100%|██████████| 1  
17/117 [00:12<00:00, 9.27sample/s]  
Epoch 5/10 (Eval): 100%|██████████| 1  
71/71 [00:03<00:00, 21.84sample/s]  
Epoch 5/10, Training Loss: 0.6200504852758849, Validation Loss: 0.5658055388152936  
Accuracy: 0.6977401129943502, Precision: 0.7622856778301403, Recall: 0.6977401129943  
502, F1-score: 0.6771152026445969  
Epoch 6/10 (Train): 100%|██████████| 1  
17/117 [00:12<00:00, 9.25sample/s]  
Epoch 6/10 (Eval): 100%|██████████| 1  
71/71 [00:03<00:00, 21.56sample/s]  
Epoch 6/10, Training Loss: 0.6028583976628439, Validation Loss: 0.49982743428251836  
Accuracy: 0.7915254237288135, Precision: 0.7920305787706007, Recall: 0.7915254237288  
135, F1-score: 0.7913929584492337
```

```
Epoch 7/10 (Train): 100%|██████████| 1  
17/117 [00:12<00:00, 9.50sample/s]  
Epoch 7/10 (Eval): 100%|██████████|  
71/71 [00:03<00:00, 21.11sample/s]  
Epoch 7/10, Training Loss: 0.5762220183674647, Validation Loss: 0.514655059466591  
Accuracy: 0.7457627118644068, Precision: 0.8000889673951772, Recall: 0.7457627118644068, F1-score: 0.7331890198968312  
Epoch 8/10 (Train): 100%|██████████| 1  
17/117 [00:12<00:00, 9.25sample/s]  
Epoch 8/10 (Eval): 100%|██████████|  
71/71 [00:03<00:00, 21.85sample/s]  
Epoch 8/10, Training Loss: 0.573226921020345, Validation Loss: 0.4452359574494389  
Accuracy: 0.8028248587570621, Precision: 0.8029622967583845, Recall: 0.8028248587570621, F1-score: 0.8028195090744207  
Epoch 9/10 (Train): 100%|██████████| 1  
17/117 [00:12<00:00, 9.40sample/s]  
Epoch 9/10 (Eval): 100%|██████████|  
71/71 [00:03<00:00, 21.96sample/s]  
Epoch 9/10, Training Loss: 0.5618803850627256, Validation Loss: 0.4345661452261068  
Accuracy: 0.8225988700564971, Precision: 0.8233388457382343, Recall: 0.8225988700564971, F1-score: 0.8224592057290333  
Epoch 10/10 (Train): 100%|██████████| 1  
17/117 [00:12<00:00, 9.25sample/s]  
Epoch 10/10 (Eval): 100%|██████████|  
71/71 [00:03<00:00, 21.78sample/s]  
Epoch 10/10, Training Loss: 0.5547498313121554, Validation Loss: 0.41722507353893107  
Accuracy: 0.8440677966101695, Precision: 0.8443959865047657, Recall: 0.8440677966101695, F1-score: 0.8440496782938416  
Тренировка завершена!  
Test: 100%|██████████|  
72/72 [00:03<00:00, 19.32sample/s]  
Test Accuracy: 0.8361204013377926  
Precision: 0.8372668545272607, Recall: 0.8361204013377926, F1-score: 0.835933157688728  
Accuracy of cats : 80 %  
Accuracy of dogs : 86 %  
  
Class_name: cats  
Train_count: 900  
Test_count: 300  
Valid_count: 300  
Shutil images: 100%|██████████| 150  
0/1500 [00:00<00:00, 1888.96image/s]  
Class_name: dogs  
Train_count: 900  
Test_count: 300  
Valid_count: 300  
Shutil images: 100%|██████████| 150  
0/1500 [00:00<00:00, 1882.02image/s]
```

-----  
Выбранная модель: shufflenet\_v2\_x2\_0  
Пользовательское название модели: shufflenet\_v2\_x2\_0\_Exp1  
Выбранный оптимизатор: AdamW  
-----

```
Epoch 1/10 (Train): 100%|██████████| 1  
17/117 [00:12<00:00, 9.25sample/s]  
Epoch 1/10 (Eval): 100%|██████████| 1  
71/71 [00:03<00:00, 20.56sample/s]  
Epoch 1/10, Training Loss: 0.758783456824102, Validation Loss: 0.6735100175364542  
Accuracy: 0.5418079096045197, Precision: 0.6809046990764234, Recall: 0.5418079096045  
197, F1-score: 0.42919990608001696  
Epoch 2/10 (Train): 100%|██████████| 1  
17/117 [00:12<00:00, 9.31sample/s]  
Epoch 2/10 (Eval): 100%|██████████| 1  
71/71 [00:03<00:00, 21.19sample/s]  
Epoch 2/10, Training Loss: 0.6842029988765717, Validation Loss: 0.6152320503346664  
Accuracy: 0.6661016949152543, Precision: 0.6718994773121223, Recall: 0.6661016949152  
543, F1-score: 0.6636590534482113  
Epoch 3/10 (Train): 100%|██████████| 1  
17/117 [00:12<00:00, 9.26sample/s]  
Epoch 3/10 (Eval): 100%|██████████| 1  
71/71 [00:03<00:00, 19.60sample/s]  
Epoch 3/10, Training Loss: 0.6553797909072036, Validation Loss: 0.528676601200454  
Accuracy: 0.7412429378531074, Precision: 0.7445586921004161, Recall: 0.7412429378531  
074, F1-score: 0.7405143143389875  
Epoch 4/10 (Train): 100%|██████████| 1  
17/117 [00:12<00:00, 9.05sample/s]  
Epoch 4/10 (Eval): 100%|██████████| 1  
71/71 [00:03<00:00, 20.21sample/s]  
Epoch 4/10, Training Loss: 0.652051334453822, Validation Loss: 0.5982763621598314  
Accuracy: 0.6779661016949152, Precision: 0.7429207513212365, Recall: 0.6779661016949  
152, F1-score: 0.6539395680447103  
Epoch 5/10 (Train): 100%|██████████| 1  
17/117 [00:12<00:00, 9.05sample/s]  
Epoch 5/10 (Eval): 100%|██████████| 1  
71/71 [00:03<00:00, 19.83sample/s]  
Epoch 5/10, Training Loss: 0.6009729217898773, Validation Loss: 0.5223850745939266  
Accuracy: 0.7740112994350282, Precision: 0.7767211615000928, Recall: 0.7740112994350  
282, F1-score: 0.7733469026604011  
Epoch 6/10 (Train): 100%|██████████| 1  
17/117 [00:12<00:00, 9.38sample/s]  
Epoch 6/10 (Eval): 100%|██████████| 1  
71/71 [00:03<00:00, 20.59sample/s]  
Epoch 6/10, Training Loss: 0.6023657659887042, Validation Loss: 0.5150501210726587  
Accuracy: 0.7717514124293785, Precision: 0.7910780188830959, Recall: 0.7717514124293  
785, F1-score: 0.7676190351016625
```

```
Epoch 7/10 (Train): 100%|██████████| 1  
17/117 [00:12<00:00, 9.34sample/s]  
Epoch 7/10 (Eval): 100%|██████████|  
71/71 [00:03<00:00, 20.40sample/s]  
Epoch 7/10, Training Loss: 0.5938246755709462, Validation Loss: 0.492753332575499  
Accuracy: 0.8045197740112995, Precision: 0.8220547288080201, Recall: 0.8045197740112  
995, F1-score: 0.8016197334403016  
Epoch 8/10 (Train): 100%|██████████| 1  
17/117 [00:12<00:00, 9.10sample/s]  
Epoch 8/10 (Eval): 100%|██████████|  
71/71 [00:03<00:00, 20.70sample/s]  
Epoch 8/10, Training Loss: 0.5555540271884697, Validation Loss: 0.39781323058457024  
Accuracy: 0.8514124293785311, Precision: 0.854007796379621, Recall: 0.8514124293785  
11, F1-score: 0.8510865805899571  
Epoch 9/10 (Train): 100%|██████████| 1  
17/117 [00:12<00:00, 9.13sample/s]  
Epoch 9/10 (Eval): 100%|██████████|  
71/71 [00:03<00:00, 19.94sample/s]  
Epoch 9/10, Training Loss: 0.5429018462987041, Validation Loss: 0.3910178537085905  
Accuracy: 0.8310734463276837, Precision: 0.8311032175222899, Recall: 0.8310734463276  
837, F1-score: 0.8310753335492863  
Epoch 10/10 (Train): 100%|██████████| 1  
17/117 [00:13<00:00, 8.96sample/s]  
Epoch 10/10 (Eval): 100%|██████████|  
71/71 [00:03<00:00, 19.86sample/s]  
Epoch 10/10, Training Loss: 0.5243501398173647, Validation Loss: 0.40540436166996335  
Accuracy: 0.8146892655367232, Precision: 0.8228165989539279, Recall: 0.8146892655367  
232, F1-score: 0.813385909047933  
Тренировка завершена!  
Test: 100%|██████████|  
72/72 [00:03<00:00, 18.44sample/s]  
Test Accuracy: 0.8160535117056856  
Precision: 0.8216067160860111, Recall: 0.8160535117056856, F1-score: 0.8153750724477  
548  
Accuracy of cats : 87 %  
Accuracy of dogs : 75 %  
  
Class_name: cats  
Train_count: 900  
Test_count: 300  
Valid_count: 300  
Shutil images: 100%|██████████| 150  
0/1500 [00:00<00:00, 1842.50image/s]  
Class_name: dogs  
Train_count: 900  
Test_count: 300  
Valid_count: 300  
Shutil images: 100%|██████████| 150  
0/1500 [00:00<00:00, 1752.15image/s]
```

-----  
Выбранная модель: swin\_b  
Пользовательское название модели: swin\_b\_Exp1  
Выбранный оптимизатор: SGD  
-----

```
Epoch 1/10 (Train): 100%|██████████| 1  
17/117 [00:20<00:00, 5.85sample/s]  
Epoch 1/10 (Eval): 100%|██████████| 1  
71/71 [00:05<00:00, 13.93sample/s]  
Epoch 1/10, Training Loss: 0.7082324550321774, Validation Loss: 0.6743407051610408  
Accuracy: 0.5796610169491525, Precision: 0.6331444200596081, Recall: 0.5796610169491525, F1-score: 0.5301432359456585  
Epoch 2/10 (Train): 100%|██████████| 1  
17/117 [00:20<00:00, 5.83sample/s]  
Epoch 2/10 (Eval): 100%|██████████| 1  
71/71 [00:05<00:00, 13.60sample/s]  
Epoch 2/10, Training Loss: 0.6932057780791342, Validation Loss: 0.6548803510975703  
Accuracy: 0.6011299435028249, Precision: 0.6024097276528986, Recall: 0.6011299435028249, F1-score: 0.600276877574562  
Epoch 3/10 (Train): 100%|██████████| 1  
17/117 [00:20<00:00, 5.81sample/s]  
Epoch 3/10 (Eval): 100%|██████████| 1  
71/71 [00:05<00:00, 13.85sample/s]  
Epoch 3/10, Training Loss: 0.6878709767149114, Validation Loss: 0.6772510812612577  
Accuracy: 0.5790960451977402, Precision: 0.648618226545397, Recall: 0.5790960451977402, F1-score: 0.5207238337792485  
Epoch 4/10 (Train): 100%|██████████| 1  
17/117 [00:20<00:00, 5.74sample/s]  
Epoch 4/10 (Eval): 100%|██████████| 1  
71/71 [00:05<00:00, 14.09sample/s]  
Epoch 4/10, Training Loss: 0.6862644100532375, Validation Loss: 0.6486217881326621  
Accuracy: 0.611864406779661, Precision: 0.612998391314738, Recall: 0.611864406779661, F1-score: 0.6112077150294674  
Epoch 5/10 (Train): 100%|██████████| 1  
17/117 [00:20<00:00, 5.74sample/s]  
Epoch 5/10 (Eval): 100%|██████████| 1  
71/71 [00:04<00:00, 14.29sample/s]  
Epoch 5/10, Training Loss: 0.6828860277954727, Validation Loss: 0.6461840807381323  
Accuracy: 0.615819209039548, Precision: 0.67745827194417, Recall: 0.615819209039548, F1-score: 0.5775845559721834  
Epoch 6/10 (Train): 100%|██████████| 1  
17/117 [00:20<00:00, 5.69sample/s]  
Epoch 6/10 (Eval): 100%|██████████| 1  
71/71 [00:05<00:00, 13.91sample/s]  
Epoch 6/10, Training Loss: 0.6766534215624485, Validation Loss: 0.6691126920240748  
Accuracy: 0.6022598870056497, Precision: 0.667057881388026, Recall: 0.6022598870056497, F1-score: 0.5575633840271097
```

```
Epoch 7/10 (Train): 100%|██████████| 1  
17/117 [00:20<00:00, 5.68sample/s]  
Epoch 7/10 (Eval): 100%|██████████|  
71/71 [00:04<00:00, 14.36sample/s]  
Epoch 7/10, Training Loss: 0.6735744708159592, Validation Loss: 0.6491217481046073  
Accuracy: 0.6129943502824858, Precision: 0.6871905011095928, Recall: 0.6129943502824858, F1-score: 0.5686367187165016  
Epoch 8/10 (Train): 100%|██████████| 1  
17/117 [00:20<00:00, 5.66sample/s]  
Epoch 8/10 (Eval): 100%|██████████|  
71/71 [00:05<00:00, 13.85sample/s]  
Epoch 8/10, Training Loss: 0.6681053111453511, Validation Loss: 0.628127262669768  
Accuracy: 0.6378531073446327, Precision: 0.6685370734280169, Recall: 0.6378531073446327, F1-score: 0.6194487764085447  
Epoch 9/10 (Train): 100%|██████████| 1  
17/117 [00:20<00:00, 5.59sample/s]  
Epoch 9/10 (Eval): 100%|██████████|  
71/71 [00:04<00:00, 14.38sample/s]  
Epoch 9/10, Training Loss: 0.6743365291089861, Validation Loss: 0.6098585091741745  
Accuracy: 0.6576271186440678, Precision: 0.6582877289180863, Recall: 0.6576271186440678, F1-score: 0.6570945840548046  
Epoch 10/10 (Train): 100%|██████████| 1  
17/117 [00:20<00:00, 5.63sample/s]  
Epoch 10/10 (Eval): 100%|██████████|  
71/71 [00:04<00:00, 14.40sample/s]  
Epoch 10/10, Training Loss: 0.6639668979082637, Validation Loss: 0.6183090314353253  
Accuracy: 0.6531073446327683, Precision: 0.6721842937101001, Recall: 0.6531073446327683, F1-score: 0.6424110660787331  
Тренировка завершена!  
Test: 100%|██████████|  
72/72 [00:05<00:00, 13.76sample/s]  
Test Accuracy: 0.6426978818283167  
Precision: 0.6628796592709402, Recall: 0.6426978818283167, F1-score: 0.6322968598666706  
Accuracy of cats : 81 %  
Accuracy of dogs : 47 %  
  
Class_name: cats  
Train_count: 900  
Test_count: 300  
Valid_count: 300  
Shutil images: 100%|██████████| 150  
0/1500 [00:00<00:00, 1766.33image/s]  
Class_name: dogs  
Train_count: 900  
Test_count: 300  
Valid_count: 300  
Shutil images: 100%|██████████| 150  
0/1500 [00:00<00:00, 1801.57image/s]
```

-----  
Выбранная модель: swin\_s  
Пользовательское название модели: swin\_s\_Exp1  
Выбранный оптимизатор: SGD  
-----

```
Epoch 1/10 (Train): 100%|██████████| 1  
17/117 [00:17<00:00, 6.83sample/s]  
Epoch 1/10 (Eval): 100%|██████████| 1  
71/71 [00:04<00:00, 16.86sample/s]  
Epoch 1/10, Training Loss: 0.7051025382699503, Validation Loss: 0.6726483886188033  
Accuracy: 0.5796610169491525, Precision: 0.5897194088579734, Recall: 0.5796610169491525, F1-score: 0.5658098299462662  
Epoch 2/10 (Train): 100%|██████████| 1  
17/117 [00:17<00:00, 6.85sample/s]  
Epoch 2/10 (Eval): 100%|██████████| 1  
71/71 [00:04<00:00, 16.59sample/s]  
Epoch 2/10, Training Loss: 0.6859316518243002, Validation Loss: 0.6827574355454095  
Accuracy: 0.5774011299435028, Precision: 0.6607271927765795, Recall: 0.5774011299435028, F1-score: 0.511810123057139  
Epoch 3/10 (Train): 100%|██████████| 1  
17/117 [00:17<00:00, 6.76sample/s]  
Epoch 3/10 (Eval): 100%|██████████| 1  
71/71 [00:04<00:00, 16.60sample/s]  
Epoch 3/10, Training Loss: 0.6806286748056954, Validation Loss: 0.665865796265629  
Accuracy: 0.5932203389830508, Precision: 0.5964512830649117, Recall: 0.5932203389830508, F1-score: 0.590516187287195  
Epoch 4/10 (Train): 100%|██████████| 1  
17/117 [00:16<00:00, 6.91sample/s]  
Epoch 4/10 (Eval): 100%|██████████| 1  
71/71 [00:04<00:00, 16.53sample/s]  
Epoch 4/10, Training Loss: 0.6733987670266686, Validation Loss: 0.6361947094990035  
Accuracy: 0.6367231638418079, Precision: 0.6393297441010303, Recall: 0.6367231638418079, F1-score: 0.634600580467636  
Epoch 5/10 (Train): 100%|██████████| 1  
17/117 [00:17<00:00, 6.85sample/s]  
Epoch 5/10 (Eval): 100%|██████████| 1  
71/71 [00:04<00:00, 16.48sample/s]  
Epoch 5/10, Training Loss: 0.6689044348052955, Validation Loss: 0.6403966067874499  
Accuracy: 0.631638418079096, Precision: 0.6331364032319737, Recall: 0.631638418079096, F1-score: 0.6308888385186191  
Epoch 6/10 (Train): 100%|██████████| 1  
17/117 [00:17<00:00, 6.82sample/s]  
Epoch 6/10 (Eval): 100%|██████████| 1  
71/71 [00:04<00:00, 15.64sample/s]  
Epoch 6/10, Training Loss: 0.6660147429207076, Validation Loss: 0.6352433514291957  
Accuracy: 0.632768361581921, Precision: 0.6350801210594538, Recall: 0.632768361581921, F1-score: 0.6315494618381828
```

```
Epoch 7/10 (Train): 100%|██████████| 1  
17/117 [00:17<00:00, 6.83sample/s]  
Epoch 7/10 (Eval): 100%|██████████|  
71/71 [00:04<00:00, 16.71sample/s]  
Epoch 7/10, Training Loss: 0.6654429490881639, Validation Loss: 0.6209829522054747  
Accuracy: 0.6502824858757063, Precision: 0.6516351150100529, Recall: 0.6502824858757063, F1-score: 0.6497230362178824  
Epoch 8/10 (Train): 100%|██████████| 1  
17/117 [00:17<00:00, 6.68sample/s]  
Epoch 8/10 (Eval): 100%|██████████|  
71/71 [00:04<00:00, 16.60sample/s]  
Epoch 8/10, Training Loss: 0.6645038485567891, Validation Loss: 0.612829535778633  
Accuracy: 0.6689265536723163, Precision: 0.6732821997853642, Recall: 0.6689265536723163, F1-score: 0.666469230786682  
Epoch 9/10 (Train): 100%|██████████| 1  
17/117 [00:17<00:00, 6.81sample/s]  
Epoch 9/10 (Eval): 100%|██████████|  
71/71 [00:04<00:00, 16.45sample/s]  
Epoch 9/10, Training Loss: 0.6536074251733143, Validation Loss: 0.6392688193900437  
Accuracy: 0.6412429378531074, Precision: 0.6608505435318899, Recall: 0.6412429378531074, F1-score: 0.6290307351629821  
Epoch 10/10 (Train): 100%|██████████| 1  
17/117 [00:17<00:00, 6.73sample/s]  
Epoch 10/10 (Eval): 100%|██████████|  
71/71 [00:04<00:00, 16.47sample/s]  
Epoch 10/10, Training Loss: 0.6501784782813297, Validation Loss: 0.6055785303061965  
Accuracy: 0.6661016949152543, Precision: 0.6785589470526473, Recall: 0.6661016949152543, F1-score: 0.6595769768630548  
Тренировка завершена!  
Test: 100%|██████████|  
72/72 [00:04<00:00, 15.82sample/s]  
Test Accuracy: 0.6627647714604237  
Precision: 0.678322392990003, Recall: 0.6627647714604237, F1-score: 0.6559894463279509  
Accuracy of cats : 80 %  
Accuracy of dogs : 52 %  
  
Class_name: cats  
Train_count: 900  
Test_count: 300  
Valid_count: 300  
Shutil images: 100%|██████████| 150  
0/1500 [00:00<00:00, 1775.65image/s]  
Class_name: dogs  
Train_count: 900  
Test_count: 300  
Valid_count: 300  
Shutil images: 100%|██████████| 150  
0/1500 [00:00<00:00, 1764.88image/s]
```

-----  
Выбранная модель: swin\_t  
Пользовательское название модели: swin\_t\_Exp1  
Выбранный оптимизатор: SGD  
-----

```
Epoch 1/10 (Train): 100%|██████████| 1  
17/117 [00:11<00:00, 9.90sample/s]  
Epoch 1/10 (Eval): 100%|██████████| 1  
71/71 [00:03<00:00, 19.96sample/s]  
Epoch 1/10, Training Loss: 0.6986524286418847, Validation Loss: 0.6904120325705426  
Accuracy: 0.5813559322033899, Precision: 0.5813932100554376, Recall: 0.5813559322033  
899, F1-score: 0.5813595401775679  
Epoch 2/10 (Train): 100%|██████████| 1  
17/117 [00:11<00:00, 9.91sample/s]  
Epoch 2/10 (Eval): 100%|██████████| 1  
71/71 [00:03<00:00, 19.61sample/s]  
Epoch 2/10, Training Loss: 0.6904870535593641, Validation Loss: 0.6651782175410266  
Accuracy: 0.5887005649717514, Precision: 0.6198519848646348, Recall: 0.5887005649717  
514, F1-score: 0.5580140448009632  
Epoch 3/10 (Train): 100%|██████████| 1  
17/117 [00:11<00:00, 9.92sample/s]  
Epoch 3/10 (Eval): 100%|██████████| 1  
71/71 [00:03<00:00, 20.03sample/s]  
Epoch 3/10, Training Loss: 0.6836771974423064, Validation Loss: 0.6509075525116785  
Accuracy: 0.6135593220338983, Precision: 0.6136596038866816, Recall: 0.6135593220338  
983, F1-score: 0.6135460001682763  
Epoch 4/10 (Train): 100%|██████████| 1  
17/117 [00:12<00:00, 9.70sample/s]  
Epoch 4/10 (Eval): 100%|██████████| 1  
71/71 [00:03<00:00, 19.50sample/s]  
Epoch 4/10, Training Loss: 0.6743515557504174, Validation Loss: 0.6498004011178421  
Accuracy: 0.6169491525423729, Precision: 0.617634893466653, Recall: 0.61694915254237  
29, F1-score: 0.6160886120440522  
Epoch 5/10 (Train): 100%|██████████| 1  
17/117 [00:12<00:00, 9.52sample/s]  
Epoch 5/10 (Eval): 100%|██████████| 1  
71/71 [00:03<00:00, 19.77sample/s]  
Epoch 5/10, Training Loss: 0.6711160173515819, Validation Loss: 0.6417512525778032  
Accuracy: 0.6389830508474577, Precision: 0.6606511048526204, Recall: 0.6389830508474  
577, F1-score: 0.6253897091030604  
Epoch 6/10 (Train): 100%|██████████| 1  
17/117 [00:11<00:00, 9.75sample/s]  
Epoch 6/10 (Eval): 100%|██████████| 1  
71/71 [00:03<00:00, 19.46sample/s]  
Epoch 6/10, Training Loss: 0.6673287836511793, Validation Loss: 0.633549698160193  
Accuracy: 0.6480225988700565, Precision: 0.6481846514978041, Recall: 0.6480225988700  
565, F1-score: 0.6479941735382709
```

```
Epoch 7/10 (Train): 100%|██████████| 1  
17/117 [00:11<00:00, 9.79sample/s]  
Epoch 7/10 (Eval): 100%|██████████|  
71/71 [00:03<00:00, 19.61sample/s]  
Epoch 7/10, Training Loss: 0.6696185465337807, Validation Loss: 0.6282235875641559  
Accuracy: 0.6621468926553672, Precision: 0.6726652343657077, Recall: 0.6621468926553  
672, F1-score: 0.6563428358990824  
Epoch 8/10 (Train): 100%|██████████| 1  
17/117 [00:12<00:00, 9.69sample/s]  
Epoch 8/10 (Eval): 100%|██████████|  
71/71 [00:03<00:00, 19.65sample/s]  
Epoch 8/10, Training Loss: 0.6635786108647086, Validation Loss: 0.6220134542150012  
Accuracy: 0.6610169491525424, Precision: 0.6718706385630546, Recall: 0.6610169491525  
424, F1-score: 0.6549852928775861  
Epoch 9/10 (Train): 100%|██████████| 1  
17/117 [00:12<00:00, 9.71sample/s]  
Epoch 9/10 (Eval): 100%|██████████|  
71/71 [00:03<00:00, 19.57sample/s]  
Epoch 9/10, Training Loss: 0.6535059214046837, Validation Loss: 0.6204736970238767  
Accuracy: 0.6706214689265537, Precision: 0.6756298390884201, Recall: 0.6706214689265  
537, F1-score: 0.6678755967615803  
Epoch 10/10 (Train): 100%|██████████| 1  
17/117 [00:12<00:00, 9.72sample/s]  
Epoch 10/10 (Eval): 100%|██████████|  
71/71 [00:03<00:00, 19.84sample/s]  
Epoch 10/10, Training Loss: 0.6574814589853725, Validation Loss: 0.6115025280222381  
Accuracy: 0.6785310734463277, Precision: 0.6798397830735029, Recall: 0.6785310734463  
277, F1-score: 0.6777559675333493  
Тренировка завершена!  
Test: 100%|██████████|  
72/72 [00:04<00:00, 17.58sample/s]  
Test Accuracy: 0.6672240802675585  
Precision: 0.6695723672292012, Recall: 0.6672240802675585, F1-score: 0.6663520387341  
47  
Accuracy of cats : 72 %  
Accuracy of dogs : 61 %  
  
Class_name: cats  
Train_count: 900  
Test_count: 300  
Valid_count: 300  
Shutil images: 100%|██████████| 150  
0/1500 [00:00<00:00, 1808.39image/s]  
Class_name: dogs  
Train_count: 900  
Test_count: 300  
Valid_count: 300  
Shutil images: 100%|██████████| 150  
0/1500 [00:00<00:00, 1814.39image/s]
```

-----  
Выбранная модель: vgg11  
Пользовательское название модели: vgg11\_Exp1  
Выбранный оптимизатор: SGD  
-----

```
Epoch 1/10 (Train): 100%|██████████| 1  
17/117 [00:08<00:00, 13.10sample/s]  
Epoch 1/10 (Eval): 100%|██████████| 1  
71/71 [00:02<00:00, 24.18sample/s]  
Epoch 1/10, Training Loss: 0.6974715743676042, Validation Loss: 0.6928637297140003  
Accuracy: 0.4966101694915254, Precision: 0.2466216604424016, Recall: 0.4966101694915  
254, F1-score: 0.329573679866403  
Epoch 2/10 (Train): 100%|██████████| 1  
17/117 [00:08<00:00, 13.20sample/s]  
Epoch 2/10 (Eval): 100%|██████████| 1  
71/71 [00:02<00:00, 24.11sample/s]  
Epoch 2/10, Training Loss: 0.6956881584575357, Validation Loss: 0.692545611811223  
Accuracy: 0.4966101694915254, Precision: 0.2466216604424016, Recall: 0.4966101694915  
254, F1-score: 0.329573679866403  
Epoch 3/10 (Train): 100%|██████████| 1  
17/117 [00:08<00:00, 13.17sample/s]  
Epoch 3/10 (Eval): 100%|██████████| 1  
71/71 [00:02<00:00, 23.95sample/s]  
Epoch 3/10, Training Loss: 0.6988055221098102, Validation Loss: 0.6899539244040257  
Accuracy: 0.5644067796610169, Precision: 0.6296980521384089, Recall: 0.5644067796610  
169, F1-score: 0.4984737987793909  
Epoch 4/10 (Train): 100%|██████████| 1  
17/117 [00:08<00:00, 13.34sample/s]  
Epoch 4/10 (Eval): 100%|██████████| 1  
71/71 [00:02<00:00, 24.19sample/s]  
Epoch 4/10, Training Loss: 0.6940036694263252, Validation Loss: 0.6886688418644297  
Accuracy: 0.5745762711864407, Precision: 0.6117326115299586, Recall: 0.5745762711864  
407, F1-score: 0.5385596528136122  
Epoch 5/10 (Train): 100%|██████████| 1  
17/117 [00:08<00:00, 13.23sample/s]  
Epoch 5/10 (Eval): 100%|██████████| 1  
71/71 [00:02<00:00, 24.02sample/s]  
Epoch 5/10, Training Loss: 0.6922063602618439, Validation Loss: 0.6878532167881896  
Accuracy: 0.6271186440677966, Precision: 0.644495916283024, Recall: 0.62711864406779  
66, F1-score: 0.614507356006034  
Epoch 6/10 (Train): 100%|██████████| 1  
17/117 [00:08<00:00, 13.40sample/s]  
Epoch 6/10 (Eval): 100%|██████████| 1  
71/71 [00:02<00:00, 24.15sample/s]  
Epoch 6/10, Training Loss: 0.6906944531500544, Validation Loss: 0.6867135823783228  
Accuracy: 0.5615819209039548, Precision: 0.6303909393930419, Recall: 0.5615819209039  
548, F1-score: 0.4981626278551705
```

```
Epoch 7/10 (Train): 100%|██████████| 1  
17/117 [00:09<00:00, 12.53sample/s]  
Epoch 7/10 (Eval): 100%|██████████| 1  
71/71 [00:02<00:00, 23.88sample/s]  
Epoch 7/10, Training Loss: 0.6878491730171985, Validation Loss: 0.6852975413624176  
Accuracy: 0.6282485875706215, Precision: 0.6488550791631283, Recall: 0.6282485875706  
215, F1-score: 0.6138159536364033  
Epoch 8/10 (Train): 100%|██████████| 1  
17/117 [00:09<00:00, 12.74sample/s]  
Epoch 8/10 (Eval): 100%|██████████| 1  
71/71 [00:02<00:00, 24.02sample/s]  
Epoch 8/10, Training Loss: 0.6917141546240565, Validation Loss: 0.6840846336494057  
Accuracy: 0.63954802259887, Precision: 0.6513611250092517, Recall: 0.63954802259887,  
F1-score: 0.6315949095509109  
Epoch 9/10 (Train): 100%|██████████| 1  
17/117 [00:08<00:00, 13.22sample/s]  
Epoch 9/10 (Eval): 100%|██████████| 1  
71/71 [00:02<00:00, 24.10sample/s]  
Epoch 9/10, Training Loss: 0.6877581961069963, Validation Loss: 0.6826010144363015  
Accuracy: 0.6045197740112994, Precision: 0.6137226144937177, Recall: 0.6045197740112  
994, F1-score: 0.5973728813559321  
Epoch 10/10 (Train): 100%|██████████| 1  
17/117 [00:08<00:00, 13.09sample/s]  
Epoch 10/10 (Eval): 100%|██████████| 1  
71/71 [00:02<00:00, 23.87sample/s]  
Epoch 10/10, Training Loss: 0.6880038893941823, Validation Loss: 0.6814511287010322  
Accuracy: 0.5977401129943503, Precision: 0.6180501259912001, Recall: 0.5977401129943  
503, F1-score: 0.5812037422703534  
Тренировка завершена!  
Test: 100%|██████████| 1  
72/72 [00:04<00:00, 17.96sample/s]  
Test Accuracy: 0.6025641025641025  
Precision: 0.6215496612659734, Recall: 0.6025641025641025, F1-score: 0.5846834650348  
38  
Accuracy of cats : 39 %  
Accuracy of dogs : 80 %  
  
Class_name: cats  
Train_count: 900  
Test_count: 300  
Valid_count: 300  
Shutil images: 100%|██████████| 150  
0/1500 [00:00<00:00, 1803.25image/s]  
Class_name: dogs  
Train_count: 900  
Test_count: 300  
Valid_count: 300  
Shutil images: 100%|██████████| 150  
0/1500 [00:00<00:00, 1696.85image/s]
```

-----  
Выбранная модель: vgg11\_bn  
Пользовательское название модели: vgg11\_bn\_Exp1  
Выбранный оптимизатор: SGD  
-----

```
Epoch 1/10 (Train): 100%|██████████| 1  
17/117 [00:09<00:00, 12.91sample/s]  
Epoch 1/10 (Eval): 100%|██████████| 1  
71/71 [00:02<00:00, 23.83sample/s]  
Epoch 1/10, Training Loss: 0.7699512159522058, Validation Loss: 0.666999190540637  
Accuracy: 0.6282485875706215, Precision: 0.6282745856955068, Recall: 0.6282485875706  
215, F1-score: 0.6281460224888489  
Epoch 2/10 (Train): 100%|██████████| 1  
17/117 [00:08<00:00, 13.07sample/s]  
Epoch 2/10 (Eval): 100%|██████████| 1  
71/71 [00:02<00:00, 24.02sample/s]  
Epoch 2/10, Training Loss: 0.7426811282646174, Validation Loss: 0.6574777516268068  
Accuracy: 0.656497175141243, Precision: 0.6565982290082213, Recall: 0.65649717514124  
3, F1-score: 0.6563589462175162  
Epoch 3/10 (Train): 100%|██████████| 1  
17/117 [00:09<00:00, 12.94sample/s]  
Epoch 3/10 (Eval): 100%|██████████| 1  
71/71 [00:02<00:00, 24.04sample/s]  
Epoch 3/10, Training Loss: 0.7331912647256139, Validation Loss: 0.6521631776444656  
Accuracy: 0.6129943502824858, Precision: 0.6787258118375691, Recall: 0.6129943502824  
858, F1-score: 0.572040011973978  
Epoch 4/10 (Train): 100%|██████████| 1  
17/117 [00:09<00:00, 12.95sample/s]  
Epoch 4/10 (Eval): 100%|██████████| 1  
71/71 [00:02<00:00, 23.97sample/s]  
Epoch 4/10, Training Loss: 0.705426822037955, Validation Loss: 0.6393757587098806  
Accuracy: 0.6531073446327683, Precision: 0.6693895858263775, Recall: 0.6531073446327  
683, F1-score: 0.6438011336867023  
Epoch 5/10 (Train): 100%|██████████| 1  
17/117 [00:08<00:00, 13.08sample/s]  
Epoch 5/10 (Eval): 100%|██████████| 1  
71/71 [00:02<00:00, 24.00sample/s]  
Epoch 5/10, Training Loss: 0.6938054173102193, Validation Loss: 0.6300951038713509  
Accuracy: 0.6480225988700565, Precision: 0.6876331735817794, Recall: 0.6480225988700  
565, F1-score: 0.6273073220042227  
Epoch 6/10 (Train): 100%|██████████| 1  
17/117 [00:09<00:00, 12.97sample/s]  
Epoch 6/10 (Eval): 100%|██████████| 1  
71/71 [00:02<00:00, 23.91sample/s]  
Epoch 6/10, Training Loss: 0.6776898545994997, Validation Loss: 0.6392133269606337  
Accuracy: 0.6028248587570622, Precision: 0.6926959104048526, Recall: 0.6028248587570  
622, F1-score: 0.5523594277278094
```

```
Epoch 7/10 (Train): 100%|██████████| 1  
17/117 [00:09<00:00, 12.98sample/s]  
Epoch 7/10 (Eval): 100%|██████████| 1  
71/71 [00:02<00:00, 23.95sample/s]  
Epoch 7/10, Training Loss: 0.6623826411548259, Validation Loss: 0.6106258221602036  
Accuracy: 0.6870056497175141, Precision: 0.6926306347299002, Recall: 0.6870056497175  
141, F1-score: 0.6843635202546641  
Epoch 8/10 (Train): 100%|██████████| 1  
17/117 [00:09<00:00, 12.96sample/s]  
Epoch 8/10 (Eval): 100%|██████████| 1  
71/71 [00:02<00:00, 23.91sample/s]  
Epoch 8/10, Training Loss: 0.6796129532796704, Validation Loss: 0.6051134872907973  
Accuracy: 0.6858757062146893, Precision: 0.6918881744652499, Recall: 0.6858757062146  
893, F1-score: 0.6837286066830824  
Epoch 9/10 (Train): 100%|██████████| 1  
17/117 [00:09<00:00, 12.88sample/s]  
Epoch 9/10 (Eval): 100%|██████████| 1  
71/71 [00:02<00:00, 23.87sample/s]  
Epoch 9/10, Training Loss: 0.6526981399249671, Validation Loss: 0.6017081931991092  
Accuracy: 0.6717514124293785, Precision: 0.6858559715456175, Recall: 0.6717514124293  
785, F1-score: 0.6659720140312405  
Epoch 10/10 (Train): 100%|██████████| 1  
17/117 [00:08<00:00, 13.03sample/s]  
Epoch 10/10 (Eval): 100%|██████████| 1  
71/71 [00:02<00:00, 24.10sample/s]  
Epoch 10/10, Training Loss: 0.6531018296217085, Validation Loss: 0.5844059797835215  
Accuracy: 0.6926553672316385, Precision: 0.7063562414898701, Recall: 0.6926553672316  
385, F1-score: 0.6879288808694934  
Тренировка завершена!  
Test: 100%|██████████| 1  
72/72 [00:03<00:00, 18.69sample/s]  
Test Accuracy: 0.6995540691192865  
Precision: 0.7123796082656824, Recall: 0.6995540691192865, F1-score: 0.6944433857697  
594  
Accuracy of cats : 57 %  
Accuracy of dogs : 82 %  
  
Class_name: cats  
Train_count: 900  
Test_count: 300  
Valid_count: 300  
Shutil images: 100%|██████████| 150  
0/1500 [00:00<00:00, 1847.88image/s]  
Class_name: dogs  
Train_count: 900  
Test_count: 300  
Valid_count: 300  
Shutil images: 100%|██████████| 150  
0/1500 [00:00<00:00, 1849.30image/s]
```

-----  
Выбранная модель: vgg13  
Пользовательское название модели: vgg13\_Exp1  
Выбранный оптимизатор: SGD  
-----

```
Epoch 1/10 (Train): 100%|██████████| 1  
17/117 [00:09<00:00, 11.86sample/s]  
Epoch 1/10 (Eval): 100%|██████████| 1  
71/71 [00:03<00:00, 22.84sample/s]  
Epoch 1/10, Training Loss: 0.6953814092198817, Validation Loss: 0.6922314985323761  
Accuracy: 0.5514124293785311, Precision: 0.5777461825828752, Recall: 0.5514124293785  
311, F1-score: 0.5136008254880344  
Epoch 2/10 (Train): 100%|██████████| 1  
17/117 [00:09<00:00, 12.12sample/s]  
Epoch 2/10 (Eval): 100%|██████████| 1  
71/71 [00:03<00:00, 22.74sample/s]  
Epoch 2/10, Training Loss: 0.6916310270205192, Validation Loss: 0.6916477392285557  
Accuracy: 0.5084745762711864, Precision: 0.6970448379474314, Recall: 0.5084745762711  
864, F1-score: 0.35815208835735357  
Epoch 3/10 (Train): 100%|██████████| 1  
17/117 [00:09<00:00, 12.05sample/s]  
Epoch 3/10 (Eval): 100%|██████████| 1  
71/71 [00:03<00:00, 22.75sample/s]  
Epoch 3/10, Training Loss: 0.6910642696987529, Validation Loss: 0.6914247530328352  
Accuracy: 0.4977401129943503, Precision: 0.7502904747296573, Recall: 0.4977401129943  
503, F1-score: 0.33207752229346776  
Epoch 4/10 (Train): 100%|██████████| 1  
17/117 [00:09<00:00, 12.08sample/s]  
Epoch 4/10 (Eval): 100%|██████████| 1  
71/71 [00:03<00:00, 22.75sample/s]  
Epoch 4/10, Training Loss: 0.6918315559400934, Validation Loss: 0.6910462007347473  
Accuracy: 0.4977401129943503, Precision: 0.7502904747296573, Recall: 0.4977401129943  
503, F1-score: 0.33207752229346776  
Epoch 5/10 (Train): 100%|██████████| 1  
17/117 [00:09<00:00, 12.02sample/s]  
Epoch 5/10 (Eval): 100%|██████████| 1  
71/71 [00:03<00:00, 22.86sample/s]  
Epoch 5/10, Training Loss: 0.6920346082523312, Validation Loss: 0.6899529116301887  
Accuracy: 0.507909604519774, Precision: 0.7108834721494165, Recall: 0.50790960451977  
4, F1-score: 0.35603690972360047  
Epoch 6/10 (Train): 100%|██████████| 1  
17/117 [00:09<00:00, 12.05sample/s]  
Epoch 6/10 (Eval): 100%|██████████| 1  
71/71 [00:03<00:00, 22.86sample/s]  
Epoch 6/10, Training Loss: 0.6905681090537942, Validation Loss: 0.6891249758375566  
Accuracy: 0.5293785310734463, Precision: 0.6528225921039278, Recall: 0.5293785310734  
463, F1-score: 0.414578452248532
```

```
Epoch 7/10 (Train): 100%|██████████| 1  
17/117 [00:09<00:00, 11.99sample/s]  
Epoch 7/10 (Eval): 100%|██████████| 1  
71/71 [00:03<00:00, 22.66sample/s]  
Epoch 7/10, Training Loss: 0.6894937705062202, Validation Loss: 0.6880514825468009  
Accuracy: 0.6288135593220339, Precision: 0.6313541611366611, Recall: 0.6288135593220  
339, F1-score: 0.6274053935265234  
Epoch 8/10 (Train): 100%|██████████| 1  
17/117 [00:09<00:00, 12.04sample/s]  
Epoch 8/10 (Eval): 100%|██████████| 1  
71/71 [00:03<00:00, 22.79sample/s]  
Epoch 8/10, Training Loss: 0.6894305689723791, Validation Loss: 0.687279936957494  
Accuracy: 0.6050847457627119, Precision: 0.6206553566417274, Recall: 0.6050847457627  
119, F1-score: 0.5931812200429858  
Epoch 9/10 (Train): 100%|██████████| 1  
17/117 [00:09<00:00, 12.06sample/s]  
Epoch 9/10 (Eval): 100%|██████████| 1  
71/71 [00:03<00:00, 22.77sample/s]  
Epoch 9/10, Training Loss: 0.688627207499812, Validation Loss: 0.6866985896212906  
Accuracy: 0.5644067796610169, Precision: 0.6444095352882048, Recall: 0.5644067796610  
169, F1-score: 0.4974243078204643  
Epoch 10/10 (Train): 100%|██████████| 1  
17/117 [00:09<00:00, 11.98sample/s]  
Epoch 10/10 (Eval): 100%|██████████| 1  
71/71 [00:03<00:00, 22.77sample/s]  
Epoch 10/10, Training Loss: 0.6888145902044075, Validation Loss: 0.6856464607230688  
Accuracy: 0.6429378531073446, Precision: 0.6430044416515245, Recall: 0.6429378531073  
446, F1-score: 0.6428101395045216  
Тренировка завершена!  
Test: 100%|██████████| 1  
72/72 [00:04<00:00, 17.91sample/s]  
Test Accuracy: 0.6538461538461539  
Precision: 0.6540669632664374, Recall: 0.6538461538461539, F1-score: 0.6538084006081  
533  
Accuracy of cats : 66 %  
Accuracy of dogs : 64 %  
  
Class_name: cats  
Train_count: 900  
Test_count: 300  
Valid_count: 300  
Shutil images: 100%|██████████| 150  
0/1500 [00:00<00:00, 1816.20image/s]  
Class_name: dogs  
Train_count: 900  
Test_count: 300  
Valid_count: 300  
Shutil images: 100%|██████████| 150  
0/1500 [00:00<00:00, 1823.16image/s]
```

-----  
Выбранная модель: vgg13\_bn  
Пользовательское название модели: vgg13\_bn\_Exp1  
Выбранный оптимизатор: SGD  
-----

```
Epoch 1/10 (Train): 100%|██████████| 1  
17/117 [00:10<00:00, 11.46sample/s]  
Epoch 1/10 (Eval): 100%|██████████| 1  
71/71 [00:03<00:00, 22.54sample/s]  
Epoch 1/10, Training Loss: 0.7707287609740592, Validation Loss: 0.6709362739897043  
Accuracy: 0.5706214689265536, Precision: 0.6461845688215478, Recall: 0.5706214689265  
536, F1-score: 0.5039781998976278  
Epoch 2/10 (Train): 100%|██████████| 1  
17/117 [00:10<00:00, 11.65sample/s]  
Epoch 2/10 (Eval): 100%|██████████| 1  
71/71 [00:03<00:00, 22.51sample/s]  
Epoch 2/10, Training Loss: 0.717705546114198, Validation Loss: 0.6818273666888307  
Accuracy: 0.5446327683615819, Precision: 0.7035754323831332, Recall: 0.5446327683615  
819, F1-score: 0.4309288851513514  
Epoch 3/10 (Train): 100%|██████████| 1  
17/117 [00:10<00:00, 11.63sample/s]  
Epoch 3/10 (Eval): 100%|██████████| 1  
71/71 [00:03<00:00, 22.50sample/s]  
Epoch 3/10, Training Loss: 0.7045277383860208, Validation Loss: 0.6388629860123672  
Accuracy: 0.6412429378531074, Precision: 0.6723150998621926, Recall: 0.6412429378531  
074, F1-score: 0.6232074653251253  
Epoch 4/10 (Train): 100%|██████████| 1  
17/117 [00:10<00:00, 11.54sample/s]  
Epoch 4/10 (Eval): 100%|██████████| 1  
71/71 [00:03<00:00, 22.46sample/s]  
Epoch 4/10, Training Loss: 0.6986131187658591, Validation Loss: 0.6210837315368114  
Accuracy: 0.6853107344632768, Precision: 0.6854636416641289, Recall: 0.6853107344632  
768, F1-score: 0.6851767600275489  
Epoch 5/10 (Train): 100%|██████████| 1  
17/117 [00:10<00:00, 11.51sample/s]  
Epoch 5/10 (Eval): 100%|██████████| 1  
71/71 [00:03<00:00, 22.61sample/s]  
Epoch 5/10, Training Loss: 0.6794740057833151, Validation Loss: 0.6274474031676007  
Accuracy: 0.6531073446327683, Precision: 0.6965373563181969, Recall: 0.6531073446327  
683, F1-score: 0.6317447148622273  
Epoch 6/10 (Train): 100%|██████████| 1  
17/117 [00:10<00:00, 11.50sample/s]  
Epoch 6/10 (Eval): 100%|██████████| 1  
71/71 [00:03<00:00, 22.24sample/s]  
Epoch 6/10, Training Loss: 0.6759701322475633, Validation Loss: 0.6246103480205698  
Accuracy: 0.6508474576271186, Precision: 0.7068734453732122, Recall: 0.6508474576271  
186, F1-score: 0.624313861538505
```

```
Epoch 7/10 (Train): 100%|██████████| 1  
17/117 [00:10<00:00, 11.60sample/s]  
Epoch 7/10 (Eval): 100%|██████████|  
71/71 [00:03<00:00, 22.46sample/s]  
Epoch 7/10, Training Loss: 0.6702085860262512, Validation Loss: 0.6083653806629827  
Accuracy: 0.6774011299435029, Precision: 0.7088140348955684, Recall: 0.6774011299435029, F1-score: 0.6640233486979289  
Epoch 8/10 (Train): 100%|██████████| 1  
17/117 [00:10<00:00, 11.64sample/s]  
Epoch 8/10 (Eval): 100%|██████████|  
71/71 [00:03<00:00, 22.39sample/s]  
Epoch 8/10, Training Loss: 0.6642531056756268, Validation Loss: 0.6002560457435705  
Accuracy: 0.6836158192090396, Precision: 0.7078360111833404, Recall: 0.6836158192090396, F1-score: 0.6734611402801192  
Epoch 9/10 (Train): 100%|██████████| 1  
17/117 [00:10<00:00, 11.58sample/s]  
Epoch 9/10 (Eval): 100%|██████████|  
71/71 [00:03<00:00, 22.61sample/s]  
Epoch 9/10, Training Loss: 0.6495930718958909, Validation Loss: 0.5855235954967596  
Accuracy: 0.7056497175141243, Precision: 0.7123305906021304, Recall: 0.7056497175141243, F1-score: 0.7030075599115947  
Epoch 10/10 (Train): 100%|██████████| 1  
17/117 [00:10<00:00, 11.57sample/s]  
Epoch 10/10 (Eval): 100%|██████████|  
71/71 [00:03<00:00, 22.44sample/s]  
Epoch 10/10, Training Loss: 0.6515466502629542, Validation Loss: 0.585365777887867  
Accuracy: 0.6937853107344633, Precision: 0.7226480194489004, Recall: 0.6937853107344633, F1-score: 0.6828852684350329  
Тренировка завершена!  
Test: 100%|██████████|  
72/72 [00:04<00:00, 17.24sample/s]  
Test Accuracy: 0.693422519509476  
Precision: 0.7258158790502008, Recall: 0.693422519509476, F1-score: 0.6827734435094508  
Accuracy of cats : 87 %  
Accuracy of dogs : 50 %  
  
Class_name: cats  
Train_count: 900  
Test_count: 300  
Valid_count: 300  
Shutil images: 100%|██████████| 150  
0/1500 [00:00<00:00, 1848.65image/s]  
Class_name: dogs  
Train_count: 900  
Test_count: 300  
Valid_count: 300  
Shutil images: 100%|██████████| 150  
0/1500 [00:00<00:00, 1839.21image/s]
```

-----  
Выбранная модель: vgg16  
Пользовательское название модели: vgg16\_Exp1  
Выбранный оптимизатор: SGD  
-----

```
Epoch 1/10 (Train): 100%|██████████| 1  
17/117 [00:10<00:00, 10.97sample/s]  
Epoch 1/10 (Eval): 100%|██████████| 1  
71/71 [00:03<00:00, 22.05sample/s]  
Epoch 1/10, Training Loss: 0.6948532767292569, Validation Loss: 0.6926880416560308  
Accuracy: 0.5316384180790961, Precision: 0.5318968388866749, Recall: 0.5316384180790  
961, F1-score: 0.5313923980411739  
Epoch 2/10 (Train): 100%|██████████| 1  
17/117 [00:10<00:00, 11.19sample/s]  
Epoch 2/10 (Eval): 100%|██████████| 1  
71/71 [00:03<00:00, 21.97sample/s]  
Epoch 2/10, Training Loss: 0.6957158502076406, Validation Loss: 0.6919740608519753  
Accuracy: 0.5627118644067797, Precision: 0.568880931673066, Recall: 0.56271186440677  
97, F1-score: 0.5506406783267593  
Epoch 3/10 (Train): 100%|██████████| 1  
17/117 [00:11<00:00, 10.48sample/s]  
Epoch 3/10 (Eval): 100%|██████████| 1  
71/71 [00:03<00:00, 21.04sample/s]  
Epoch 3/10, Training Loss: 0.6938698445386148, Validation Loss: 0.6916237956723251  
Accuracy: 0.5152542372881356, Precision: 0.5822358920664006, Recall: 0.5152542372881  
356, F1-score: 0.39886814607326004  
Epoch 4/10 (Train): 100%|██████████| 1  
17/117 [00:10<00:00, 11.02sample/s]  
Epoch 4/10 (Eval): 100%|██████████| 1  
71/71 [00:03<00:00, 21.79sample/s]  
Epoch 4/10, Training Loss: 0.6912809597498101, Validation Loss: 0.6909269779752203  
Accuracy: 0.5949152542372881, Precision: 0.5993306213994527, Recall: 0.5949152542372  
881, F1-score: 0.5911954180791706  
Epoch 5/10 (Train): 100%|██████████| 1  
17/117 [00:10<00:00, 11.14sample/s]  
Epoch 5/10 (Eval): 100%|██████████| 1  
71/71 [00:03<00:00, 21.82sample/s]  
Epoch 5/10, Training Loss: 0.6917215500529945, Validation Loss: 0.6903216214166523  
Accuracy: 0.6033898305084746, Precision: 0.6121953748953837, Recall: 0.6033898305084  
746, F1-score: 0.5964676740853272  
Epoch 6/10 (Train): 100%|██████████| 1  
17/117 [00:10<00:00, 11.12sample/s]  
Epoch 6/10 (Eval): 100%|██████████| 1  
71/71 [00:03<00:00, 21.84sample/s]  
Epoch 6/10, Training Loss: 0.6910088349075003, Validation Loss: 0.6898614587420124  
Accuracy: 0.559322033898305, Precision: 0.6119953319832582, Recall: 0.55932203389830  
5, F1-score: 0.5039624078482673
```

```
Epoch 7/10 (Train): 100%|██████████| 1  
17/117 [00:10<00:00, 11.12sample/s]  
Epoch 7/10 (Eval): 100%|██████████|  
71/71 [00:03<00:00, 21.96sample/s]  
Epoch 7/10, Training Loss: 0.6920777502086083, Validation Loss: 0.6894602723377573  
Accuracy: 0.5344632768361582, Precision: 0.6508713751278254, Recall: 0.5344632768361  
582, F1-score: 0.418954931578758  
Epoch 8/10 (Train): 100%|██████████| 1  
17/117 [00:10<00:00, 11.16sample/s]  
Epoch 8/10 (Eval): 100%|██████████|  
71/71 [00:03<00:00, 21.82sample/s]  
Epoch 8/10, Training Loss: 0.6906419136574858, Validation Loss: 0.6885875613339203  
Accuracy: 0.6124293785310735, Precision: 0.6199160121328265, Recall: 0.6124293785310  
735, F1-score: 0.6071162438192229  
Epoch 9/10 (Train): 100%|██████████| 1  
17/117 [00:10<00:00, 11.08sample/s]  
Epoch 9/10 (Eval): 100%|██████████|  
71/71 [00:03<00:00, 21.50sample/s]  
Epoch 9/10, Training Loss: 0.6893493274125929, Validation Loss: 0.6879444250279227  
Accuracy: 0.56045197740113, Precision: 0.6134145360528583, Recall: 0.56045197740113,  
F1-score: 0.5056527683701622  
Epoch 10/10 (Train): 100%|██████████| 1  
17/117 [00:10<00:00, 11.13sample/s]  
Epoch 10/10 (Eval): 100%|██████████|  
71/71 [00:03<00:00, 21.77sample/s]  
Epoch 10/10, Training Loss: 0.6889255786489509, Validation Loss: 0.6868018379992684  
Accuracy: 0.6209039548022599, Precision: 0.6288136965251035, Recall: 0.6209039548022  
599, F1-score: 0.6157580365312463  
Тренировка завершена!  
Test: 100%|██████████|  
72/72 [00:04<00:00, 17.18sample/s]  
Test Accuracy: 0.6153846153846154  
Precision: 0.6208572851934643, Recall: 0.6153846153846154, F1-score: 0.6100937255809  
283  
Accuracy of cats : 49 %  
Accuracy of dogs : 73 %  
  
Class_name: cats  
Train_count: 900  
Test_count: 300  
Valid_count: 300  
Shutil images: 100%|██████████| 150  
0/1500 [00:00<00:00, 1810.31image/s]  
Class_name: dogs  
Train_count: 900  
Test_count: 300  
Valid_count: 300  
Shutil images: 100%|██████████| 150  
0/1500 [00:00<00:00, 1766.69image/s]
```

-----  
Выбранная модель: vgg16\_bn  
Пользовательское название модели: vgg16\_bn\_Exp1  
Выбранный оптимизатор: SGD  
-----

```
Epoch 1/10 (Train): 100%|██████████| 1  
17/117 [00:10<00:00, 10.79sample/s]  
Epoch 1/10 (Eval): 100%|██████████| 1  
71/71 [00:03<00:00, 21.52sample/s]  
Epoch 1/10, Training Loss: 0.7816290562491126, Validation Loss: 0.7233013866816537  
Accuracy: 0.5022598870056497, Precision: 0.25311852902829973, Recall: 0.502259887005  
6497, F1-score: 0.3366029028371823  
Epoch 2/10 (Train): 100%|██████████| 1  
17/117 [00:10<00:00, 10.77sample/s]  
Epoch 2/10 (Eval): 100%|██████████| 1  
71/71 [00:03<00:00, 21.58sample/s]  
Epoch 2/10, Training Loss: 0.7467889963681769, Validation Loss: 0.7003374770704636  
Accuracy: 0.5084745762711864, Precision: 0.6519947848761408, Recall: 0.5084745762711  
864, F1-score: 0.35120798404676395  
Epoch 3/10 (Train): 100%|██████████| 1  
17/117 [00:11<00:00, 10.62sample/s]  
Epoch 3/10 (Eval): 100%|██████████| 1  
71/71 [00:03<00:00, 21.56sample/s]  
Epoch 3/10, Training Loss: 0.728874298258135, Validation Loss: 0.6676869597812157  
Accuracy: 0.5757062146892655, Precision: 0.6412065285624607, Recall: 0.5757062146892  
655, F1-score: 0.5172977274032539  
Epoch 4/10 (Train): 100%|██████████| 1  
17/117 [00:10<00:00, 10.74sample/s]  
Epoch 4/10 (Eval): 100%|██████████| 1  
71/71 [00:03<00:00, 21.55sample/s]  
Epoch 4/10, Training Loss: 0.7057996045815936, Validation Loss: 0.6572465490823411  
Accuracy: 0.5971751412429378, Precision: 0.6505908935044576, Recall: 0.5971751412429  
378, F1-score: 0.5559128926967061  
Epoch 5/10 (Train): 100%|██████████| 1  
17/117 [00:10<00:00, 10.77sample/s]  
Epoch 5/10 (Eval): 100%|██████████| 1  
71/71 [00:03<00:00, 21.63sample/s]  
Epoch 5/10, Training Loss: 0.7000143486518742, Validation Loss: 0.657103411390283  
Accuracy: 0.5971751412429378, Precision: 0.6858800289340838, Recall: 0.5971751412429  
378, F1-score: 0.5404801548148688  
Epoch 6/10 (Train): 100%|██████████| 1  
17/117 [00:10<00:00, 10.78sample/s]  
Epoch 6/10 (Eval): 100%|██████████| 1  
71/71 [00:03<00:00, 21.70sample/s]  
Epoch 6/10, Training Loss: 0.6960831593576566, Validation Loss: 0.6468242333602097  
Accuracy: 0.6237288135593221, Precision: 0.6630240193029977, Recall: 0.6237288135593  
221, F1-score: 0.5981763599059939
```

```
Epoch 7/10 (Train): 100%|██████████| 1  
17/117 [00:10<00:00, 10.78sample/s]  
Epoch 7/10 (Eval): 100%|██████████| 1  
71/71 [00:03<00:00, 21.49sample/s]  
Epoch 7/10, Training Loss: 0.683623545867601, Validation Loss: 0.6789245815937128  
Accuracy: 0.5514124293785311, Precision: 0.6982817526666029, Recall: 0.5514124293785  
311, F1-score: 0.446323363376499  
Epoch 8/10 (Train): 100%|██████████| 1  
17/117 [00:10<00:00, 10.73sample/s]  
Epoch 8/10 (Eval): 100%|██████████| 1  
71/71 [00:03<00:00, 21.60sample/s]  
Epoch 8/10, Training Loss: 0.6886644898782943, Validation Loss: 0.6255814854034596  
Accuracy: 0.6627118644067796, Precision: 0.6627492545367212, Recall: 0.6627118644067  
96, F1-score: 0.6626372300568889  
Epoch 9/10 (Train): 100%|██████████| 1  
17/117 [00:10<00:00, 10.74sample/s]  
Epoch 9/10 (Eval): 100%|██████████| 1  
71/71 [00:03<00:00, 21.68sample/s]  
Epoch 9/10, Training Loss: 0.6767153366123511, Validation Loss: 0.6212186828508215  
Accuracy: 0.6649717514124294, Precision: 0.6664275774959414, Recall: 0.6649717514124  
294, F1-score: 0.6644358004478259  
Тренировка завершена!  
Test: 100%|██████████| 1  
72/72 [00:04<00:00, 17.73sample/s]  
Test Accuracy: 0.6789297658862876  
Precision: 0.6966182769833588, Recall: 0.6789297658862876, F1-score: 0.6722152331924  
989  
Accuracy of cats : 82 %  
Accuracy of dogs : 53 %  
  
Class_name: cats  
Train_count: 900  
Test_count: 300  
Valid_count: 300  
Shutil images: 100%|██████████| 150  
0/1500 [00:00<00:00, 1808.66image/s]  
Class_name: dogs  
Train_count: 900  
Test_count: 300  
Valid_count: 300  
Shutil images: 100%|██████████| 150  
0/1500 [00:00<00:00, 1772.61image/s]
```

-----  
Выбранная модель: vgg19  
Пользовательское название модели: vgg19\_Exp1  
Выбранный оптимизатор: SGD  
-----

```
Epoch 1/10 (Train): 100%|██████████| 1  
17/117 [00:11<00:00, 10.26sample/s]  
Epoch 1/10 (Eval): 100%|██████████| 1  
71/71 [00:03<00:00, 21.15sample/s]  
Epoch 1/10, Training Loss: 0.6952310940678436, Validation Loss: 0.6930796493918209  
Accuracy: 0.49887005649717514, Precision: 0.6666705100119144, Recall: 0.49887005649717514, F1-score: 0.33555799472486564  
Epoch 2/10 (Train): 100%|██████████| 1  
17/117 [00:11<00:00, 10.48sample/s]  
Epoch 2/10 (Eval): 100%|██████████| 1  
71/71 [00:03<00:00, 21.20sample/s]  
Epoch 2/10, Training Loss: 0.6932033617623952, Validation Loss: 0.6928458991697279  
Accuracy: 0.4966101694915254, Precision: 0.2466216604424016, Recall: 0.4966101694915254, F1-score: 0.329573679866403  
Epoch 3/10 (Train): 100%|██████████| 1  
17/117 [00:11<00:00, 10.39sample/s]  
Epoch 3/10 (Eval): 100%|██████████| 1  
71/71 [00:03<00:00, 21.15sample/s]  
Epoch 3/10, Training Loss: 0.6931703070853981, Validation Loss: 0.6925227291839945  
Accuracy: 0.49830508474576274, Precision: 0.7504302034473829, Recall: 0.49830508474576274, F1-score: 0.3333258014084184  
Epoch 4/10 (Train): 100%|██████████| 1  
17/117 [00:11<00:00, 10.41sample/s]  
Epoch 4/10 (Eval): 100%|██████████| 1  
71/71 [00:03<00:00, 21.23sample/s]  
Epoch 4/10, Training Loss: 0.6933615965496767, Validation Loss: 0.692109311031083  
Accuracy: 0.5887005649717514, Precision: 0.6019582143081335, Recall: 0.5887005649717514, F1-score: 0.5763873137634388  
Epoch 5/10 (Train): 100%|██████████| 1  
17/117 [00:11<00:00, 10.44sample/s]  
Epoch 5/10 (Eval): 100%|██████████| 1  
71/71 [00:03<00:00, 21.21sample/s]  
Epoch 5/10, Training Loss: 0.6924649487626806, Validation Loss: 0.6917814514731283  
Accuracy: 0.5892655367231638, Precision: 0.607596522100647, Recall: 0.5892655367231638, F1-score: 0.572678830700712  
Epoch 6/10 (Train): 100%|██████████| 1  
17/117 [00:11<00:00, 10.37sample/s]  
Epoch 6/10 (Eval): 100%|██████████| 1  
71/71 [00:03<00:00, 21.19sample/s]  
Epoch 6/10, Training Loss: 0.6923884851136708, Validation Loss: 0.6914220667828275  
Accuracy: 0.5627118644067797, Precision: 0.6232592843052979, Recall: 0.5627118644067797, F1-score: 0.4981744107815356
```

```
Epoch 7/10 (Train): 100%|██████████| 1  
17/117 [00:11<00:00, 10.33sample/s]  
Epoch 7/10 (Eval): 100%|██████████|  
71/71 [00:03<00:00, 21.14sample/s]  
Epoch 7/10, Training Loss: 0.6927536631014513, Validation Loss: 0.6910989417531396  
Accuracy: 0.6016949152542372, Precision: 0.6354136981627142, Recall: 0.6016949152542  
372, F1-score: 0.5734640687831317  
Epoch 8/10 (Train): 100%|██████████| 1  
17/117 [00:11<00:00, 10.45sample/s]  
Epoch 8/10 (Eval): 100%|██████████|  
71/71 [00:03<00:00, 21.17sample/s]  
Epoch 8/10, Training Loss: 0.6912502939771348, Validation Loss: 0.6908193505079733  
Accuracy: 0.5785310734463277, Precision: 0.6250645921081605, Recall: 0.5785310734463  
277, F1-score: 0.5377991384797572  
Epoch 9/10 (Train): 100%|██████████| 1  
17/117 [00:11<00:00, 10.42sample/s]  
Epoch 9/10 (Eval): 100%|██████████|  
71/71 [00:03<00:00, 21.16sample/s]  
Epoch 9/10, Training Loss: 0.691650138602345, Validation Loss: 0.6903691020725811  
Accuracy: 0.6220338983050847, Precision: 0.6223547271830031, Recall: 0.6220338983050  
847, F1-score: 0.6219222801859644  
Тренировка завершена!  
Test: 100%|██████████| 1  
72/72 [00:04<00:00, 17.42sample/s]  
Test Accuracy: 0.5345596432552955  
Precision: 0.6100733569941361, Recall: 0.5345596432552955, F1-score: 0.4323541226215  
5865  
Accuracy of cats : 10 %  
Accuracy of dogs : 95 %  
  
Class_name: cats  
Train_count: 900  
Test_count: 300  
Valid_count: 300  
Shutil images: 100%|██████████| 150  
0/1500 [00:00<00:00, 1828.86image/s]  
Class_name: dogs  
Train_count: 900  
Test_count: 300  
Valid_count: 300  
Shutil images: 100%|██████████| 150  
0/1500 [00:00<00:00, 1793.97image/s]
```

-----  
Выбранная модель: vgg19\_bn  
Пользовательское название модели: vgg19\_bn\_Exp1  
Выбранный оптимизатор: SGD  
-----

```
Epoch 1/10 (Train): 100%|██████████| 1  
17/117 [00:11<00:00, 10.02sample/s]  
Epoch 1/10 (Eval): 100%|██████████| 1  
71/71 [00:03<00:00, 20.82sample/s]  
Epoch 1/10, Training Loss: 0.8045748853577254, Validation Loss: 0.7141892839286287  
Accuracy: 0.5050847457627119, Precision: 0.5698659152008031, Recall: 0.5050847457627119, F1-score: 0.34479809416355556  
Epoch 2/10 (Train): 100%|██████████| 1  
17/117 [00:11<00:00, 10.11sample/s]  
Epoch 2/10 (Eval): 100%|██████████| 1  
71/71 [00:03<00:00, 20.33sample/s]  
Epoch 2/10, Training Loss: 0.7474331049129846, Validation Loss: 0.6849092388220426  
Accuracy: 0.5638418079096045, Precision: 0.5710354811934035, Recall: 0.5638418079096045, F1-score: 0.5503930667960618  
Epoch 3/10 (Train): 100%|██████████| 1  
17/117 [00:11<00:00, 9.92sample/s]  
Epoch 3/10 (Eval): 100%|██████████| 1  
71/71 [00:03<00:00, 20.87sample/s]  
Epoch 3/10, Training Loss: 0.7230035945762912, Validation Loss: 0.6851993169488206  
Accuracy: 0.5310734463276836, Precision: 0.6282981584191502, Recall: 0.5310734463276836, F1-score: 0.42613777024645244  
Epoch 4/10 (Train): 100%|██████████| 1  
17/117 [00:11<00:00, 10.00sample/s]  
Epoch 4/10 (Eval): 100%|██████████| 1  
71/71 [00:03<00:00, 20.79sample/s]  
Epoch 4/10, Training Loss: 0.7265581824013106, Validation Loss: 0.6746132188597641  
Accuracy: 0.5932203389830508, Precision: 0.6201705824934366, Recall: 0.5932203389830508, F1-score: 0.567158097713799  
Epoch 5/10 (Train): 100%|██████████| 1  
17/117 [00:11<00:00, 10.08sample/s]  
Epoch 5/10 (Eval): 100%|██████████| 1  
71/71 [00:03<00:00, 20.80sample/s]  
Epoch 5/10, Training Loss: 0.7036334014535359, Validation Loss: 0.6628675629190133  
Accuracy: 0.6305084745762712, Precision: 0.6309762671026276, Recall: 0.6305084745762712, F1-score: 0.6299664223573702  
Epoch 6/10 (Train): 100%|██████████| 1  
17/117 [00:11<00:00, 9.97sample/s]  
Epoch 6/10 (Eval): 100%|██████████| 1  
71/71 [00:03<00:00, 20.87sample/s]  
Epoch 6/10, Training Loss: 0.7110165059362232, Validation Loss: 0.6592006614315982  
Accuracy: 0.637288135593203, Precision: 0.6450479571437907, Recall: 0.637288135593203, F1-score: 0.6317007197178617
```

```
Epoch 7/10 (Train): 100%|██████████| 1  
17/117 [00:11<00:00, 9.99sample/s]  
Epoch 7/10 (Eval): 100%|██████████|  
71/71 [00:03<00:00, 20.79sample/s]  
Epoch 7/10, Training Loss: 0.7024064667425881, Validation Loss: 0.6624373494736893  
Accuracy: 0.5926553672316384, Precision: 0.6678767560849823, Recall: 0.5926553672316  
384, F1-score: 0.539035348625868  
Epoch 8/10 (Train): 100%|██████████| 1  
17/117 [00:11<00:00, 9.97sample/s]  
Epoch 8/10 (Eval): 100%|██████████|  
71/71 [00:03<00:00, 20.85sample/s]  
Epoch 8/10, Training Loss: 0.6926363316441824, Validation Loss: 0.6515307008883374  
Accuracy: 0.6423728813559322, Precision: 0.6570638551396282, Recall: 0.6423728813559  
322, F1-score: 0.6329843718499595  
Epoch 9/10 (Train): 100%|██████████| 1  
17/117 [00:11<00:00, 9.98sample/s]  
Epoch 9/10 (Eval): 100%|██████████|  
71/71 [00:03<00:00, 20.78sample/s]  
Epoch 9/10, Training Loss: 0.6872036904607267, Validation Loss: 0.6505050731580809  
Accuracy: 0.6112994350282486, Precision: 0.6540129415715424, Recall: 0.6112994350282  
486, F1-score: 0.5806651568393207  
Epoch 10/10 (Train): 100%|██████████| 1  
17/117 [00:11<00:00, 9.93sample/s]  
Epoch 10/10 (Eval): 100%|██████████|  
71/71 [00:03<00:00, 20.85sample/s]  
Epoch 10/10, Training Loss: 0.6786273589805841, Validation Loss: 0.6339038112069254  
Accuracy: 0.6598870056497175, Precision: 0.6598905420232133, Recall: 0.6598870056497  
175, F1-score: 0.6598474806572702  
Тренировка завершена!  
Test: 100%|██████████|  
72/72 [00:04<00:00, 17.42sample/s]  
Test Accuracy: 0.6544035674470458  
Precision: 0.6545008096980455, Recall: 0.6544035674470458, F1-score: 0.6544001312750  
707  
Accuracy of cats : 66 %  
Accuracy of dogs : 64 %  
  
Class_name: cats  
Train_count: 900  
Test_count: 300  
Valid_count: 300  
Shutil images: 100%|██████████| 150  
0/1500 [00:00<00:00, 1811.58image/s]  
Class_name: dogs  
Train_count: 900  
Test_count: 300  
Valid_count: 300  
Shutil images: 100%|██████████| 150  
0/1500 [00:00<00:00, 1797.15image/s]
```

-----  
Выбранная модель: vit\_b\_16  
Пользовательское название модели: vit\_b\_16\_Exp1  
Выбранный оптимизатор: SGD  
-----

Epoch 1/10 (Train): 0%|  
| 0/117 [00:00<?, ?sample/s]

07:18:39-895829 ERROR

GraduateModel

Traceback (most recent call last)

```
in graduate:59
  56 |           num_workers=num_workers,
  57 |           pin_memory=pin_memory,
  58 |           seed=seed)
> 59 |           train.graduate()
  60 |     except Exception as ex:
  61 |         log.exception("GraduateModel\"
  62

in graduate:111
 108 |         # Выводим информацию
 109 |         print(self.__str__())
 110 |         # Обучаем
> 111 |         self.train_model()
 112 |         # Тестируем
 113 |         self.evaluate_model()
 114

in train_model:417
 414 |             unit=unit,
 415 |             inputs, labels = inputs.cuda(),
 416 |             self.optimizer.zero_grad()
> 417 |             outputs = self.model(inputs)
 418 |             loss = self.criterion(outputs)
 419 |             loss.backward()
 420 |             self.optimizer.step()

C:\Users\NightMare\PycharmProjects\CVtools\venv\lib\site-packages\torch\nn\functional.py:1130 in _call_impl
 1127 |         # this function, and just call forward
 1128 |         if not (self._backward_hooks or self._global_backward_hooks
 1129 |                 or self._global_forward_hooks or
> 1130 |                 return forward_call(*input, **kwargs)
 1131 |         # Do not call functions when jit is used
 1132 |         full_backward_hooks, non_full_backward_hooks
 1133 |         if self._backward_hooks or self._global_backward_hooks
 1134 |             or self._global_forward_hooks
 1135 |             or self._global_handles)

C:\Users\NightMare\PycharmProjects\CVtools\venv\lib\site-packages\torch\vision\transforms\transforms.py:291 in forward
 288 |
 289 |     def forward(self, x: torch.Tensor):
 290 |         # Reshape and permute the input tensor
> 291 |         x = self._process_input(x)
 292 |         n = x.shape[0]
 293 |
 294 |         # Expand the class token to the full
```

```
C:\Users\NightMare\PycharmProjects\CVtools\venv\lib  
ision_transformer.py:271 in _process_input
```

```
268     def _process_input(self, x: torch.Tensor  
269         n, c, h, w = x.shape  
270         p = self.patch_size  
271     torch._assert(h == self.image_size,  
272         torch._assert(w == self.image_size,  
273             n_h = h // p  
274             n_w = w // p
```

```
C:\Users\NightMare\PycharmProjects\CVtools\venv\lib  
3 in _assert
```

```
830     if type(condition) is not torch.Tensor:  
831         return handle_torch_function(_assert  
832             assert condition, message  
833             #####  
834 # Import most common subpackages
```

**AssertionError:** Wrong image height!

```
Class_name: cats  
Train_count: 900  
Test_count: 300  
Valid_count: 300
```

```
Shutil images: 100%|██████████| 150  
0/1500 [00:00<00:00, 1666.98image/s]
```

```
Class_name: dogs  
Train_count: 900  
Test_count: 300  
Valid_count: 300
```

```
Shutil images: 100%|██████████| 150  
0/1500 [00:00<00:00, 1819.53image/s]
```

---

```
-----  
Выбранная модель: vit_b_32  
Пользовательское название модели: vit_b_32_Exp1  
Выбранный оптимизатор: SGD  
-----
```

```
Epoch 1/10 (Train):  0%|  
| 0/117 [00:00<?, ?sample/s]
```

07:18:42-649170 ERROR

GraduateModel

Traceback (most recent call last)

```
in graduate:59
  56 |         num_workers=num_workers,
  57 |         pin_memory=pin_memory,
  58 |         seed=seed)
> 59 |         train.graduate()
  60 |     except Exception as ex:
  61 |         log.exception("GraduateModel\"
  62 |
```

```
in graduate:111
  108 |         # Выводим информацию
  109 |         print(self.__str__())
  110 |         # Обучаем
> 111 |         self.train_model()
  112 |         # Тестируем
  113 |         self.evaluate_model()
  114 |
```

```
in train_model:417
  414 |             unit=
  415 |             inputs, labels = inputs.cuda()
  416 |             self.optimizer.zero_grad()
> 417 |             outputs = self.model(inputs)
  418 |             loss = self.criterion(outputs)
  419 |             loss.backward()
  420 |             self.optimizer.step()
```

```
C:\Users\NightMare\PycharmProjects\CVtools\venv\lib\site-packages\torch\nn\functional.py:1130 in _call_impl
```

```
1127 |         # this function, and just call forward
1128 |         if not (self._backward_hooks or self._global_backward_hooks
1129 |                 or self._global_forward_hooks or
> 1130 |                 return forward_call(*input, **kwargs)
1131 |             # Do not call functions when jit is used
1132 |             full_backward_hooks, non_full_backward_hooks
1133 |             if self._backward_hooks or self._global_backward_hooks
1134 |                 or self._global_forward_hooks)
```

```
C:\Users\NightMare\PycharmProjects\CVtools\venv\lib\site-packages\torch\vision\models\detection\transformer.py:291 in forward
```

```
288 |
289 |     def forward(self, x: torch.Tensor):
290 |         # Reshape and permute the input tensor
> 291 |         x = self._process_input(x)
292 |         n = x.shape[0]
293 |
294 |         # Expand the class token to the full
```

```
C:\Users\NightMare\PycharmProjects\CVtools\venv\lib\site-packages\vision_transformer.py:271 in _process_input
```

```
268     def _process_input(self, x: torch.Tensor):
269         n, c, h, w = x.shape
270         p = self.patch_size
271     > 271         torch._assert(h == self.image_size,
272         torch._assert(w == self.image_size,
273         n_h = h // p
274         n_w = w // p
```

```
C:\Users\NightMare\PycharmProjects\CVtools\venv\lib\site-packages\torch\util\pytree.py:3 in _assert
```

```
830
831     if type(condition) is not torch.Tensor:
832         return handle_torch_function(_assert)
833     > 833     assert condition, message
834
835 ##### Import most common subpackages
836 # Import most common subpackages
```

**AssertionError:** Wrong image height!

```
Class_name: cats
Train_count: 900
Test_count: 300
Valid_count: 300
```

```
Shutil images: 100%|██████████| 150
0/1500 [00:00<00:00, 1788.33image/s]
```

```
Class_name: dogs
Train_count: 900
Test_count: 300
Valid_count: 300
```

```
Shutil images: 100%|██████████| 150
0/1500 [00:00<00:00, 1788.16image/s]
```

-----

Выбранная модель: wide\_resnet101\_2

Пользовательское название модели: wide\_resnet101\_2\_Exp1

Выбранный оптимизатор: SGD

-----

```
Epoch 1/10 (Train): 100%|██████████| 1
17/117 [00:17<00:00, 6.86sample/s]
Epoch 1/10 (Eval): 100%|██████████| 1
71/71 [00:04<00:00, 16.17sample/s]
```

Epoch 1/10, Training Loss: 0.7380294144929803, Validation Loss: 0.934229871142382  
Accuracy: 0.5, Precision: 0.536893063583815, Recall: 0.5, F1-score: 0.35302693024517  
706

```
Epoch 2/10 (Train): 100%|██████████| 1  
17/117 [00:16<00:00, 6.89sample/s]  
Epoch 2/10 (Eval): 100%|██████████|  
71/71 [00:04<00:00, 16.12sample/s]  
Epoch 2/10, Training Loss: 0.7315943900079577, Validation Loss: 0.7151336259929474  
Accuracy: 0.515819209039548, Precision: 0.5257949135473234, Recall: 0.51581920903954  
8, F1-score: 0.47518621289671836  
Epoch 3/10 (Train): 100%|██████████| 1  
17/117 [00:17<00:00, 6.73sample/s]  
Epoch 3/10 (Eval): 100%|██████████|  
71/71 [00:04<00:00, 15.45sample/s]  
Epoch 3/10, Training Loss: 0.7372078222514342, Validation Loss: 0.6972868708567431  
Accuracy: 0.5203389830508475, Precision: 0.5227409091249682, Recall: 0.5203389830508  
475, F1-score: 0.4992536683985662  
Epoch 4/10 (Train): 100%|██████████| 1  
17/117 [00:17<00:00, 6.68sample/s]  
Epoch 4/10 (Eval): 100%|██████████|  
71/71 [00:04<00:00, 15.55sample/s]  
Epoch 4/10, Training Loss: 0.7303831520923774, Validation Loss: 0.7051393007491268  
Accuracy: 0.5389830508474577, Precision: 0.5510956064375369, Recall: 0.5389830508474  
577, F1-score: 0.5142166180819617  
Epoch 5/10 (Train): 100%|██████████| 1  
17/117 [00:17<00:00, 6.71sample/s]  
Epoch 5/10 (Eval): 100%|██████████|  
71/71 [00:04<00:00, 15.53sample/s]  
Epoch 5/10, Training Loss: 0.7254916418285056, Validation Loss: 0.7121237267208638  
Accuracy: 0.5163841807909605, Precision: 0.5634461635777467, Recall: 0.5163841807909  
605, F1-score: 0.41496972697143547  
Epoch 6/10 (Train): 100%|██████████| 1  
17/117 [00:17<00:00, 6.67sample/s]  
Epoch 6/10 (Eval): 100%|██████████|  
71/71 [00:04<00:00, 15.54sample/s]  
Epoch 00006: reducing learning rate of group 0 to 1.0000e-04.  
Epoch 6/10, Training Loss: 0.7204500173484731, Validation Loss: 0.7190896289496772  
Accuracy: 0.523728813559322, Precision: 0.5477207641997313, Recall: 0.52372881355932  
2, F1-score: 0.44632000188104554  
Epoch 7/10 (Train): 100%|██████████| 1  
17/117 [00:17<00:00, 6.63sample/s]  
Epoch 7/10 (Eval): 100%|██████████|  
71/71 [00:04<00:00, 15.47sample/s]  
Epoch 7/10, Training Loss: 0.705041215058628, Validation Loss: 0.6900109790139279  
Accuracy: 0.5225988700564972, Precision: 0.5225094305061849, Recall: 0.5225988700564  
972, F1-score: 0.5223724347379468  
Epoch 8/10 (Train): 100%|██████████| 1  
17/117 [00:17<00:00, 6.70sample/s]  
Epoch 8/10 (Eval): 100%|██████████|  
71/71 [00:04<00:00, 15.60sample/s]  
Epoch 8/10, Training Loss: 0.7011252563239941, Validation Loss: 0.6841015457096746  
Accuracy: 0.5378531073446328, Precision: 0.5385204769304869, Recall: 0.5378531073446  
328, F1-score: 0.536912683908329
```

```
Epoch 9/10 (Train): 100%|██████████| 1  
17/117 [00:17<00:00, 6.67sample/s]  
Epoch 9/10 (Eval): 100%|██████████| 1  
71/71 [00:04<00:00, 15.62sample/s]  
Epoch 9/10, Training Loss: 0.6994342820704841, Validation Loss: 0.692300681003743  
Accuracy: 0.5451977401129944, Precision: 0.5567418185232155, Recall: 0.5451977401129  
944, F1-score: 0.5243344582668772  
Epoch 10/10 (Train): 100%|██████████| 1  
17/117 [00:17<00:00, 6.59sample/s]  
Epoch 10/10 (Eval): 100%|██████████| 1  
71/71 [00:04<00:00, 15.42sample/s]  
Epoch 10/10, Training Loss: 0.7017252832099622, Validation Loss: 0.6818977018534127  
Accuracy: 0.5497175141242938, Precision: 0.5496727227974973, Recall: 0.5497175141242  
938, F1-score: 0.5495039414037204  
Тренировка завершена!  
Test: 100%|██████████| 1  
72/72 [00:04<00:00, 14.91sample/s]  
Test Accuracy: 0.5373467112597548  
Precision: 0.5375980227939051, Recall: 0.5373467112597548, F1-score: 0.5371776189316  
974  
Accuracy of cats : 55 %  
Accuracy of dogs : 51 %  
  
Class_name: cats  
Train_count: 900  
Test_count: 300  
Valid_count: 300  
Shutil images: 100%|██████████| 150  
0/1500 [00:00<00:00, 1752.96image/s]  
Class_name: dogs  
Train_count: 900  
Test_count: 300  
Valid_count: 300  
Shutil images: 100%|██████████| 150  
0/1500 [00:00<00:00, 1778.26image/s]
```

---

Выбранная модель: wide\_resnet50\_2  
Пользовательское название модели: wide\_resnet50\_2\_Exp1  
Выбранный оптимизатор: SGD

---

```
Epoch 1/10 (Train): 100%|██████████| 1  
17/117 [00:12<00:00, 9.73sample/s]  
Epoch 1/10 (Eval): 100%|██████████| 1  
71/71 [00:03<00:00, 19.00sample/s]  
Epoch 1/10, Training Loss: 0.743294010552909, Validation Loss: 0.7157924537268062  
Accuracy: 0.46779661016949153, Precision: 0.4662302118543178, Recall: 0.467796610169  
49153, F1-score: 0.4580121912426688
```

```
Epoch 2/10 (Train): 100%|██████████| 1  
17/117 [00:11<00:00, 9.85sample/s]  
Epoch 2/10 (Eval): 100%|██████████|  
71/71 [00:03<00:00, 19.10sample/s]  
Epoch 2/10, Training Loss: 0.742680717384758, Validation Loss: 0.7250150391611002  
Accuracy: 0.5112994350282486, Precision: 0.5288452739939691, Recall: 0.5112994350282486, F1-score: 0.4057197926004586  
Epoch 3/10 (Train): 100%|██████████| 1  
17/117 [00:11<00:00, 9.85sample/s]  
Epoch 3/10 (Eval): 100%|██████████|  
71/71 [00:03<00:00, 19.11sample/s]  
Epoch 3/10, Training Loss: 0.7242834419318468, Validation Loss: 0.715143551260738  
Accuracy: 0.5033898305084745, Precision: 0.504314769975787, Recall: 0.5033898305084745, F1-score: 0.4979143783564271  
Epoch 4/10 (Train): 100%|██████████| 1  
17/117 [00:11<00:00, 9.97sample/s]  
Epoch 4/10 (Eval): 100%|██████████|  
71/71 [00:03<00:00, 19.38sample/s]  
Epoch 4/10, Training Loss: 0.7306459710318557, Validation Loss: 0.7917095697195516  
Accuracy: 0.5016949152542373, Precision: 0.4185179838112012, Recall: 0.5016949152542373, F1-score: 0.339328324796919  
Epoch 5/10 (Train): 100%|██████████| 1  
17/117 [00:11<00:00, 9.96sample/s]  
Epoch 5/10 (Eval): 100%|██████████|  
71/71 [00:03<00:00, 19.20sample/s]  
Epoch 5/10, Training Loss: 0.7276089168354777, Validation Loss: 0.7042036866400875  
Accuracy: 0.5045197740112994, Precision: 0.5072249526780365, Recall: 0.5045197740112994, F1-score: 0.482045831433414  
Epoch 6/10 (Train): 100%|██████████| 1  
17/117 [00:11<00:00, 9.88sample/s]  
Epoch 6/10 (Eval): 100%|██████████|  
71/71 [00:03<00:00, 18.90sample/s]  
Epoch 6/10, Training Loss: 0.7298562845765442, Validation Loss: 0.746130911475521  
Accuracy: 0.48983050847457626, Precision: 0.47240416394195933, Recall: 0.48983050847457626, F1-score: 0.37529696642397364  
Epoch 7/10 (Train): 100%|██████████| 1  
17/117 [00:11<00:00, 9.88sample/s]  
Epoch 7/10 (Eval): 100%|██████████|  
71/71 [00:03<00:00, 19.14sample/s]  
Epoch 7/10, Training Loss: 0.719141397883093, Validation Loss: 0.7047227456071282  
Accuracy: 0.511864406779661, Precision: 0.5121786386871132, Recall: 0.511864406779661, F1-score: 0.5113085843683525  
Epoch 8/10 (Train): 100%|██████████| 1  
17/117 [00:11<00:00, 9.91sample/s]  
Epoch 8/10 (Eval): 100%|██████████|  
71/71 [00:03<00:00, 18.94sample/s]  
Epoch 8/10, Training Loss: 0.7209240426708362, Validation Loss: 0.6988748608335937  
Accuracy: 0.507909604519774, Precision: 0.5075430726491955, Recall: 0.507909604519774, F1-score: 0.5001155181369877  
Epoch 9/10 (Train): 100%|██████████| 1  
17/117 [00:11<00:00, 9.92sample/s]  
Epoch 9/10 (Eval): 100%|██████████|  
71/71 [00:03<00:00, 18.81sample/s]
```

```
Epoch 9/10, Training Loss: 0.7269661091957458, Validation Loss: 0.8535891604625573
Accuracy: 0.4966101694915254, Precision: 0.2466216604424016, Recall: 0.4966101694915
254, F1-score: 0.329573679866403
```

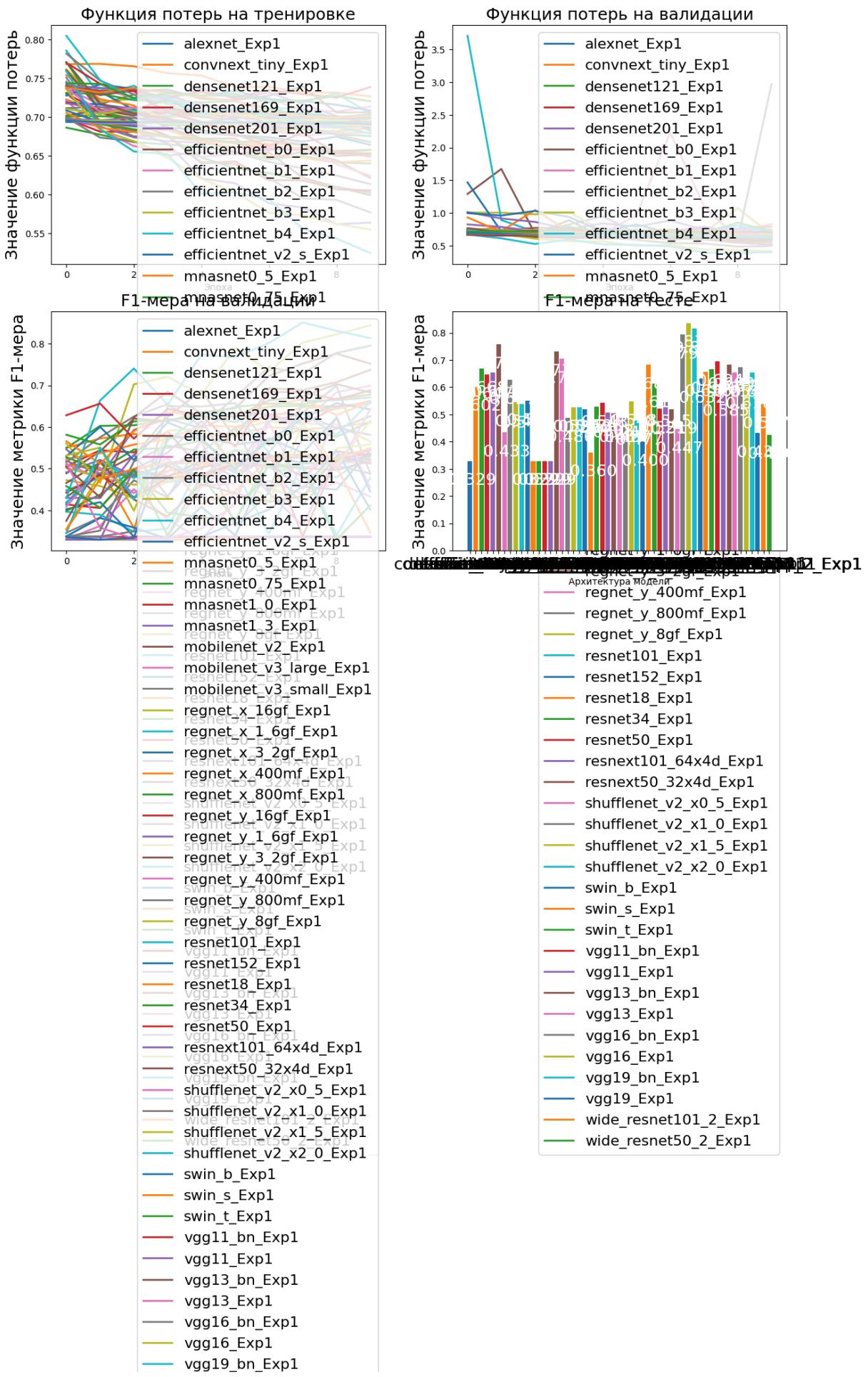
```
Epoch 10/10 (Train): 100%|██████████| 1
17/117 [00:11<00:00, 9.87sample/s]
Epoch 10/10 (Eval): 100%|██████████| 1
71/71 [00:03<00:00, 19.23sample/s]
```

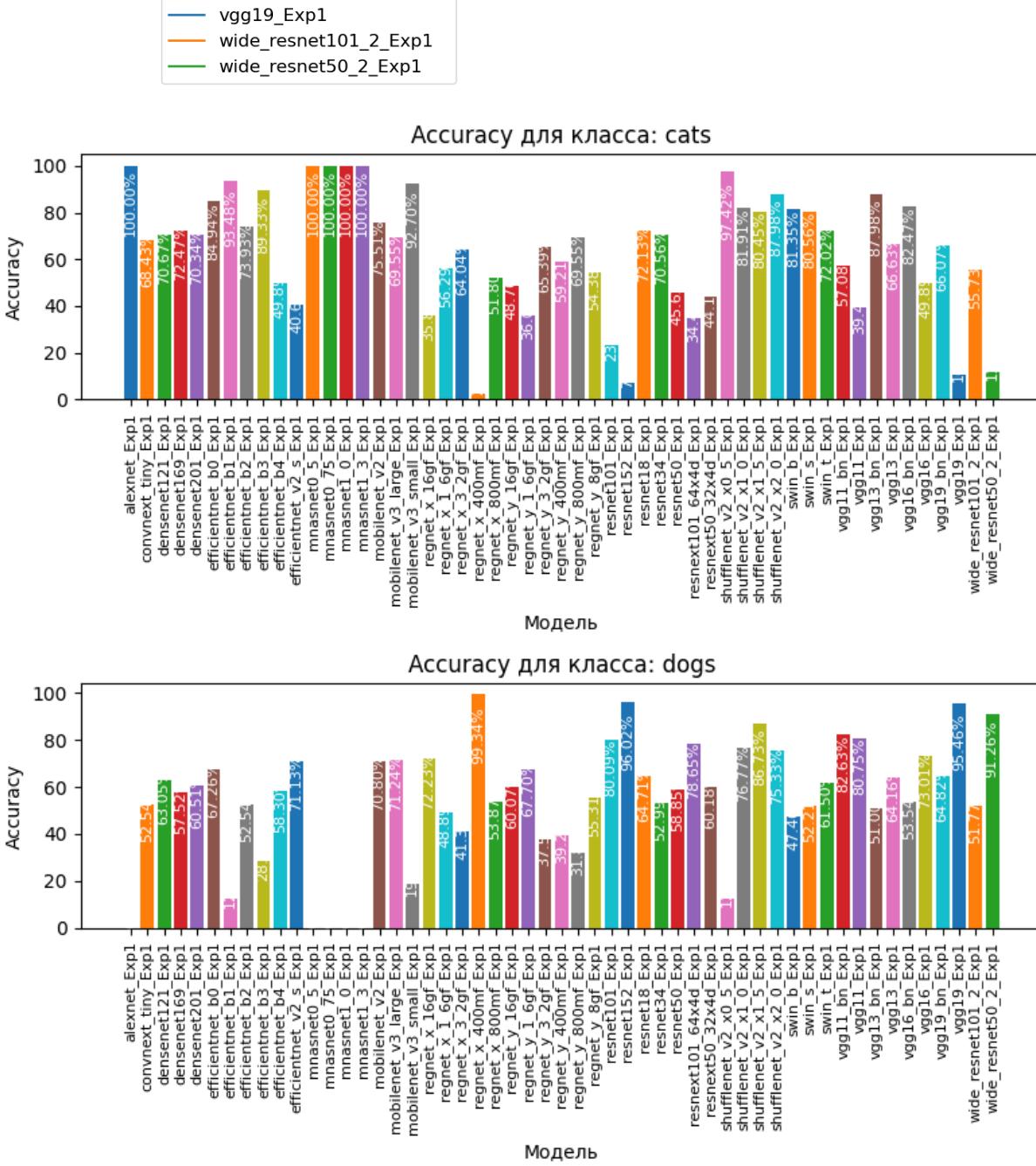
```
Epoch 10/10, Training Loss: 0.7201769473088613, Validation Loss: 0.7211957230406293
Accuracy: 0.5062146892655367, Precision: 0.5252287490417239, Recall: 0.5062146892655
367, F1-score: 0.41183751984803885
```

Тренировка завершена!

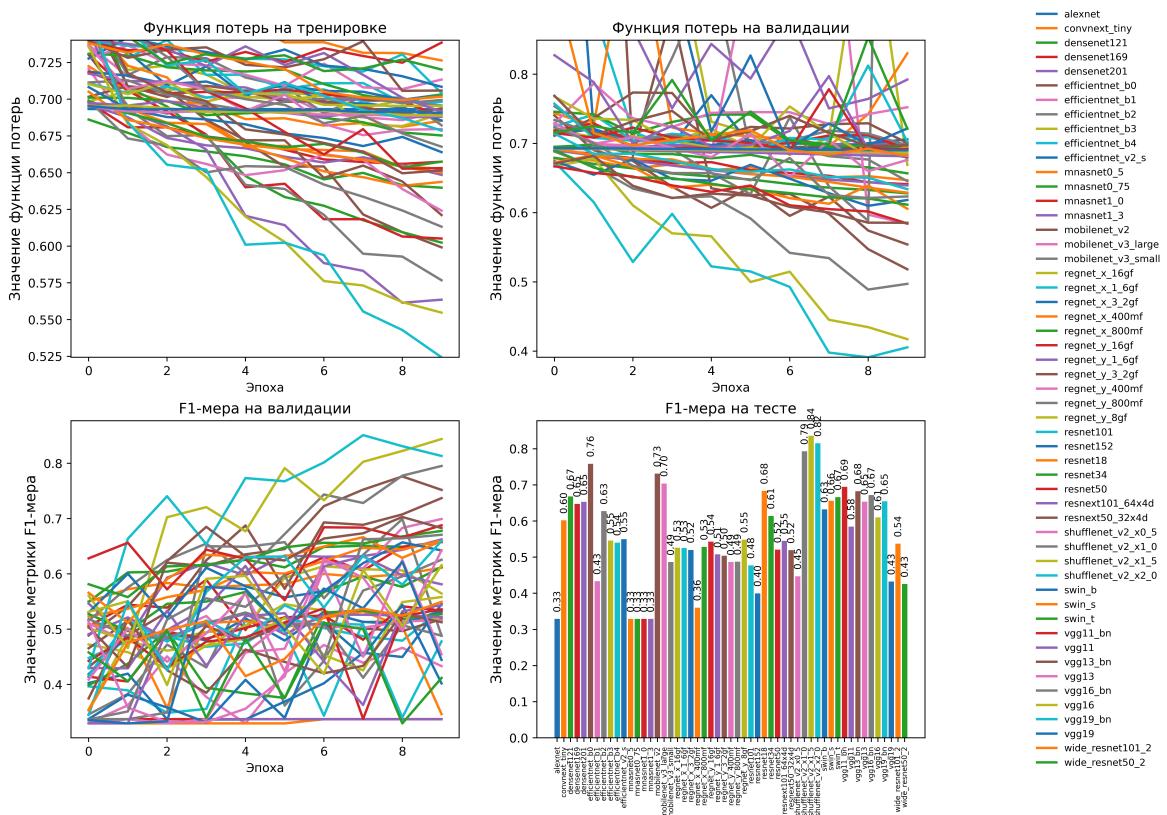
```
Test: 100%|██████████| 1
72/72 [00:04<00:00, 17.22sample/s]
```

```
Test Accuracy: 0.5172798216276477
Precision: 0.53864905547935, Recall: 0.5172798216276477, F1-score: 0.425792589947836
7
Accuracy of cats : 11 %
Accuracy of dogs : 91 %
```

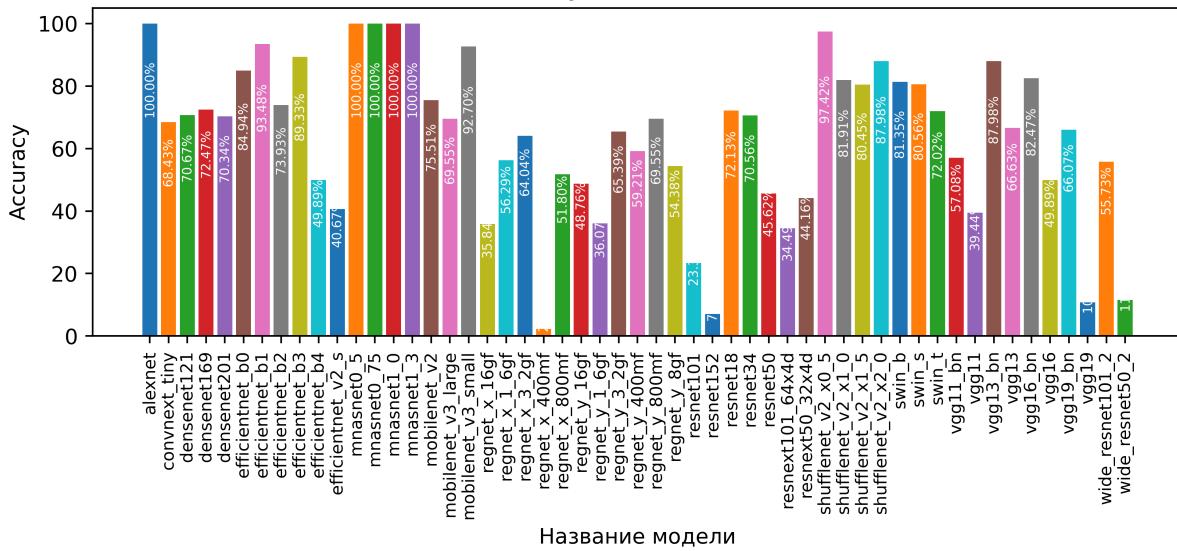




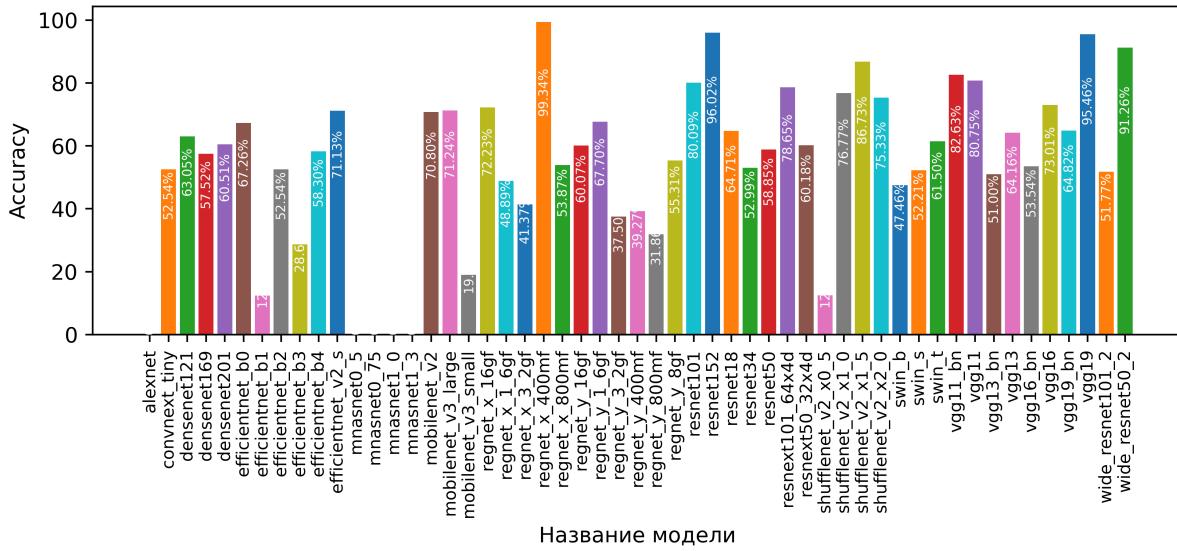
```
In [77]: ipd.display(ipd.Image(filename='./plot/PlotsMetrics_Exp1.png'))
ipd.display(ipd.Image(filename='./plot/AccuracyForClass_Exp1.png'))
```



Accuracy для класса: cats



Accuracy для класса: dogs



## Exp2 / Дисбаланс классов + кроссэнтропия + undersampling

```
In [198... graduate_pipeline = validate_with_pydantic(EntryGraduateModel)(GraduateModelPipel...  
    entry = {  
        "prefix": "Exp2",  
        "models": model_list,  
        "name_optimizers": optimizer_list,  
        "name_loss": "CrossEntropyLoss",  
        "ratio": (70, 15, 15),  
        "size_img": (64, 64),  
        "batch_size": 25,  
        "num_epochs": 10,  
        "class_percentage": {"cats": 0.3, "dogs": 1.0},  
        "resampling_method": "undersampling"  
    }  
)
```

```
In [199... graduate_pipeline.graduate()
```

```
Class_name: cats  
Train_count: 900  
Test_count: 300  
Valid_count: 300  
Shutil images: 100%|██████████| 150  
0/1500 [00:00<00:00, 1884.68image/s]  
Class_name: dogs  
Train_count: 900  
Test_count: 300  
Valid_count: 300  
Shutil images: 100%|██████████| 150  
0/1500 [00:00<00:00, 1831.12image/s]
```

---

```
-----  
Выбранная модель: alexnet  
Пользовательское название модели: alexnet_Exp2  
Выбранный оптимизатор: SGD  
-----
```

```
Epoch 1/10 (Train): 100%|██████████| 1  
17/117 [00:06<00:00, 17.13sample/s]  
Epoch 1/10 (Eval): 100%|██████████| 1  
71/71 [00:03<00:00, 23.10sample/s]  
Epoch 1/10, Training Loss: 0.6931814674249629, Validation Loss: 0.693174991567256  
Accuracy: 0.4966101694915254, Precision: 0.2466216604424016, Recall: 0.4966101694915  
254, F1-score: 0.329573679866403  
Epoch 2/10 (Train): 100%|██████████| 1  
17/117 [00:07<00:00, 15.49sample/s]  
Epoch 2/10 (Eval): 100%|██████████| 1  
71/71 [00:02<00:00, 25.60sample/s]  
Epoch 2/10, Training Loss: 0.6932309001581776, Validation Loss: 0.6931709773459677  
Accuracy: 0.4966101694915254, Precision: 0.2466216604424016, Recall: 0.4966101694915  
254, F1-score: 0.329573679866403
```

```
Epoch 3/10 (Train): 100%|██████████| 1  
17/117 [00:07<00:00, 15.35sample/s]  
Epoch 3/10 (Eval): 100%|██████████| 1  
71/71 [00:02<00:00, 25.13sample/s]  
Epoch 3/10, Training Loss: 0.6931721986978734, Validation Loss: 0.6931651495607559  
Accuracy: 0.4966101694915254, Precision: 0.2466216604424016, Recall: 0.4966101694915  
254, F1-score: 0.329573679866403  
Epoch 4/10 (Train): 100%|██████████| 1  
17/117 [00:07<00:00, 16.18sample/s]  
Epoch 4/10 (Eval): 100%|██████████| 1  
71/71 [00:02<00:00, 26.07sample/s]  
Epoch 00004: reducing learning rate of group 0 to 1.0000e-04.  
  
Epoch 4/10, Training Loss: 0.6931435929745743, Validation Loss: 0.6931603951642742  
Accuracy: 0.4966101694915254, Precision: 0.2466216604424016, Recall: 0.4966101694915  
254, F1-score: 0.329573679866403  
Epoch 5/10 (Train): 100%|██████████| 1  
17/117 [00:07<00:00, 15.77sample/s]  
Epoch 5/10 (Eval): 100%|██████████| 1  
71/71 [00:02<00:00, 25.60sample/s]  
Epoch 5/10, Training Loss: 0.6930850146152719, Validation Loss: 0.6931600863650694  
Accuracy: 0.4966101694915254, Precision: 0.2466216604424016, Recall: 0.4966101694915  
254, F1-score: 0.329573679866403  
Epoch 6/10 (Train): 100%|██████████| 1  
17/117 [00:07<00:00, 15.69sample/s]  
Epoch 6/10 (Eval): 100%|██████████| 1  
71/71 [00:02<00:00, 25.47sample/s]  
Epoch 6/10, Training Loss: 0.6931332054826402, Validation Loss: 0.6931593982176593  
Accuracy: 0.4966101694915254, Precision: 0.2466216604424016, Recall: 0.4966101694915  
254, F1-score: 0.329573679866403  
Epoch 7/10 (Train): 100%|██████████| 1  
17/117 [00:07<00:00, 15.46sample/s]  
Epoch 7/10 (Eval): 100%|██████████| 1  
71/71 [00:02<00:00, 26.72sample/s]  
Epoch 00007: reducing learning rate of group 0 to 1.0000e-05.  
  
Epoch 7/10, Training Loss: 0.6931772539296102, Validation Loss: 0.6931590190378286  
Accuracy: 0.4966101694915254, Precision: 0.2466216604424016, Recall: 0.4966101694915  
254, F1-score: 0.329573679866403  
Epoch 8/10 (Train): 100%|██████████| 1  
17/117 [00:07<00:00, 16.09sample/s]  
Epoch 8/10 (Eval): 100%|██████████| 1  
71/71 [00:02<00:00, 25.29sample/s]  
Epoch 8/10, Training Loss: 0.6931389806811342, Validation Loss: 0.6931589705459142  
Accuracy: 0.4966101694915254, Precision: 0.2466216604424016, Recall: 0.4966101694915  
254, F1-score: 0.329573679866403  
Epoch 9/10 (Train): 100%|██████████| 1  
17/117 [00:07<00:00, 15.06sample/s]  
Epoch 9/10 (Eval): 100%|██████████| 1  
71/71 [00:02<00:00, 24.98sample/s]  
Epoch 9/10, Training Loss: 0.6930486047800464, Validation Loss: 0.6931588898944316  
Accuracy: 0.4966101694915254, Precision: 0.2466216604424016, Recall: 0.4966101694915  
254, F1-score: 0.329573679866403
```

```
Epoch 10/10 (Train): 100%|██████████| 1  
17/117 [00:07<00:00, 14.97sample/s]  
Epoch 10/10 (Eval): 100%|██████████| 1  
71/71 [00:02<00:00, 24.97sample/s]  
Epoch 00010: reducing learning rate of group 0 to 1.0000e-06.  
  
Epoch 10/10, Training Loss: 0.6932090878281806, Validation Loss: 0.693158784828617  
Accuracy: 0.4966101694915254, Precision: 0.2466216604424016, Recall: 0.4966101694915  
254, F1-score: 0.329573679866403  
Тренировка завершена!  
  
Test: 100%|██████████| 1  
72/72 [00:03<00:00, 18.76sample/s]  
Test Accuracy: 0.5039018952062431  
Precision: 0.25391711999244354, Recall: 0.5039018952062431, F1-score: 0.337677771138  
95014  
Accuracy of cats : 0 %  
Accuracy of dogs : 100 %  
  
Class_name: cats  
Train_count: 900  
Test_count: 300  
Valid_count: 300  
  
Shutil images: 100%|██████████| 150  
0/1500 [00:00<00:00, 1800.27image/s]  
Class_name: dogs  
Train_count: 900  
Test_count: 300  
Valid_count: 300  
  
Shutil images: 100%|██████████| 150  
0/1500 [00:00<00:00, 1815.79image/s]
```

---

Выбранная модель: convnext\_tiny  
Пользовательское название модели: convnext\_tiny\_Exp2  
Выбранный оптимизатор: SGD

---

```
Epoch 1/10 (Train): 100%|██████████| 1  
17/117 [00:09<00:00, 12.05sample/s]  
Epoch 1/10 (Eval): 100%|██████████| 1  
71/71 [00:02<00:00, 23.77sample/s]  
Epoch 1/10, Training Loss: 0.7158413800791776, Validation Loss: 0.6807614916798759  
Accuracy: 0.5610169491525424, Precision: 0.5622443110994702, Recall: 0.5610169491525  
424, F1-score: 0.5596448860591721  
  
Epoch 2/10 (Train): 100%|██████████| 1  
17/117 [00:09<00:00, 12.40sample/s]  
Epoch 2/10 (Eval): 100%|██████████| 1  
71/71 [00:03<00:00, 22.90sample/s]  
Epoch 2/10, Training Loss: 0.7044256379719043, Validation Loss: 0.6567615241990925  
Accuracy: 0.5909604519774011, Precision: 0.5927881060179118, Recall: 0.5909604519774  
011, F1-score: 0.5882382559112784
```

```
Epoch 3/10 (Train): 100%|██████████| 1  
17/117 [00:09<00:00, 12.25sample/s]  
Epoch 3/10 (Eval): 100%|██████████|  
71/71 [00:02<00:00, 23.68sample/s]  
Epoch 3/10, Training Loss: 0.6988545148233368, Validation Loss: 0.6667888031504249  
Accuracy: 0.5734463276836158, Precision: 0.5734373677105425, Recall: 0.5734463276836  
158, F1-score: 0.5734402003594427  
Epoch 4/10 (Train): 100%|██████████| 1  
17/117 [00:09<00:00, 11.80sample/s]  
Epoch 4/10 (Eval): 100%|██████████|  
71/71 [00:02<00:00, 24.00sample/s]  
Epoch 4/10, Training Loss: 0.7015762177529613, Validation Loss: 0.7177979339987545  
Accuracy: 0.5502824858757062, Precision: 0.5505233651086012, Recall: 0.5502824858757  
062, F1-score: 0.5501216733081579  
Epoch 5/10 (Train): 100%|██████████| 1  
17/117 [00:09<00:00, 12.71sample/s]  
Epoch 5/10 (Eval): 100%|██████████|  
71/71 [00:02<00:00, 24.25sample/s]  
Epoch 00005: reducing learning rate of group 0 to 1.0000e-04.  
Epoch 5/10, Training Loss: 0.6945822881054633, Validation Loss: 0.6804404810155179  
Accuracy: 0.5858757062146893, Precision: 0.5861572580919274, Recall: 0.5858757062146  
893, F1-score: 0.5851746512269195  
Epoch 6/10 (Train): 100%|██████████| 1  
17/117 [00:09<00:00, 12.51sample/s]  
Epoch 6/10 (Eval): 100%|██████████|  
71/71 [00:03<00:00, 23.46sample/s]  
Epoch 6/10, Training Loss: 0.6849995908868272, Validation Loss: 0.6500731640953129  
Accuracy: 0.6028248587570622, Precision: 0.6038244241634072, Recall: 0.6028248587570  
622, F1-score: 0.601426221636477  
Epoch 7/10 (Train): 100%|██████████| 1  
17/117 [00:09<00:00, 12.25sample/s]  
Epoch 7/10 (Eval): 100%|██████████|  
71/71 [00:02<00:00, 23.79sample/s]  
Epoch 7/10, Training Loss: 0.6829290023374394, Validation Loss: 0.6510033440791955  
Accuracy: 0.6022598870056497, Precision: 0.6027534068216616, Recall: 0.6022598870056  
497, F1-score: 0.6014500278344261  
Epoch 8/10 (Train): 100%|██████████| 1  
17/117 [00:09<00:00, 12.35sample/s]  
Epoch 8/10 (Eval): 100%|██████████|  
71/71 [00:03<00:00, 23.42sample/s]  
Epoch 8/10, Training Loss: 0.6789975544226539, Validation Loss: 0.64969969284063  
Accuracy: 0.6073446327683616, Precision: 0.6076198627008499, Recall: 0.6073446327683  
616, F1-score: 0.6068509483255277  
Epoch 9/10 (Train): 100%|██████████| 1  
17/117 [00:09<00:00, 12.35sample/s]  
Epoch 9/10 (Eval): 100%|██████████|  
71/71 [00:02<00:00, 23.96sample/s]  
Epoch 9/10, Training Loss: 0.6767197316864512, Validation Loss: 0.6489175967240738  
Accuracy: 0.6112994350282486, Precision: 0.6116342098911741, Recall: 0.6112994350282  
486, F1-score: 0.6107625619743402
```

```
Epoch 10/10 (Train): 100%|██████████| 1  
17/117 [00:09<00:00, 12.28sample/s]  
Epoch 10/10 (Eval): 100%|██████████|  
71/71 [00:02<00:00, 23.76sample/s]  
Epoch 10/10, Training Loss: 0.6728057529508453, Validation Loss: 0.6470754713998677  
Accuracy: 0.6214689265536724, Precision: 0.621887771371943, Recall: 0.62146892655367  
24, F1-score: 0.6209136131184069  
Тренировка завершена!  
Test: 100%|██████████|  
72/72 [00:03<00:00, 19.68sample/s]  
Test Accuracy: 0.5964325529542921  
Precision: 0.5977304408981428, Recall: 0.5964325529542921, F1-score: 0.5955733268495  
089  
Accuracy of cats : 64 %  
Accuracy of dogs : 54 %  
  
Class_name: cats  
Train_count: 900  
Test_count: 300  
Valid_count: 300  
  
Shutil images: 100%|██████████| 150  
0/1500 [00:00<00:00, 1827.25image/s]  
Class_name: dogs  
Train_count: 900  
Test_count: 300  
Valid_count: 300  
  
Shutil images: 100%|██████████| 150  
0/1500 [00:00<00:00, 1766.86image/s]
```

---

Выбранная модель: densenet121  
Пользовательское название модели: densenet121\_Exp2  
Выбранный оптимизатор: SGD

---

```
Epoch 1/10 (Train): 100%|██████████| 1  
17/117 [00:18<00:00, 6.21sample/s]  
Epoch 1/10 (Eval): 100%|██████████|  
71/71 [00:04<00:00, 14.24sample/s]  
Epoch 1/10, Training Loss: 0.692605584859848, Validation Loss: 0.6922144824165409  
Accuracy: 0.5316384180790961, Precision: 0.548890447346674, Recall: 0.53163841807909  
61, F1-score: 0.47962912970596244  
  
Epoch 2/10 (Train): 100%|██████████| 1  
17/117 [00:19<00:00, 6.07sample/s]  
Epoch 2/10 (Eval): 100%|██████████|  
71/71 [00:05<00:00, 14.02sample/s]  
Epoch 2/10, Training Loss: 0.6836643526234578, Validation Loss: 0.6868502344452055  
Accuracy: 0.5559322033898305, Precision: 0.5799290004732809, Recall: 0.5559322033898  
305, F1-score: 0.516332406008164
```

Epoch 3/10 (Train): 100% | 1  
17/117 [00:18<00:00, 6.28sample/s]  
Epoch 3/10 (Eval): 100% |  
71/71 [00:05<00:00, 14.03sample/s]  
Epoch 3/10, Training Loss: 0.6804119128337021, Validation Loss: 0.6783054503007123  
Accuracy: 0.5790960451977402, Precision: 0.6051229832793638, Recall: 0.5790960451977402, F1-score: 0.5489815055494979

Epoch 4/10 (Train): 100% | 1  
17/117 [00:19<00:00, 6.07sample/s]  
Epoch 4/10 (Eval): 100% |  
71/71 [00:05<00:00, 13.28sample/s]  
Epoch 4/10, Training Loss: 0.675590928067866, Validation Loss: 0.676143494703002  
Accuracy: 0.5740112994350283, Precision: 0.6285917839701236, Recall: 0.5740112994350283, F1-score: 0.5206318181572996

Epoch 5/10 (Train): 100% | 1  
17/117 [00:19<00:00, 5.92sample/s]  
Epoch 5/10 (Eval): 100% |  
71/71 [00:05<00:00, 13.32sample/s]  
Epoch 5/10, Training Loss: 0.670520141874392, Validation Loss: 0.6702922670181188  
Accuracy: 0.6254237288135593, Precision: 0.6254887804559962, Recall: 0.6254237288135593, F1-score: 0.6252642583451794

Epoch 6/10 (Train): 100% | 1  
17/117 [00:20<00:00, 5.84sample/s]  
Epoch 6/10 (Eval): 100% |  
71/71 [00:05<00:00, 13.44sample/s]  
Epoch 6/10, Training Loss: 0.669218210420248, Validation Loss: 0.6627436657409883  
Accuracy: 0.6276836158192091, Precision: 0.6388849692157749, Recall: 0.6276836158192091, F1-score: 0.6191420682157716

Epoch 7/10 (Train): 100% | 1  
17/117 [00:19<00:00, 5.99sample/s]  
Epoch 7/10 (Eval): 100% |  
71/71 [00:05<00:00, 13.34sample/s]  
Epoch 7/10, Training Loss: 0.664764586695281, Validation Loss: 0.6574968899373954  
Accuracy: 0.6350282485875707, Precision: 0.6387807568452919, Recall: 0.6350282485875707, F1-score: 0.6329922909518388

Epoch 8/10 (Train): 100% | 1  
17/117 [00:19<00:00, 6.09sample/s]  
Epoch 8/10 (Eval): 100% |  
71/71 [00:05<00:00, 13.18sample/s]  
Epoch 8/10, Training Loss: 0.6608014130305588, Validation Loss: 0.6542335031396251  
Accuracy: 0.6333333333333333, Precision: 0.6373114999424427, Recall: 0.6333333333333333, F1-score: 0.6311287948059834

Epoch 9/10 (Train): 100% | 1  
17/117 [00:18<00:00, 6.22sample/s]  
Epoch 9/10 (Eval): 100% |  
71/71 [00:05<00:00, 14.12sample/s]  
Epoch 9/10, Training Loss: 0.6583144326799923, Validation Loss: 0.6507946464975002  
Accuracy: 0.6412429378531074, Precision: 0.6414852472650303, Recall: 0.6412429378531074, F1-score: 0.6409489076675031

Epoch 10/10 (Train): 100% | 1  
17/117 [00:18<00:00, 6.31sample/s]  
Epoch 10/10 (Eval): 100% |  
71/71 [00:04<00:00, 14.22sample/s]

```
Epoch 10/10, Training Loss: 0.6540196797077599, Validation Loss: 0.6444001490786925  
Accuracy: 0.6548022598870057, Precision: 0.65520657641057, Recall: 0.654802259887005  
7, F1-score: 0.6546862083622521  
Тренировка завершена!
```

```
Test: 100%|██████████| 1  
72/72 [00:05<00:00, 13.06sample/s]  
Test Accuracy: 0.6655518394648829  
Precision: 0.6657388524697335, Recall: 0.6655518394648829, F1-score: 0.6653463280711  
421  
Accuracy of cats : 64 %  
Accuracy of dogs : 68 %  
  
Class_name: cats  
Train_count: 900  
Test_count: 300  
Valid_count: 300  
  
Shutil images: 100%|██████████| 150  
0/1500 [00:00<00:00, 1781.30image/s]  
Class_name: dogs  
Train_count: 900  
Test_count: 300  
Valid_count: 300  
  
Shutil images: 100%|██████████| 150  
0/1500 [00:00<00:00, 1734.38image/s]
```

---

```
-----  
Выбранная модель: densenet169  
Пользовательское название модели: densenet169_Exp2  
Выбранный оптимизатор: SGD
```

---

```
Epoch 1/10 (Train): 100%|██████████| 1  
17/117 [00:24<00:00, 4.76sample/s]  
Epoch 1/10 (Eval): 100%|██████████| 1  
71/71 [00:06<00:00, 11.36sample/s]  
Epoch 1/10, Training Loss: 0.7024583691583876, Validation Loss: 0.7007991427418876  
Accuracy: 0.5067796610169492, Precision: 0.5165206646406548, Recall: 0.5067796610169  
492, F1-score: 0.38861458192899584  
  
Epoch 2/10 (Train): 100%|██████████| 1  
17/117 [00:25<00:00, 4.66sample/s]  
Epoch 2/10 (Eval): 100%|██████████| 1  
71/71 [00:06<00:00, 11.18sample/s]  
Epoch 2/10, Training Loss: 0.6866063569829226, Validation Loss: 0.6860766693697138  
Accuracy: 0.5389830508474577, Precision: 0.5503930976115283, Recall: 0.5389830508474  
577, F1-score: 0.5064611007288953  
  
Epoch 3/10 (Train): 100%|██████████| 1  
17/117 [00:25<00:00, 4.66sample/s]  
Epoch 3/10 (Eval): 100%|██████████| 1  
71/71 [00:06<00:00, 11.14sample/s]
```

Epoch 3/10, Training Loss: 0.6827613051814312, Validation Loss: 0.6807093581574112  
Accuracy: 0.5610169491525424, Precision: 0.5645837446451853, Recall: 0.5610169491525424, F1-score: 0.553137774608213

Epoch 4/10 (Train): 100% | ██████████ | 1  
17/117 [00:25<00:00, 4.61sample/s]  
Epoch 4/10 (Eval): 100% | ██████████ |  
71/71 [00:06<00:00, 10.88sample/s]

Epoch 4/10, Training Loss: 0.6744223360957968, Validation Loss: 0.6733713411005203  
Accuracy: 0.5807909604519774, Precision: 0.60693547566184, Recall: 0.5807909604519774, F1-score: 0.5512183048294612

Epoch 5/10 (Train): 100% | ██████████ | 1  
17/117 [00:26<00:00, 4.42sample/s]  
Epoch 5/10 (Eval): 100% | ██████████ |  
71/71 [00:06<00:00, 11.07sample/s]

Epoch 5/10, Training Loss: 0.6755572517508084, Validation Loss: 0.6680725498051293  
Accuracy: 0.5994350282485875, Precision: 0.6105439396785988, Recall: 0.5994350282485875, F1-score: 0.5878210991506957

Epoch 6/10 (Train): 100% | ██████████ | 1  
17/117 [00:25<00:00, 4.56sample/s]  
Epoch 6/10 (Eval): 100% | ██████████ |  
71/71 [00:06<00:00, 10.88sample/s]

Epoch 6/10, Training Loss: 0.6676027775834926, Validation Loss: 0.6609179177189951  
Accuracy: 0.6169491525423729, Precision: 0.6251891433794677, Recall: 0.6169491525423729, F1-score: 0.6096498007166884

Epoch 7/10 (Train): 100% | ██████████ | 1  
17/117 [00:25<00:00, 4.55sample/s]  
Epoch 7/10 (Eval): 100% | ██████████ |  
71/71 [00:06<00:00, 11.42sample/s]

Epoch 7/10, Training Loss: 0.6605208959571275, Validation Loss: 0.6620398482023659  
Accuracy: 0.6033898305084746, Precision: 0.6168497149875922, Recall: 0.6033898305084746, F1-score: 0.5903205653525253

Epoch 8/10 (Train): 100% | ██████████ | 1  
17/117 [00:24<00:00, 4.78sample/s]  
Epoch 8/10 (Eval): 100% | ██████████ |  
71/71 [00:06<00:00, 11.59sample/s]

Epoch 8/10, Training Loss: 0.6580546911024966, Validation Loss: 0.6548001478284092  
Accuracy: 0.6338983050847458, Precision: 0.6354801453961991, Recall: 0.6338983050847458, F1-score: 0.6324824595534724

Epoch 9/10 (Train): 100% | ██████████ | 1  
17/117 [00:24<00:00, 4.79sample/s]  
Epoch 9/10 (Eval): 100% | ██████████ |  
71/71 [00:06<00:00, 11.62sample/s]

Epoch 9/10, Training Loss: 0.661219255211427, Validation Loss: 0.6485027317273415  
Accuracy: 0.6508474576271186, Precision: 0.6523730642661807, Recall: 0.6508474576271186, F1-score: 0.6502067493172656

Epoch 10/10 (Train): 100% | ██████████ | 1  
17/117 [00:24<00:00, 4.76sample/s]  
Epoch 10/10 (Eval): 100% | ██████████ |  
71/71 [00:06<00:00, 11.63sample/s]

Epoch 10/10, Training Loss: 0.6557479495649895, Validation Loss: 0.6476738697054696  
Accuracy: 0.635593220338983, Precision: 0.6444975151151351, Recall: 0.635593220338983, F1-score: 0.6291655280317825

Тренировка завершена!

```
Test: 100%|██████████| 72/72 [00:06<00:00, 11.30sample/s]
Test Accuracy: 0.6443701226309922
Precision: 0.6579691265428675, Recall: 0.6443701226309922, F1-score: 0.6373976939494
619
Accuracy of  cats : 78 %
Accuracy of  dogs : 50 %

Class_name: cats
Train_count: 900
Test_count: 300
Valid_count: 300

Shutil images: 100%|██████████| 0/1500 [00:00<00:00, 1886.64image/s]
Class_name: dogs
Train_count: 900
Test_count: 300
Valid_count: 300

Shutil images: 100%|██████████| 0/1500 [00:00<00:00, 1806.80image/s]
```

Выбранная модель: densenet201  
Пользовательское название модели: densenet201\_Exp2  
Выбранный оптимизатор: SGD

```
Epoch 1/10 (Train): 100%|██████████| 1  
17/117 [00:28<00:00, 4.10sample/s]  
Epoch 1/10 (Eval): 100%|██████████|  
71/71 [00:06<00:00, 10.15sample/s]  
Epoch 1/10, Training Loss: 0.6837973640751593, Validation Loss: 0.69367088655294  
Accuracy: 0.5435028248587571, Precision: 0.5591396508809187, Recall: 0.5435028248587571, F1-score: 0.5152078160890846  
  
Epoch 2/10 (Train): 100%|██████████| 1  
17/117 [00:28<00:00, 4.10sample/s]  
Epoch 2/10 (Eval): 100%|██████████|  
71/71 [00:06<00:00, 10.31sample/s]  
Epoch 2/10, Training Loss: 0.6855568926768614, Validation Loss: 0.675605859628505  
Accuracy: 0.6028248587570622, Precision: 0.6131048871424559, Recall: 0.6028248587570622, F1-score: 0.5946865085904066  
  
Epoch 3/10 (Train): 100%|██████████| 1  
17/117 [00:28<00:00, 4.08sample/s]  
Epoch 3/10 (Eval): 100%|██████████|  
71/71 [00:06<00:00, 10.20sample/s]  
Epoch 3/10, Training Loss: 0.6797584680347508, Validation Loss: 0.6706373044999979  
Accuracy: 0.592090395480226, Precision: 0.633439646045957, Recall: 0.592090395480226, F1-score: 0.5557150090812906
```

Epoch 4/10 (Train): 100% | 1  
17/117 [00:28<00:00, 4.04sample/s]  
Epoch 4/10 (Eval): 100% |  
71/71 [00:07<00:00, 10.08sample/s]  
Epoch 4/10, Training Loss: 0.6692181281822244, Validation Loss: 0.6628867620128697  
Accuracy: 0.6129943502824858, Precision: 0.639498627497378, Recall: 0.6129943502824858, F1-score: 0.5922465066591308

Epoch 5/10 (Train): 100% | 1  
17/117 [00:28<00:00, 4.06sample/s]  
Epoch 5/10 (Eval): 100% |  
71/71 [00:06<00:00, 10.15sample/s]  
Epoch 5/10, Training Loss: 0.6636424267414919, Validation Loss: 0.6529917149557232  
Accuracy: 0.6406779661016949, Precision: 0.6413976795796607, Recall: 0.6406779661016949, F1-score: 0.640395187541633

Epoch 6/10 (Train): 100% | 1  
17/117 [00:28<00:00, 4.06sample/s]  
Epoch 6/10 (Eval): 100% |  
71/71 [00:07<00:00, 10.12sample/s]  
Epoch 6/10, Training Loss: 0.6601723334223953, Validation Loss: 0.6537566306227345  
Accuracy: 0.6192090395480226, Precision: 0.6489550673132485, Recall: 0.6192090395480226, F1-score: 0.5978096836916396

Epoch 7/10 (Train): 100% | 1  
17/117 [00:28<00:00, 4.06sample/s]  
Epoch 7/10 (Eval): 100% |  
71/71 [00:07<00:00, 10.10sample/s]  
Epoch 7/10, Training Loss: 0.6613547665761509, Validation Loss: 0.6469698819400227  
Accuracy: 0.6485875706214689, Precision: 0.6501645634229192, Recall: 0.6485875706214689, F1-score: 0.647908051645679

Epoch 8/10 (Train): 100% | 1  
17/117 [00:28<00:00, 4.05sample/s]  
Epoch 8/10 (Eval): 100% |  
71/71 [00:06<00:00, 10.22sample/s]  
Epoch 8/10, Training Loss: 0.6542108093750026, Validation Loss: 0.6415815733920383  
Accuracy: 0.6468926553672316, Precision: 0.6615929787107666, Recall: 0.6468926553672316, F1-score: 0.6378898890342662

Epoch 9/10 (Train): 100% | 1  
17/117 [00:28<00:00, 4.05sample/s]  
Epoch 9/10 (Eval): 100% |  
71/71 [00:06<00:00, 10.28sample/s]  
Epoch 9/10, Training Loss: 0.6518344211414507, Validation Loss: 0.6328944321406089  
Accuracy: 0.6627118644067796, Precision: 0.6627039553679127, Recall: 0.6627118644067796, F1-score: 0.6626975439714925

Epoch 10/10 (Train): 100% | 1  
17/117 [00:28<00:00, 4.09sample/s]  
Epoch 10/10 (Eval): 100% |  
71/71 [00:07<00:00, 9.93sample/s]  
Epoch 10/10, Training Loss: 0.646435863476029, Validation Loss: 0.6333757255036953  
Accuracy: 0.6638418079096046, Precision: 0.6687606557165533, Recall: 0.6638418079096046, F1-score: 0.6609686406070856  
Тренировка завершена!

Test: 100% |  
72/72 [00:07<00:00, 9.85sample/s]

```
Test Accuracy: 0.6555183946488294
Precision: 0.6657384449138043, Recall: 0.6555183946488294, F1-score: 0.6507883247714
231
Accuracy of cats : 77 %
Accuracy of dogs : 53 %
```

```
Class_name: cats
Train_count: 900
Test_count: 300
Valid_count: 300
```

```
Shutil images: 100%|██████████| 150
0/1500 [00:00<00:00, 1805.60image/s]
```

```
Class_name: dogs
Train_count: 900
Test_count: 300
Valid_count: 300
```

```
Shutil images: 100%|██████████| 150
0/1500 [00:00<00:00, 1828.74image/s]
```

---

```
-----  
Выбранная модель: efficientnet_b0
Пользовательское название модели: efficientnet_b0_Exp2
Выбранный оптимизатор: AdamW
```

---

```
Epoch 1/10 (Train): 100%|██████████| 1
17/117 [00:15<00:00, 7.53sample/s]
Epoch 1/10 (Eval): 100%|██████████| 1
71/71 [00:03<00:00, 20.15sample/s]
```

```
Epoch 1/10, Training Loss: 0.749138676628624, Validation Loss: 1.0664866049747683
Accuracy: 0.5045197740112994, Precision: 0.5282681760072581, Recall: 0.5045197740112
994, F1-score: 0.3932839862168604
```

```
Epoch 2/10 (Train): 100%|██████████| 1
17/117 [00:14<00:00, 8.32sample/s]
Epoch 2/10 (Eval): 100%|██████████| 1
71/71 [00:03<00:00, 20.66sample/s]
```

```
Epoch 2/10, Training Loss: 0.7098214172620544, Validation Loss: 0.9153549043135455
Accuracy: 0.5, Precision: 0.47222844094206146, Recall: 0.5, F1-score: 0.357171881683
621
```

```
Epoch 3/10 (Train): 100%|██████████| 1
17/117 [00:14<00:00, 8.24sample/s]
Epoch 3/10 (Eval): 100%|██████████| 1
71/71 [00:03<00:00, 20.23sample/s]
```

```
Epoch 3/10, Training Loss: 0.6947556214848745, Validation Loss: 0.708807325464184
Accuracy: 0.6192090395480226, Precision: 0.6396553886626918, Recall: 0.6192090395480
226, F1-score: 0.6035112162819302
```

```
Epoch 4/10 (Train): 100%|██████████| 1
17/117 [00:14<00:00, 8.29sample/s]
Epoch 4/10 (Eval): 100%|██████████| 1
71/71 [00:03<00:00, 19.51sample/s]
```

Epoch 4/10, Training Loss: 0.6953255969941411, Validation Loss: 0.7896004819263847  
Accuracy: 0.5384180790960452, Precision: 0.5873589003105626, Recall: 0.5384180790960452, F1-score: 0.45797740766518646

Epoch 5/10 (Train): 100% | ██████████ | 1  
17/117 [00:14<00:00, 8.31sample/s]  
Epoch 5/10 (Eval): 100% | ██████████ |  
71/71 [00:03<00:00, 19.86sample/s]

Epoch 5/10, Training Loss: 0.6711475331963542, Validation Loss: 0.6317703136279758  
Accuracy: 0.635593220338983, Precision: 0.6669509631182982, Recall: 0.635593220338983, F1-score: 0.6164675286468346

Epoch 6/10 (Train): 100% | ██████████ | 1  
17/117 [00:14<00:00, 8.18sample/s]  
Epoch 6/10 (Eval): 100% | ██████████ |  
71/71 [00:03<00:00, 19.57sample/s]

Epoch 6/10, Training Loss: 0.6638246983084891, Validation Loss: 0.6117536687413178  
Accuracy: 0.6858757062146893, Precision: 0.6929341114604445, Recall: 0.6858757062146893, F1-score: 0.682594453424754

Epoch 7/10 (Train): 100% | ██████████ | 1  
17/117 [00:14<00:00, 8.24sample/s]  
Epoch 7/10 (Eval): 100% | ██████████ |  
71/71 [00:03<00:00, 20.11sample/s]

Epoch 7/10, Training Loss: 0.6527267315031327, Validation Loss: 0.5961678141759614  
Accuracy: 0.7135593220338983, Precision: 0.7171035823911841, Recall: 0.7135593220338983, F1-score: 0.712172001803923

Epoch 8/10 (Train): 100% | ██████████ | 1  
17/117 [00:14<00:00, 8.35sample/s]  
Epoch 8/10 (Eval): 100% | ██████████ |  
71/71 [00:03<00:00, 20.18sample/s]

Epoch 8/10, Training Loss: 0.6363657386237404, Validation Loss: 0.6257739584829848  
Accuracy: 0.63954802259887, Precision: 0.7135703723448674, Recall: 0.63954802259887, F1-score: 0.6039710469617852

Epoch 9/10 (Train): 100% | ██████████ | 1  
17/117 [00:14<00:00, 8.34sample/s]  
Epoch 9/10 (Eval): 100% | ██████████ |  
71/71 [00:03<00:00, 20.37sample/s]

Epoch 9/10, Training Loss: 0.6298258232906512, Validation Loss: 0.6044600235540315  
Accuracy: 0.6954802259887005, Precision: 0.6961099035249187, Recall: 0.6954802259887005, F1-score: 0.6951215277974362

Epoch 10/10 (Train): 100% | ██████████ | 1  
17/117 [00:14<00:00, 7.86sample/s]  
Epoch 10/10 (Eval): 100% | ██████████ |  
71/71 [00:03<00:00, 19.83sample/s]

Epoch 10/10, Training Loss: 0.6154163595020157, Validation Loss: 0.5407121828888769  
Accuracy: 0.7418079096045198, Precision: 0.7446784006953499, Recall: 0.7418079096045198, F1-score: 0.740898695999815

Тренировка завершена!

Test: 100% | ██████████ |  
72/72 [00:03<00:00, 18.04sample/s]

```
Test Accuracy: 0.7324414715719063
Precision: 0.7355970392959362, Recall: 0.7324414715719063, F1-score: 0.7317248802667
585
Accuracy of cats : 78 %
Accuracy of dogs : 67 %
```

```
Class_name: cats
```

```
Train_count: 900
```

```
Test_count: 300
```

```
Valid_count: 300
```

```
Shutil images: 100%|██████████| 150
0/1500 [00:00<00:00, 1779.51image/s]
```

```
Class_name: dogs
```

```
Train_count: 900
```

```
Test_count: 300
```

```
Valid_count: 300
```

```
Shutil images: 100%|██████████| 150
0/1500 [00:00<00:00, 1845.33image/s]
```

---

```
-----
```

Выбранная модель: efficientnet\_b1

Пользовательское название модели: efficientnet\_b1\_Exp2

Выбранный оптимизатор: AdamW

```
-----
```

```
Epoch 1/10 (Train): 100%|██████████| 1
17/117 [00:19<00:00, 6.05sample/s]
Epoch 1/10 (Eval): 100%|██████████| 1
71/71 [00:04<00:00, 17.11sample/s]
```

```
Epoch 1/10, Training Loss: 0.7463788028640026, Validation Loss: 0.729595124216403
Accuracy: 0.503954802259887, Precision: 0.53732810158779, Recall: 0.503954802259887,
F1-score: 0.341341765935156
```

```
Epoch 2/10 (Train): 100%|██████████| 1
17/117 [00:19<00:00, 5.99sample/s]
Epoch 2/10 (Eval): 100%|██████████| 1
71/71 [00:04<00:00, 17.32sample/s]
```

```
Epoch 2/10, Training Loss: 0.7001921878647559, Validation Loss: 0.6868365927267883
Accuracy: 0.5870056497175141, Precision: 0.6290907018331302, Recall: 0.5870056497175
141, F1-score: 0.5480770539786264
```

```
Epoch 3/10 (Train): 100%|██████████| 1
17/117 [00:21<00:00, 5.55sample/s]
Epoch 3/10 (Eval): 100%|██████████| 1
71/71 [00:04<00:00, 16.30sample/s]
```

```
Epoch 3/10, Training Loss: 0.6923723389807436, Validation Loss: 0.6671227819502017
Accuracy: 0.5672316384180791, Precision: 0.6653311503027265, Recall: 0.5672316384180
791, F1-score: 0.48890759474883366
```

```
Epoch 4/10 (Train): 100%|██████████| 1
17/117 [00:21<00:00, 5.44sample/s]
Epoch 4/10 (Eval): 100%|██████████| 1
71/71 [00:04<00:00, 16.52sample/s]
```

```
Epoch 4/10, Training Loss: 0.6874698134222391, Validation Loss: 0.6660603109726124
Accuracy: 0.6084745762711864, Precision: 0.6403870056497175, Recall: 0.6084745762711
864, F1-score: 0.5832663594070051
Epoch 5/10 (Train): 100%|██████████| 1
17/117 [00:19<00:00, 6.05sample/s]
Epoch 5/10 (Eval): 100%|██████████| 1
71/71 [00:04<00:00, 17.33sample/s]
Epoch 5/10, Training Loss: 0.685835478027252, Validation Loss: 0.6483485058876081
Accuracy: 0.6485875706214689, Precision: 0.663595038316399, Recall: 0.64858757062146
89, F1-score: 0.6395619577233772
Epoch 6/10 (Train): 100%|██████████| 1
17/117 [00:19<00:00, 6.01sample/s]
Epoch 6/10 (Eval): 100%|██████████| 1
71/71 [00:04<00:00, 17.60sample/s]
Epoch 6/10, Training Loss: 0.6797763992011342, Validation Loss: 1.1039432130627713
Accuracy: 0.6192090395480226, Precision: 0.6197367058622874, Recall: 0.6192090395480
226, F1-score: 0.6189779959616337
Epoch 7/10 (Train): 100%|██████████| 1
17/117 [00:19<00:00, 5.97sample/s]
Epoch 7/10 (Eval): 100%|██████████| 1
71/71 [00:04<00:00, 17.43sample/s]
Epoch 7/10, Training Loss: 0.6907715296622404, Validation Loss: 0.6565896270975555
Accuracy: 0.6288135593220339, Precision: 0.6544811879816631, Recall: 0.6288135593220
339, F1-score: 0.6115419091929483
Epoch 8/10 (Train): 100%|██████████| 1
17/117 [00:19<00:00, 6.01sample/s]
Epoch 8/10 (Eval): 100%|██████████| 1
71/71 [00:03<00:00, 17.90sample/s]
Epoch 00008: reducing learning rate of group 0 to 1.0000e-04.

Epoch 8/10, Training Loss: 0.6749170172665128, Validation Loss: 0.7003844647252627
Accuracy: 0.6259887005649718, Precision: 0.6665396481378033, Recall: 0.6259887005649
718, F1-score: 0.6003455033098863
Epoch 9/10 (Train): 100%|██████████| 1
17/117 [00:19<00:00, 6.07sample/s]
Epoch 9/10 (Eval): 100%|██████████| 1
71/71 [00:03<00:00, 17.76sample/s]
Epoch 9/10, Training Loss: 0.6486331397520307, Validation Loss: 0.6429249465802295
Accuracy: 0.6740112994350282, Precision: 0.6813283556829671, Recall: 0.6740112994350
282, F1-score: 0.6702525347742063
Epoch 10/10 (Train): 100%|██████████| 1
17/117 [00:19<00:00, 6.08sample/s]
Epoch 10/10 (Eval): 100%|██████████| 1
71/71 [00:04<00:00, 17.69sample/s]
Epoch 10/10, Training Loss: 0.6414099973194378, Validation Loss: 0.6210367494383774
Accuracy: 0.6898305084745763, Precision: 0.6920960600142521, Recall: 0.6898305084745
763, F1-score: 0.688695952134865
Тренировка завершена!
Test: 100%|██████████| 1
72/72 [00:04<00:00, 16.80sample/s]
```

```
Test Accuracy: 0.6950947603121517
Precision: 0.6989034413742365, Recall: 0.6950947603121517, F1-score: 0.6939069515249
71
Accuracy of cats : 75 %
Accuracy of dogs : 63 %
```

```
Class_name: cats
```

```
Train_count: 900
```

```
Test_count: 300
```

```
Valid_count: 300
```

```
Shutil images: 100%|██████████| 150
0/1500 [00:00<00:00, 1854.06image/s]
```

```
Class_name: dogs
```

```
Train_count: 900
```

```
Test_count: 300
```

```
Valid_count: 300
```

```
Shutil images: 100%|██████████| 150
0/1500 [00:00<00:00, 1839.93image/s]
```

---

```
-----
```

Выбранная модель: efficientnet\_b2

Пользовательское название модели: efficientnet\_b2\_Exp2

Выбранный оптимизатор: AdamW

```
-----
```

```
Epoch 1/10 (Train): 100%|██████████| 1
17/117 [00:19<00:00, 6.02sample/s]
Epoch 1/10 (Eval): 100%|██████████| 1
71/71 [00:04<00:00, 17.71sample/s]
```

```
Epoch 1/10, Training Loss: 0.7654934352411028, Validation Loss: 0.7636379877389488
Accuracy: 0.5033898305084745, Precision: 0.5017083365288748, Recall: 0.5033898305084
745, F1-score: 0.3381089121383465
```

```
Epoch 2/10 (Train): 100%|██████████| 1
17/117 [00:19<00:00, 6.04sample/s]
Epoch 2/10 (Eval): 100%|██████████| 1
71/71 [00:04<00:00, 17.57sample/s]
```

```
Epoch 2/10, Training Loss: 0.7376464948416576, Validation Loss: 0.6797716408799597
Accuracy: 0.5666666666666666, Precision: 0.6344283780589992, Recall: 0.5666666666666666
667, F1-score: 0.5010757505366963
```

```
Epoch 3/10 (Train): 100%|██████████| 1
17/117 [00:19<00:00, 5.98sample/s]
Epoch 3/10 (Eval): 100%|██████████| 1
71/71 [00:04<00:00, 17.68sample/s]
```

```
Epoch 3/10, Training Loss: 0.7124950366536367, Validation Loss: 0.876119735382371
Accuracy: 0.615819209039548, Precision: 0.6450365124905714, Recall: 0.61581920903954
8, F1-score: 0.5940048970514914
```

```
Epoch 4/10 (Train): 100%|██████████| 1
17/117 [00:19<00:00, 6.04sample/s]
Epoch 4/10 (Eval): 100%|██████████| 1
71/71 [00:04<00:00, 17.69sample/s]
```

Epoch 4/10, Training Loss: 0.6884466109611734, Validation Loss: 0.6766829199373385  
Accuracy: 0.6254237288135593, Precision: 0.6275924250471667, Recall: 0.6254237288135  
593, F1-score: 0.6242048683288696

Epoch 5/10 (Train): 100% | ██████████ | 1  
17/117 [00:19<00:00, 5.89sample/s]

Epoch 5/10 (Eval): 100% | ██████████ |  
71/71 [00:03<00:00, 18.41sample/s]

Epoch 5/10, Training Loss: 0.6761509233323979, Validation Loss: 0.6273410900332833  
Accuracy: 0.656497175141243, Precision: 0.6775699239443584, Recall: 0.65649717514124  
3, F1-score: 0.6451779255474863

Epoch 6/10 (Train): 100% | ██████████ | 1  
17/117 [00:20<00:00, 5.73sample/s]

Epoch 6/10 (Eval): 100% | ██████████ |  
71/71 [00:03<00:00, 17.91sample/s]

Epoch 6/10, Training Loss: 0.6726289609658349, Validation Loss: 0.6529625534674542  
Accuracy: 0.6644067796610169, Precision: 0.6667898503513464, Recall: 0.6644067796610  
169, F1-score: 0.6634617963261105

Epoch 7/10 (Train): 100% | ██████████ | 1  
17/117 [00:17<00:00, 6.56sample/s]

Epoch 7/10 (Eval): 100% | ██████████ |  
71/71 [00:03<00:00, 18.58sample/s]

Epoch 7/10, Training Loss: 0.6702549897928008, Validation Loss: 0.6457486974317476  
Accuracy: 0.652542372881356, Precision: 0.6698460854264185, Recall: 0.65254237288135  
6, F1-score: 0.6442146439781442

Epoch 8/10 (Train): 100% | ██████████ | 1  
17/117 [00:19<00:00, 6.02sample/s]

Epoch 8/10 (Eval): 100% | ██████████ |  
71/71 [00:03<00:00, 17.87sample/s]

Epoch 00008: reducing learning rate of group 0 to 1.0000e-04.

Epoch 8/10, Training Loss: 0.6704238657279522, Validation Loss: 0.6575164507001133  
Accuracy: 0.6468926553672316, Precision: 0.6792798793511108, Recall: 0.6468926553672  
316, F1-score: 0.6291412060286666

Epoch 9/10 (Train): 100% | ██████████ | 1  
17/117 [00:19<00:00, 6.01sample/s]

Epoch 9/10 (Eval): 100% | ██████████ |  
71/71 [00:03<00:00, 17.94sample/s]

Epoch 9/10, Training Loss: 0.6466438635108397, Validation Loss: 0.6077124757618554  
Accuracy: 0.6892655367231638, Precision: 0.6925257154883075, Recall: 0.6892655367231  
638, F1-score: 0.6876856709503879

Epoch 10/10 (Train): 100% | ██████████ | 1  
17/117 [00:17<00:00, 6.57sample/s]

Epoch 10/10 (Eval): 100% | ██████████ |  
71/71 [00:03<00:00, 18.30sample/s]

Epoch 10/10, Training Loss: 0.6344436240155262, Validation Loss: 0.5946963703901754  
Accuracy: 0.7056497175141243, Precision: 0.7103927660838475, Recall: 0.7056497175141  
243, F1-score: 0.7037181348324233

Тренировка завершена!

Test: 100% | ██████████ |  
72/72 [00:04<00:00, 17.52sample/s]

```
Test Accuracy: 0.7090301003344481
Precision: 0.7136954262640807, Recall: 0.7090301003344481, F1-score: 0.7077055293626
253
Accuracy of cats : 77 %
Accuracy of dogs : 64 %
```

```
Class_name: cats
```

```
Train_count: 900
```

```
Test_count: 300
```

```
Valid_count: 300
```

```
Shutil images: 100%|██████████| 150
0/1500 [00:00<00:00, 1882.85image/s]
```

```
Class_name: dogs
```

```
Train_count: 900
```

```
Test_count: 300
```

```
Valid_count: 300
```

```
Shutil images: 100%|██████████| 150
0/1500 [00:00<00:00, 1879.62image/s]
```

---

```
Выбранная модель: efficientnet_b3
```

```
Пользовательское название модели: efficientnet_b3_Exp2
```

```
Выбранный оптимизатор: AdamW
```

---

```
Epoch 1/10 (Train): 100%|██████████| 1
17/117 [00:19<00:00, 5.99sample/s]
```

```
Epoch 1/10 (Eval): 100%|██████████| 1
71/71 [00:04<00:00, 16.88sample/s]
```

```
Epoch 1/10, Training Loss: 0.7432301546290159, Validation Loss: 0.8333296460957177
Accuracy: 0.5028248587570622, Precision: 0.4850239026510213, Recall: 0.5028248587570
622, F1-score: 0.3437506045530486
```

```
Epoch 2/10 (Train): 100%|██████████| 1
17/117 [00:19<00:00, 5.99sample/s]
```

```
Epoch 2/10 (Eval): 100%|██████████| 1
71/71 [00:04<00:00, 17.49sample/s]
```

```
Epoch 2/10, Training Loss: 0.7146007876420758, Validation Loss: 0.6953407004054657
Accuracy: 0.5649717514124294, Precision: 0.6270531528543283, Recall: 0.5649717514124
294, F1-score: 0.5012321180103375
```

```
Epoch 3/10 (Train): 100%|██████████| 1
17/117 [00:19<00:00, 5.93sample/s]
```

```
Epoch 3/10 (Eval): 100%|██████████| 1
71/71 [00:04<00:00, 17.50sample/s]
```

```
Epoch 3/10, Training Loss: 0.718561224306572, Validation Loss: 0.734674283508527
Accuracy: 0.5497175141242938, Precision: 0.6018369890824378, Recall: 0.549717514124
2938, F1-score: 0.48760609093400087
```

```
Epoch 4/10 (Train): 100%|██████████| 1
17/117 [00:19<00:00, 5.92sample/s]
```

```
Epoch 4/10 (Eval): 100%|██████████| 1
71/71 [00:04<00:00, 17.60sample/s]
```

Epoch 4/10, Training Loss: 0.7049319540307284, Validation Loss: 0.707861856047043  
Accuracy: 0.5875706214689266, Precision: 0.6562359390400603, Recall: 0.5875706214689  
266, F1-score: 0.5342949448555728

Epoch 5/10 (Train): 100% | ██████████ | 1  
17/117 [00:19<00:00, 6.01sample/s]  
Epoch 5/10 (Eval): 100% | ██████████ |  
71/71 [00:04<00:00, 17.62sample/s]

Epoch 00005: reducing learning rate of group 0 to 1.0000e-04.

Epoch 5/10, Training Loss: 0.7112829640149251, Validation Loss: 0.7105270305932578  
Accuracy: 0.49491525423728816, Precision: 0.4950598511280519, Recall: 0.494915254237  
28816, F1-score: 0.4947346431375542

Epoch 6/10 (Train): 100% | ██████████ | 1  
17/117 [00:19<00:00, 6.03sample/s]  
Epoch 6/10 (Eval): 100% | ██████████ |  
71/71 [00:04<00:00, 17.45sample/s]

Epoch 6/10, Training Loss: 0.7035585590654222, Validation Loss: 0.6876335298947696  
Accuracy: 0.5485875706214689, Precision: 0.562277503212245, Recall: 0.5485875706214  
89, F1-score: 0.5257184801993483

Epoch 7/10 (Train): 100% | ██████████ | 1  
17/117 [00:19<00:00, 6.04sample/s]  
Epoch 7/10 (Eval): 100% | ██████████ |  
71/71 [00:04<00:00, 17.56sample/s]

Epoch 7/10, Training Loss: 0.6994280426977426, Validation Loss: 0.6868569972151417  
Accuracy: 0.5485875706214689, Precision: 0.5752276038223837, Recall: 0.5485875706214  
689, F1-score: 0.5086745209776353

Epoch 8/10 (Train): 100% | ██████████ | 1  
17/117 [00:19<00:00, 6.02sample/s]  
Epoch 8/10 (Eval): 100% | ██████████ |  
71/71 [00:04<00:00, 17.60sample/s]

Epoch 8/10, Training Loss: 0.6935002343965969, Validation Loss: 0.6840530236562093  
Accuracy: 0.5519774011299435, Precision: 0.5718856579011805, Recall: 0.551977401129  
9435, F1-score: 0.5220963950179407

Epoch 9/10 (Train): 100% | ██████████ | 1  
17/117 [00:19<00:00, 6.01sample/s]  
Epoch 9/10 (Eval): 100% | ██████████ |  
71/71 [00:04<00:00, 17.58sample/s]

Epoch 9/10, Training Loss: 0.6886044501029339, Validation Loss: 0.6814884760622251  
Accuracy: 0.5514124293785311, Precision: 0.5643821539610119, Recall: 0.551412429378  
5311, F1-score: 0.5307180805609676

Epoch 10/10 (Train): 100% | ██████████ | 1  
17/117 [00:19<00:00, 6.04sample/s]  
Epoch 10/10 (Eval): 100% | ██████████ |  
71/71 [00:04<00:00, 17.50sample/s]

Epoch 10/10, Training Loss: 0.6899579857632876, Validation Loss: 0.6781816551577573  
Accuracy: 0.5734463276836158, Precision: 0.5872907977004234, Recall: 0.5734463276836  
158, F1-score: 0.5578200198844703

Тренировка завершена!

Test: 100% | ██████████ |  
72/72 [00:04<00:00, 16.23sample/s]

```
Test Accuracy: 0.5668896321070234
Precision: 0.5771975384578361, Recall: 0.5668896321070234, F1-score: 0.5493208445279
179
Accuracy of cats : 36 %
Accuracy of dogs : 76 %
```

```
Class_name: cats
Train_count: 900
Test_count: 300
Valid_count: 300
```

```
Shutil images: 100%|██████████| 150
0/1500 [00:00<00:00, 1840.38image/s]
```

```
Class_name: dogs
Train_count: 900
Test_count: 300
Valid_count: 300
```

```
Shutil images: 100%|██████████| 150
0/1500 [00:00<00:00, 1846.39image/s]
```

---

```
-----
```

Выбранная модель: efficientnet\_b4

Пользовательское название модели: efficientnet\_b4\_Exp2

Выбранный оптимизатор: AdamW

```
-----
```

```
Epoch 1/10 (Train): 100%|██████████| 1
17/117 [00:23<00:00, 5.08sample/s]
Epoch 1/10 (Eval): 100%|██████████| 1
71/71 [00:04<00:00, 15.61sample/s]
```

```
Epoch 1/10, Training Loss: 0.7762936950241986, Validation Loss: 0.7024360393400246
Accuracy: 0.5028248587570622, Precision: 0.4824753880733353, Recall: 0.5028248587570
622, F1-score: 0.3427810130363789
```

```
Epoch 2/10 (Train): 100%|██████████| 1
17/117 [00:23<00:00, 5.04sample/s]
Epoch 2/10 (Eval): 100%|██████████| 1
71/71 [00:04<00:00, 15.59sample/s]
```

```
Epoch 2/10, Training Loss: 0.7319332827202643, Validation Loss: 0.71291868986383
Accuracy: 0.5033898305084745, Precision: 0.5017083365288748, Recall: 0.5033898305084
745, F1-score: 0.3381089121383465
```

```
Epoch 3/10 (Train): 100%|██████████| 1
17/117 [00:22<00:00, 5.09sample/s]
Epoch 3/10 (Eval): 100%|██████████| 1
71/71 [00:04<00:00, 15.52sample/s]
```

```
Epoch 3/10, Training Loss: 0.7594195352387183, Validation Loss: 1.563033408195959
Accuracy: 0.5129943502824859, Precision: 0.5507339855307269, Recall: 0.5129943502824
859, F1-score: 0.38984125084732163
```

```
Epoch 4/10 (Train): 100%|██████████| 1
17/117 [00:23<00:00, 5.08sample/s]
Epoch 4/10 (Eval): 100%|██████████| 1
71/71 [00:04<00:00, 15.44sample/s]
```

Epoch 00004: reducing learning rate of group 0 to 1.0000e-04.

Epoch 4/10, Training Loss: 0.7287507367502782, Validation Loss: 1.6695345297539974  
Accuracy: 0.5152542372881356, Precision: 0.5763247096482286, Recall: 0.5152542372881  
356, F1-score: 0.38553596772059623

Epoch 5/10 (Train): 100% | ██████████ | 1  
17/117 [00:22<00:00, 5.11sample/s]  
Epoch 5/10 (Eval): 100% | ██████████ |  
71/71 [00:04<00:00, 15.41sample/s]

Epoch 5/10, Training Loss: 0.6841389538905874, Validation Loss: 0.7280887976541357  
Accuracy: 0.5966101694915255, Precision: 0.5987854360609387, Recall: 0.5966101694915  
255, F1-score: 0.5936950777795509

Epoch 6/10 (Train): 100% | ██████████ | 1  
17/117 [00:22<00:00, 5.12sample/s]  
Epoch 6/10 (Eval): 100% | ██████████ |  
71/71 [00:04<00:00, 15.61sample/s]

Epoch 6/10, Training Loss: 0.6781663051790389, Validation Loss: 0.6889511990008381  
Accuracy: 0.6152542372881356, Precision: 0.6188133158642651, Recall: 0.6152542372881  
356, F1-score: 0.6117165519180907

Epoch 7/10 (Train): 100% | ██████████ | 1  
17/117 [00:22<00:00, 5.10sample/s]  
Epoch 7/10 (Eval): 100% | ██████████ |  
71/71 [00:04<00:00, 15.53sample/s]

Epoch 7/10, Training Loss: 0.6794775854476129, Validation Loss: 0.685285269035458  
Accuracy: 0.6310734463276836, Precision: 0.6428035951812847, Recall: 0.6310734463276  
836, F1-score: 0.62247830737011

Epoch 8/10 (Train): 100% | ██████████ | 1  
17/117 [00:23<00:00, 5.07sample/s]  
Epoch 8/10 (Eval): 100% | ██████████ |  
71/71 [00:04<00:00, 15.64sample/s]

Epoch 8/10, Training Loss: 0.6652305556326797, Validation Loss: 0.6721764459448346  
Accuracy: 0.6367231638418079, Precision: 0.6395727962467483, Recall: 0.6367231638418  
079, F1-score: 0.6352412876391054

Epoch 9/10 (Train): 100% | ██████████ | 1  
17/117 [00:22<00:00, 5.11sample/s]  
Epoch 9/10 (Eval): 100% | ██████████ |  
71/71 [00:04<00:00, 15.53sample/s]

Epoch 9/10, Training Loss: 0.6600066088524061, Validation Loss: 0.7178541087666473  
Accuracy: 0.6440677966101694, Precision: 0.6605954431199429, Recall: 0.6440677966101  
694, F1-score: 0.6338193883626387

Epoch 10/10 (Train): 100% | ██████████ | 1  
17/117 [00:22<00:00, 5.09sample/s]  
Epoch 10/10 (Eval): 100% | ██████████ |  
71/71 [00:04<00:00, 15.35sample/s]

Epoch 10/10, Training Loss: 0.6713954540052774, Validation Loss: 0.6713048148963411  
Accuracy: 0.6711864406779661, Precision: 0.6727980451015185, Recall: 0.6711864406779  
661, F1-score: 0.670614641462452

Тренировка завершена!

Test: 100% | ██████████ |  
72/72 [00:05<00:00, 14.10sample/s]

```
Test Accuracy: 0.6822742474916388
Precision: 0.6834474316298578, Recall: 0.6822742474916388, F1-score: 0.6815639609221
61
Accuracy of cats : 63 %
Accuracy of dogs : 72 %
```

```
Class_name: cats
Train_count: 900
Test_count: 300
Valid_count: 300
```

```
Shutil images: 100%|██████████| 150
0/1500 [00:00<00:00, 1881.36image/s]
```

```
Class_name: dogs
Train_count: 900
Test_count: 300
Valid_count: 300
```

```
Shutil images: 100%|██████████| 150
0/1500 [00:00<00:00, 1863.72image/s]
```

---

```
-----
```

Выбранная модель: efficientnet\_v2\_s

Пользовательское название модели: efficientnet\_v2\_s\_Exp2

Выбранный оптимизатор: AdamW

---

```
Epoch 1/10 (Train): 100%|██████████| 1
17/117 [00:25<00:00, 4.63sample/s]
Epoch 1/10 (Eval): 100%|██████████| 1
71/71 [00:04<00:00, 14.40sample/s]
```

```
Epoch 1/10, Training Loss: 0.7479674347077858, Validation Loss: 0.6993999417218785
Accuracy: 0.4966101694915254, Precision: 0.4982157718461383, Recall: 0.4966101694915
254, F1-score: 0.3738168078672774
```

```
Epoch 2/10 (Train): 100%|██████████| 1
17/117 [00:25<00:00, 4.64sample/s]
Epoch 2/10 (Eval): 100%|██████████| 1
71/71 [00:04<00:00, 14.36sample/s]
```

```
Epoch 2/10, Training Loss: 0.7344732399248995, Validation Loss: 0.9756477293321641
Accuracy: 0.5220338983050847, Precision: 0.5434376369892495, Recall: 0.522033898305
0847, F1-score: 0.44516740461689697
```

```
Epoch 3/10 (Train): 100%|██████████| 1
17/117 [00:25<00:00, 4.64sample/s]
Epoch 3/10 (Eval): 100%|██████████| 1
71/71 [00:04<00:00, 14.35sample/s]
```

```
Epoch 3/10, Training Loss: 0.7208067191015813, Validation Loss: 0.7722052441815198
Accuracy: 0.5163841807909605, Precision: 0.531384721373633, Recall: 0.51638418079096
05, F1-score: 0.4618681840226658
```

```
Epoch 4/10 (Train): 100%|██████████| 1
17/117 [00:25<00:00, 4.58sample/s]
Epoch 4/10 (Eval): 100%|██████████| 1
71/71 [00:04<00:00, 14.37sample/s]
```

Epoch 00004: reducing learning rate of group 0 to 1.0000e-04.

Epoch 4/10, Training Loss: 0.7073947141055799, Validation Loss: 0.7253563006718954  
Accuracy: 0.5186440677966102, Precision: 0.5584517610449355, Recall: 0.5186440677966102, F1-score: 0.42847861685993566

Epoch 5/10 (Train): 100% | ██████████ | 1  
17/117 [00:25<00:00, 4.66sample/s]  
Epoch 5/10 (Eval): 100% | ██████████ |  
71/71 [00:04<00:00, 14.35sample/s]

Epoch 5/10, Training Loss: 0.698939267609947, Validation Loss: 0.6997664585962133  
Accuracy: 0.5288135593220339, Precision: 0.5663569866693307, Recall: 0.5288135593220339, F1-score: 0.45764040262539774

Epoch 6/10 (Train): 100% | ██████████ | 1  
17/117 [00:25<00:00, 4.66sample/s]  
Epoch 6/10 (Eval): 100% | ██████████ |  
71/71 [00:04<00:00, 14.37sample/s]

Epoch 6/10, Training Loss: 0.7014646871188253, Validation Loss: 0.7048116506493024  
Accuracy: 0.4994350282485876, Precision: 0.49470449592098803, Recall: 0.4994350282485876, F1-score: 0.43379143946948373

Epoch 7/10 (Train): 100% | ██████████ | 1  
17/117 [00:25<00:00, 4.66sample/s]  
Epoch 7/10 (Eval): 100% | ██████████ |  
71/71 [00:04<00:00, 14.45sample/s]

Epoch 7/10, Training Loss: 0.6951975006213302, Validation Loss: 0.6962522541062307  
Accuracy: 0.5389830508474577, Precision: 0.5685689541077505, Recall: 0.5389830508474577, F1-score: 0.488234275039217

Epoch 8/10 (Train): 100% | ██████████ | 1  
17/117 [00:25<00:00, 4.63sample/s]  
Epoch 8/10 (Eval): 100% | ██████████ |  
71/71 [00:04<00:00, 14.43sample/s]

Epoch 8/10, Training Loss: 0.6974929886585248, Validation Loss: 0.6911638084441255  
Accuracy: 0.5378531073446328, Precision: 0.56388638508578, Recall: 0.5378531073446328, F1-score: 0.49053656603678714

Epoch 9/10 (Train): 100% | ██████████ | 1  
17/117 [00:25<00:00, 4.66sample/s]  
Epoch 9/10 (Eval): 100% | ██████████ |  
71/71 [00:04<00:00, 14.36sample/s]

Epoch 9/10, Training Loss: 0.7009995779425827, Validation Loss: 0.790858037559326  
Accuracy: 0.5259887005649717, Precision: 0.5588868867082961, Recall: 0.5259887005649717, F1-score: 0.45616843810244645

Epoch 10/10 (Train): 100% | ██████████ | 1  
17/117 [00:25<00:00, 4.65sample/s]  
Epoch 10/10 (Eval): 100% | ██████████ |  
71/71 [00:04<00:00, 14.38sample/s]

Epoch 10/10, Training Loss: 0.6927484234993401, Validation Loss: 0.6911541590582853  
Accuracy: 0.5451977401129944, Precision: 0.5744517373478999, Recall: 0.5451977401129944, F1-score: 0.49995073167543186

Тренировка завершена!

Test: 100% | ██████████ |  
72/72 [00:05<00:00, 13.65sample/s]

```
Test Accuracy: 0.5512820512820513
Precision: 0.573258717439517, Recall: 0.5512820512820513, F1-score: 0.51037564999012
05
Accuracy of cats : 26 %
Accuracy of dogs : 83 %
```

```
Class_name: cats
```

```
Train_count: 900
```

```
Test_count: 300
```

```
Valid_count: 300
```

```
Shutil images: 100%|██████████| 150
0/1500 [00:00<00:00, 1750.58image/s]
```

```
Class_name: dogs
```

```
Train_count: 900
```

```
Test_count: 300
```

```
Valid_count: 300
```

```
Shutil images: 100%|██████████| 150
0/1500 [00:00<00:00, 1890.23image/s]
```

---

```
Выбранная модель: mnasnet0_5
```

```
Пользовательское название модели: mnasnet0_5_Exp2
```

```
Выбранный оптимизатор: AdamW
```

---

```
Epoch 1/10 (Train): 100%|██████████| 1
17/117 [00:11<00:00, 10.61sample/s]
```

```
Epoch 1/10 (Eval): 100%|██████████| 1
71/71 [00:02<00:00, 24.09sample/s]
```

```
Epoch 1/10, Training Loss: 0.7360328554697463, Validation Loss: 0.6931283633924473
Accuracy: 0.5033898305084745, Precision: 0.25340132145935074, Recall: 0.503389830508
4745, F1-score: 0.3371066057745591
```

```
Epoch 2/10 (Train): 100%|██████████| 1
17/117 [00:11<00:00, 10.54sample/s]
```

```
Epoch 2/10 (Eval): 100%|██████████| 1
71/71 [00:03<00:00, 23.65sample/s]
```

```
Epoch 2/10, Training Loss: 0.70058133645156, Validation Loss: 0.6931272911823402
Accuracy: 0.5033898305084745, Precision: 0.25340132145935074, Recall: 0.503389830508
4745, F1-score: 0.3371066057745591
```

```
Epoch 3/10 (Train): 100%|██████████| 1
17/117 [00:10<00:00, 10.66sample/s]
```

```
Epoch 3/10 (Eval): 100%|██████████| 1
71/71 [00:02<00:00, 24.27sample/s]
```

```
Epoch 3/10, Training Loss: 0.7034945778830355, Validation Loss: 0.6932482380988234
Accuracy: 0.5033898305084745, Precision: 0.25340132145935074, Recall: 0.503389830508
4745, F1-score: 0.3371066057745591
```

```
Epoch 4/10 (Train): 100%|██████████| 1
17/117 [00:10<00:00, 10.77sample/s]
```

```
Epoch 4/10 (Eval): 100%|██████████| 1
71/71 [00:02<00:00, 24.07sample/s]
```

Epoch 00004: reducing learning rate of group 0 to 1.0000e-04.

Epoch 4/10, Training Loss: 0.6839493295990724, Validation Loss: 0.6934812688558115  
Accuracy: 0.5033898305084745, Precision: 0.25340132145935074, Recall: 0.5033898305084745, F1-score: 0.3371066057745591

Epoch 5/10 (Train): 100% | 1  
17/117 [00:10<00:00, 10.78sample/s]  
Epoch 5/10 (Eval): 100% |  
71/71 [00:02<00:00, 24.23sample/s]

Epoch 5/10, Training Loss: 0.6578062625275445, Validation Loss: 0.6935605339411288  
Accuracy: 0.5033898305084745, Precision: 0.25340132145935074, Recall: 0.5033898305084745, F1-score: 0.3371066057745591

Epoch 6/10 (Train): 100% | 1  
17/117 [00:10<00:00, 10.79sample/s]  
Epoch 6/10 (Eval): 100% |  
71/71 [00:02<00:00, 24.20sample/s]

Epoch 6/10, Training Loss: 0.6516136817915743, Validation Loss: 0.6940888708594155  
Accuracy: 0.5033898305084745, Precision: 0.25340132145935074, Recall: 0.5033898305084745, F1-score: 0.3371066057745591

Epoch 7/10 (Train): 100% | 1  
17/117 [00:10<00:00, 10.82sample/s]  
Epoch 7/10 (Eval): 100% |  
71/71 [00:02<00:00, 23.98sample/s]

Epoch 00007: reducing learning rate of group 0 to 1.0000e-05.

Epoch 7/10, Training Loss: 0.6511596742364549, Validation Loss: 0.6942008536750988  
Accuracy: 0.5033898305084745, Precision: 0.25340132145935074, Recall: 0.5033898305084745, F1-score: 0.3371066057745591

Epoch 8/10 (Train): 100% | 1  
17/117 [00:10<00:00, 10.77sample/s]  
Epoch 8/10 (Eval): 100% |  
71/71 [00:02<00:00, 24.30sample/s]

Epoch 8/10, Training Loss: 0.6395336311707382, Validation Loss: 0.6942943233554646  
Accuracy: 0.5033898305084745, Precision: 0.25340132145935074, Recall: 0.5033898305084745, F1-score: 0.3371066057745591

Epoch 9/10 (Train): 100% | 1  
17/117 [00:10<00:00, 10.85sample/s]  
Epoch 9/10 (Eval): 100% |  
71/71 [00:02<00:00, 23.71sample/s]

Epoch 9/10, Training Loss: 0.6412743871769135, Validation Loss: 0.694412255522895  
Accuracy: 0.5033898305084745, Precision: 0.25340132145935074, Recall: 0.5033898305084745, F1-score: 0.3371066057745591

Epoch 10/10 (Train): 100% | 1  
17/117 [00:11<00:00, 10.63sample/s]  
Epoch 10/10 (Eval): 100% |  
71/71 [00:02<00:00, 24.13sample/s]

Epoch 00010: reducing learning rate of group 0 to 1.0000e-06.

Epoch 10/10, Training Loss: 0.6404752129131985, Validation Loss: 0.6947164587718618  
Accuracy: 0.5033898305084745, Precision: 0.25340132145935074, Recall: 0.5033898305084745, F1-score: 0.3371066057745591

Тренировка завершена!

Test: 100% |  
72/72 [00:03<00:00, 22.08sample/s]

```
Test Accuracy: 0.496098104793757
Precision: 0.2461133295799575, Recall: 0.496098104793757, F1-score: 0.32900693984086
715
Accuracy of cats : 100 %
Accuracy of dogs : 0 %
```

```
Class_name: cats
```

```
Train_count: 900
```

```
Test_count: 300
```

```
Valid_count: 300
```

```
Shutil images: 100%|██████████| 150
0/1500 [00:00<00:00, 1879.58image/s]
```

```
Class_name: dogs
```

```
Train_count: 900
```

```
Test_count: 300
```

```
Valid_count: 300
```

```
Shutil images: 100%|██████████| 150
0/1500 [00:00<00:00, 1846.13image/s]
```

---

```
-----
```

Выбранная модель: mnasnet0\_75

Пользовательское название модели: mnasnet0\_75\_Exp2

Выбранный оптимизатор: AdamW

```
-----
```

```
Epoch 1/10 (Train): 100%|██████████| 1
17/117 [00:10<00:00, 10.65sample/s]
Epoch 1/10 (Eval): 100%|██████████| 1
71/71 [00:03<00:00, 23.50sample/s]
```

```
Epoch 1/10, Training Loss: 0.741831852500791, Validation Loss: 0.6932276330761991
Accuracy: 0.4966101694915254, Precision: 0.2466216604424016, Recall: 0.4966101694915
254, F1-score: 0.329573679866403
```

```
Epoch 2/10 (Train): 100%|██████████| 1
17/117 [00:10<00:00, 10.71sample/s]
Epoch 2/10 (Eval): 100%|██████████| 1
71/71 [00:02<00:00, 24.03sample/s]
```

```
Epoch 2/10, Training Loss: 0.707395330122656, Validation Loss: 0.6932363193587395
Accuracy: 0.4966101694915254, Precision: 0.2466216604424016, Recall: 0.4966101694915
254, F1-score: 0.329573679866403
```

```
Epoch 3/10 (Train): 100%|██████████| 1
17/117 [00:10<00:00, 10.74sample/s]
Epoch 3/10 (Eval): 100%|██████████| 1
71/71 [00:02<00:00, 23.90sample/s]
```

```
Epoch 3/10, Training Loss: 0.7102815359318789, Validation Loss: 0.6931463873992532
Accuracy: 0.5033898305084745, Precision: 0.25340132145935074, Recall: 0.503389830508
4745, F1-score: 0.3371066057745591
```

```
Epoch 4/10 (Train): 100%|██████████| 1
17/117 [00:10<00:00, 10.73sample/s]
Epoch 4/10 (Eval): 100%|██████████| 1
71/71 [00:02<00:00, 23.83sample/s]
```

```
Epoch 4/10, Training Loss: 0.682721359008776, Validation Loss: 0.6937459252648435
Accuracy: 0.5033898305084745, Precision: 0.25340132145935074, Recall: 0.503389830508
4745, F1-score: 0.3371066057745591
Epoch 5/10 (Train): 100%|██████████| 1
17/117 [00:10<00:00, 10.66sample/s]
Epoch 5/10 (Eval): 100%|██████████| 1
71/71 [00:02<00:00, 23.67sample/s]
Epoch 5/10, Training Loss: 0.6749208766160552, Validation Loss: 0.6933071727806566
Accuracy: 0.5033898305084745, Precision: 0.25340132145935074, Recall: 0.503389830508
4745, F1-score: 0.3371066057745591
Epoch 6/10 (Train): 100%|██████████| 1
17/117 [00:11<00:00, 10.63sample/s]
Epoch 6/10 (Eval): 100%|██████████| 1
71/71 [00:02<00:00, 23.78sample/s]
Epoch 00006: reducing learning rate of group 0 to 1.0000e-04.

Epoch 6/10, Training Loss: 0.685646894563924, Validation Loss: 0.6939103285134849
Accuracy: 0.5033898305084745, Precision: 0.25340132145935074, Recall: 0.503389830508
4745, F1-score: 0.3371066057745591
Epoch 7/10 (Train): 100%|██████████| 1
17/117 [00:10<00:00, 10.65sample/s]
Epoch 7/10 (Eval): 100%|██████████| 1
71/71 [00:02<00:00, 23.76sample/s]
Epoch 7/10, Training Loss: 0.6404635385446942, Validation Loss: 0.693784591505083
Accuracy: 0.5033898305084745, Precision: 0.25340132145935074, Recall: 0.503389830508
4745, F1-score: 0.3371066057745591
Epoch 8/10 (Train): 100%|██████████| 1
17/117 [00:10<00:00, 10.73sample/s]
Epoch 8/10 (Eval): 100%|██████████| 1
71/71 [00:02<00:00, 23.84sample/s]
Epoch 8/10, Training Loss: 0.6358194388065141, Validation Loss: 0.6938369806203465
Accuracy: 0.5033898305084745, Precision: 0.25340132145935074, Recall: 0.503389830508
4745, F1-score: 0.3371066057745591
Epoch 9/10 (Train): 100%|██████████| 1
17/117 [00:10<00:00, 10.73sample/s]
Epoch 9/10 (Eval): 100%|██████████| 1
71/71 [00:02<00:00, 23.77sample/s]
Epoch 00009: reducing learning rate of group 0 to 1.0000e-05.

Epoch 9/10, Training Loss: 0.6230291797942722, Validation Loss: 0.6940717193703193
Accuracy: 0.5033898305084745, Precision: 0.25340132145935074, Recall: 0.503389830508
4745, F1-score: 0.3371066057745591
Epoch 10/10 (Train): 100%|██████████| 1
17/117 [00:11<00:00, 10.53sample/s]
Epoch 10/10 (Eval): 100%|██████████| 1
71/71 [00:03<00:00, 23.59sample/s]
Epoch 10/10, Training Loss: 0.6210896464455169, Validation Loss: 0.6942062381297182
Accuracy: 0.5033898305084745, Precision: 0.25340132145935074, Recall: 0.503389830508
4745, F1-score: 0.3371066057745591
Тренировка завершена!

Test: 100%|██████████| 1
72/72 [00:03<00:00, 20.47sample/s]
```

```
Test Accuracy: 0.496098104793757
Precision: 0.2461133295799575, Recall: 0.496098104793757, F1-score: 0.32900693984086
715
Accuracy of cats : 100 %
Accuracy of dogs : 0 %
```

```
Class_name: cats
```

```
Train_count: 900
```

```
Test_count: 300
```

```
Valid_count: 300
```

```
Shutil images: 100%|██████████| 150
0/1500 [00:00<00:00, 1890.85image/s]
```

```
Class_name: dogs
```

```
Train_count: 900
```

```
Test_count: 300
```

```
Valid_count: 300
```

```
Shutil images: 100%|██████████| 150
0/1500 [00:00<00:00, 1828.52image/s]
```

---

```
Выбранная модель: mnasnet1_0
```

```
Пользовательское название модели: mnasnet1_0_Exp2
```

```
Выбранный оптимизатор: AdamW
```

---

```
Epoch 1/10 (Train): 100%|██████████| 1
17/117 [00:10<00:00, 10.77sample/s]
Epoch 1/10 (Eval): 100%|██████████| 1
71/71 [00:03<00:00, 23.04sample/s]
```

```
Epoch 1/10, Training Loss: 0.7366407425542877, Validation Loss: 0.6931415112678614
Accuracy: 0.5033898305084745, Precision: 0.25340132145935074, Recall: 0.503389830508
4745, F1-score: 0.3371066057745591
```

```
Epoch 2/10 (Train): 100%|██████████| 1
17/117 [00:10<00:00, 10.76sample/s]
Epoch 2/10 (Eval): 100%|██████████| 1
71/71 [00:03<00:00, 23.01sample/s]
```

```
Epoch 2/10, Training Loss: 0.726024547086139, Validation Loss: 0.693135691227886
Accuracy: 0.5033898305084745, Precision: 0.25340132145935074, Recall: 0.503389830508
4745, F1-score: 0.3371066057745591
```

```
Epoch 3/10 (Train): 100%|██████████| 1
17/117 [00:10<00:00, 10.66sample/s]
Epoch 3/10 (Eval): 100%|██████████| 1
71/71 [00:03<00:00, 22.79sample/s]
```

```
Epoch 3/10, Training Loss: 0.6981689213067805, Validation Loss: 0.69314988134271
Accuracy: 0.5033898305084745, Precision: 0.25340132145935074, Recall: 0.503389830508
4745, F1-score: 0.3371066057745591
```

```
Epoch 4/10 (Train): 100%|██████████| 1
17/117 [00:10<00:00, 10.78sample/s]
Epoch 4/10 (Eval): 100%|██████████| 1
71/71 [00:03<00:00, 23.32sample/s]
```

Epoch 00004: reducing learning rate of group 0 to 1.0000e-04.

Epoch 4/10, Training Loss: 0.6755948097435469, Validation Loss: 0.693126154989846  
Accuracy: 0.5033898305084745, Precision: 0.25340132145935074, Recall: 0.5033898305084745, F1-score: 0.3371066057745591

Epoch 5/10 (Train): 100% | 1  
17/117 [00:10<00:00, 10.78sample/s]  
Epoch 5/10 (Eval): 100% |  
71/71 [00:03<00:00, 23.20sample/s]

Epoch 5/10, Training Loss: 0.6508962635424539, Validation Loss: 0.6931478364319451  
Accuracy: 0.5033898305084745, Precision: 0.25340132145935074, Recall: 0.5033898305084745, F1-score: 0.3371066057745591

Epoch 6/10 (Train): 100% | 1  
17/117 [00:10<00:00, 10.77sample/s]  
Epoch 6/10 (Eval): 100% |  
71/71 [00:03<00:00, 23.12sample/s]

Epoch 6/10, Training Loss: 0.6420721962689534, Validation Loss: 0.6931301698846332  
Accuracy: 0.5033898305084745, Precision: 0.25340132145935074, Recall: 0.5033898305084745, F1-score: 0.3371066057745591

Epoch 7/10 (Train): 100% | 1  
17/117 [00:10<00:00, 10.84sample/s]  
Epoch 7/10 (Eval): 100% |  
71/71 [00:03<00:00, 22.40sample/s]

Epoch 00007: reducing learning rate of group 0 to 1.0000e-05.

Epoch 7/10, Training Loss: 0.6372375625515312, Validation Loss: 0.6932251673970519  
Accuracy: 0.5033898305084745, Precision: 0.25340132145935074, Recall: 0.5033898305084745, F1-score: 0.3371066057745591

Epoch 8/10 (Train): 100% | 1  
17/117 [00:10<00:00, 10.70sample/s]  
Epoch 8/10 (Eval): 100% |  
71/71 [00:03<00:00, 23.31sample/s]

Epoch 8/10, Training Loss: 0.6179029407984612, Validation Loss: 0.6931614118107294  
Accuracy: 0.5033898305084745, Precision: 0.25340132145935074, Recall: 0.5033898305084745, F1-score: 0.3371066057745591

Epoch 9/10 (Train): 100% | 1  
17/117 [00:10<00:00, 10.80sample/s]  
Epoch 9/10 (Eval): 100% |  
71/71 [00:03<00:00, 23.15sample/s]

Epoch 9/10, Training Loss: 0.6230770162597964, Validation Loss: 0.693154837283711  
Accuracy: 0.5033898305084745, Precision: 0.25340132145935074, Recall: 0.5033898305084745, F1-score: 0.3371066057745591

Epoch 10/10 (Train): 100% | 1  
17/117 [00:10<00:00, 10.79sample/s]  
Epoch 10/10 (Eval): 100% |  
71/71 [00:03<00:00, 22.31sample/s]

Epoch 00010: reducing learning rate of group 0 to 1.0000e-06.

Epoch 10/10, Training Loss: 0.6088246873154264, Validation Loss: 0.6931323420866734  
Accuracy: 0.5033898305084745, Precision: 0.25340132145935074, Recall: 0.5033898305084745, F1-score: 0.3371066057745591

Тренировка завершена!

Test: 100% |  
72/72 [00:03<00:00, 19.82sample/s]

```
Test Accuracy: 0.496098104793757
Precision: 0.2461133295799575, Recall: 0.496098104793757, F1-score: 0.32900693984086
715
Accuracy of cats : 100 %
Accuracy of dogs : 0 %
```

```
Class_name: cats
```

```
Train_count: 900
```

```
Test_count: 300
```

```
Valid_count: 300
```

```
Shutil images: 100%|██████████| 150
0/1500 [00:00<00:00, 1870.59image/s]
```

```
Class_name: dogs
```

```
Train_count: 900
```

```
Test_count: 300
```

```
Valid_count: 300
```

```
Shutil images: 100%|██████████| 150
0/1500 [00:00<00:00, 1857.52image/s]
```

---

```
Выбранная модель: mnasnet1_3
```

```
Пользовательское название модели: mnasnet1_3_Exp2
```

```
Выбранный оптимизатор: AdamW
```

---

```
Epoch 1/10 (Train): 100%|██████████| 1
17/117 [00:11<00:00, 10.61sample/s]
```

```
Epoch 1/10 (Eval): 100%|██████████| 1
71/71 [00:03<00:00, 22.02sample/s]
```

```
Epoch 1/10, Training Loss: 0.7506316893084353, Validation Loss: 0.6931502313937171
Accuracy: 0.4966101694915254, Precision: 0.2466216604424016, Recall: 0.4966101694915
254, F1-score: 0.329573679866403
```

```
Epoch 2/10 (Train): 100%|██████████| 1
17/117 [00:10<00:00, 10.72sample/s]
```

```
Epoch 2/10 (Eval): 100%|██████████| 1
71/71 [00:03<00:00, 21.55sample/s]
```

```
Epoch 2/10, Training Loss: 0.6932572006564779, Validation Loss: 0.6931291074402588
Accuracy: 0.5033898305084745, Precision: 0.25340132145935074, Recall: 0.503389830508
4745, F1-score: 0.3371066057745591
```

```
Epoch 3/10 (Train): 100%|██████████| 1
17/117 [00:10<00:00, 10.70sample/s]
```

```
Epoch 3/10 (Eval): 100%|██████████| 1
71/71 [00:03<00:00, 21.97sample/s]
```

```
Epoch 3/10, Training Loss: 0.6863441612712297, Validation Loss: 0.6938791312066849
Accuracy: 0.5033898305084745, Precision: 0.25340132145935074, Recall: 0.503389830508
4745, F1-score: 0.3371066057745591
```

```
Epoch 4/10 (Train): 100%|██████████| 1
17/117 [00:10<00:00, 10.73sample/s]
```

```
Epoch 4/10 (Eval): 100%|██████████| 1
71/71 [00:03<00:00, 21.93sample/s]
```

Epoch 00004: reducing learning rate of group 0 to 1.0000e-04.

Epoch 4/10, Training Loss: 0.6626256482093195, Validation Loss: 0.6965127373482548  
Accuracy: 0.5033898305084745, Precision: 0.25340132145935074, Recall: 0.5033898305084745, F1-score: 0.3371066057745591

Epoch 5/10 (Train): 100% | 1  
17/117 [00:10<00:00, 10.69sample/s]  
Epoch 5/10 (Eval): 100% |  
71/71 [00:03<00:00, 21.69sample/s]

Epoch 5/10, Training Loss: 0.6345065617581823, Validation Loss: 0.6952318867384377  
Accuracy: 0.5033898305084745, Precision: 0.25340132145935074, Recall: 0.5033898305084745, F1-score: 0.3371066057745591

Epoch 6/10 (Train): 100% | 1  
17/117 [00:10<00:00, 10.66sample/s]  
Epoch 6/10 (Eval): 100% |  
71/71 [00:03<00:00, 21.22sample/s]

Epoch 6/10, Training Loss: 0.6206753893508944, Validation Loss: 0.6972145798516138  
Accuracy: 0.5033898305084745, Precision: 0.25340132145935074, Recall: 0.5033898305084745, F1-score: 0.3371066057745591

Epoch 7/10 (Train): 100% | 1  
17/117 [00:10<00:00, 10.64sample/s]  
Epoch 7/10 (Eval): 100% |  
71/71 [00:03<00:00, 22.10sample/s]

Epoch 00007: reducing learning rate of group 0 to 1.0000e-05.

Epoch 7/10, Training Loss: 0.6136506855795064, Validation Loss: 0.6952988629960745  
Accuracy: 0.5033898305084745, Precision: 0.25340132145935074, Recall: 0.5033898305084745, F1-score: 0.3371066057745591

Epoch 8/10 (Train): 100% | 1  
17/117 [00:10<00:00, 10.65sample/s]  
Epoch 8/10 (Eval): 100% |  
71/71 [00:03<00:00, 22.13sample/s]

Epoch 8/10, Training Loss: 0.5791401780655294, Validation Loss: 0.6951461385535656  
Accuracy: 0.5033898305084745, Precision: 0.25340132145935074, Recall: 0.5033898305084745, F1-score: 0.3371066057745591

Epoch 9/10 (Train): 100% | 1  
17/117 [00:10<00:00, 10.68sample/s]  
Epoch 9/10 (Eval): 100% |  
71/71 [00:03<00:00, 21.96sample/s]

Epoch 9/10, Training Loss: 0.593792302297153, Validation Loss: 0.6950678237750705  
Accuracy: 0.5033898305084745, Precision: 0.25340132145935074, Recall: 0.5033898305084745, F1-score: 0.3371066057745591

Epoch 10/10 (Train): 100% | 1  
17/117 [00:10<00:00, 10.72sample/s]  
Epoch 10/10 (Eval): 100% |  
71/71 [00:03<00:00, 22.45sample/s]

Epoch 00010: reducing learning rate of group 0 to 1.0000e-06.

Epoch 10/10, Training Loss: 0.5869673106985813, Validation Loss: 0.6950130462646484  
Accuracy: 0.5033898305084745, Precision: 0.25340132145935074, Recall: 0.5033898305084745, F1-score: 0.3371066057745591

Тренировка завершена!

Test: 100% |  
72/72 [00:03<00:00, 18.97sample/s]

```
Test Accuracy: 0.496098104793757
Precision: 0.2461133295799575, Recall: 0.496098104793757, F1-score: 0.32900693984086
715
Accuracy of cats : 100 %
Accuracy of dogs : 0 %
```

```
Class_name: cats
```

```
Train_count: 900
```

```
Test_count: 300
```

```
Valid_count: 300
```

```
Shutil images: 100%|██████████| 150
0/1500 [00:00<00:00, 1896.62image/s]
```

```
Class_name: dogs
```

```
Train_count: 900
```

```
Test_count: 300
```

```
Valid_count: 300
```

```
Shutil images: 100%|██████████| 150
0/1500 [00:00<00:00, 1793.88image/s]
```

---

```
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```

Выбранная модель: mobilenet\_v2

Пользовательское название модели: mobilenet\_v2\_Exp2

Выбранный оптимизатор: AdamW

```
-----
```

```
Epoch 1/10 (Train): 100%|██████████| 1
17/117 [00:11<00:00, 10.53sample/s]
Epoch 1/10 (Eval): 100%|██████████| 1
71/71 [00:03<00:00, 21.76sample/s]
```

```
Epoch 1/10, Training Loss: 0.7320565034433738, Validation Loss: 0.7304666081054062
Accuracy: 0.5050847457627119, Precision: 0.5594499632314475, Recall: 0.5050847457627
119, F1-score: 0.3457683720680318
```

```
Epoch 2/10 (Train): 100%|██████████| 1
17/117 [00:11<00:00, 10.61sample/s]
Epoch 2/10 (Eval): 100%|██████████| 1
71/71 [00:03<00:00, 22.25sample/s]
```

```
Epoch 2/10, Training Loss: 0.7092050028215978, Validation Loss: 0.6700667844990552
Accuracy: 0.5983050847457627, Precision: 0.6005635482220714, Recall: 0.598305084745
627, F1-score: 0.5953630492583575
```

```
Epoch 3/10 (Train): 100%|██████████| 1
17/117 [00:11<00:00, 10.54sample/s]
Epoch 3/10 (Eval): 100%|██████████| 1
71/71 [00:03<00:00, 22.16sample/s]
```

```
Epoch 3/10, Training Loss: 0.7075694610982416, Validation Loss: 0.6561177974030122
Accuracy: 0.6124293785310735, Precision: 0.6145186826014426, Recall: 0.6124293785310
735, F1-score: 0.6101309010269368
```

```
Epoch 4/10 (Train): 100%|██████████| 1
17/117 [00:11<00:00, 10.61sample/s]
Epoch 4/10 (Eval): 100%|██████████| 1
71/71 [00:03<00:00, 22.15sample/s]
```

Epoch 4/10, Training Loss: 0.6786547644236653, Validation Loss: 0.673161563900231  
Accuracy: 0.5858757062146893, Precision: 0.6478947307736653, Recall: 0.5858757062146893, F1-score: 0.5349675977536887

Epoch 5/10 (Train): 100% | ██████████ | 1  
17/117 [00:11<00:00, 10.62sample/s]

Epoch 5/10 (Eval): 100% | ██████████ |  
71/71 [00:03<00:00, 22.23sample/s]

Epoch 5/10, Training Loss: 0.6766962575953441, Validation Loss: 0.615597955924643  
Accuracy: 0.6570621468926554, Precision: 0.658571113754869, Recall: 0.6570621468926554, F1-score: 0.6559894620043772

Epoch 6/10 (Train): 100% | ██████████ | 1  
17/117 [00:11<00:00, 10.16sample/s]

Epoch 6/10 (Eval): 100% | ██████████ |  
71/71 [00:03<00:00, 21.47sample/s]

Epoch 6/10, Training Loss: 0.6737404671526447, Validation Loss: 0.6399109175818115  
Accuracy: 0.6220338983050847, Precision: 0.6837292378733965, Recall: 0.6220338983050847, F1-score: 0.5858022315043465

Epoch 7/10 (Train): 100% | ██████████ | 1  
17/117 [00:11<00:00, 10.08sample/s]

Epoch 7/10 (Eval): 100% | ██████████ |  
71/71 [00:03<00:00, 21.73sample/s]

Epoch 7/10, Training Loss: 0.6416863148769563, Validation Loss: 0.629316720585365  
Accuracy: 0.668361581920904, Precision: 0.6688278208851706, Recall: 0.668361581920904, F1-score: 0.668235684522708

Epoch 8/10 (Train): 100% | ██████████ | 1  
17/117 [00:11<00:00, 10.00sample/s]

Epoch 8/10 (Eval): 100% | ██████████ |  
71/71 [00:03<00:00, 21.73sample/s]

Epoch 00008: reducing learning rate of group 0 to 1.0000e-04.

Epoch 8/10, Training Loss: 0.654591704357121, Validation Loss: 0.6243270579199333  
Accuracy: 0.6389830508474577, Precision: 0.6987648092511762, Recall: 0.6389830508474577, F1-score: 0.6082931545825532

Epoch 9/10 (Train): 100% | ██████████ | 1  
17/117 [00:11<00:00, 9.88sample/s]

Epoch 9/10 (Eval): 100% | ██████████ |  
71/71 [00:03<00:00, 21.40sample/s]

Epoch 9/10, Training Loss: 0.6228910915527966, Validation Loss: 0.5710814615427438  
Accuracy: 0.7135593220338983, Precision: 0.7147122206822241, Recall: 0.7135593220338983, F1-score: 0.7132858285153121

Epoch 10/10 (Train): 100% | ██████████ | 1  
17/117 [00:11<00:00, 9.84sample/s]

Epoch 10/10 (Eval): 100% | ██████████ |  
71/71 [00:03<00:00, 21.64sample/s]

Epoch 10/10, Training Loss: 0.5996365385878947, Validation Loss: 0.5547128663224689  
Accuracy: 0.7129943502824859, Precision: 0.7130173321842382, Recall: 0.7129943502824859, F1-score: 0.7129976482882052

Тренировка завершена!

Test: 100% | ██████████ |  
72/72 [00:03<00:00, 19.03sample/s]

```
Test Accuracy: 0.717948717948718
Precision: 0.7181061773821955, Recall: 0.717948717948718, F1-score: 0.71793820149524
85
Accuracy of cats : 72 %
Accuracy of dogs : 70 %
```

```
Class_name: cats
```

```
Train_count: 900
```

```
Test_count: 300
```

```
Valid_count: 300
```

```
Shutil images: 100%|██████████| 150
0/1500 [00:00<00:00, 1797.69image/s]
```

```
Class_name: dogs
```

```
Train_count: 900
```

```
Test_count: 300
```

```
Valid_count: 300
```

```
Shutil images: 100%|██████████| 150
0/1500 [00:00<00:00, 1794.99image/s]
```

---

```
-----
```

Выбранная модель: mobilenet\_v3\_large

Пользовательское название модели: mobilenet\_v3\_large\_Exp2

Выбранный оптимизатор: AdamW

```
-----
```

```
Epoch 1/10 (Train): 100%|██████████| 1
17/117 [00:13<00:00, 8.93sample/s]
```

```
Epoch 1/10 (Eval): 100%|██████████| 1
71/71 [00:03<00:00, 21.61sample/s]
```

```
Epoch 1/10, Training Loss: 0.7190499406090307, Validation Loss: 0.6943383188234211
Accuracy: 0.4966101694915254, Precision: 0.2466216604424016, Recall: 0.4966101694915
254, F1-score: 0.329573679866403
```

```
Epoch 2/10 (Train): 100%|██████████| 1
17/117 [00:12<00:00, 9.11sample/s]
```

```
Epoch 2/10 (Eval): 100%|██████████| 1
71/71 [00:03<00:00, 22.00sample/s]
```

```
Epoch 2/10, Training Loss: 0.6932911173379708, Validation Loss: 0.6931287038460964
Accuracy: 0.5033898305084745, Precision: 0.25340132145935074, Recall: 0.503389830508
4745, F1-score: 0.3371066057745591
```

```
Epoch 3/10 (Train): 100%|██████████| 1
17/117 [00:12<00:00, 9.19sample/s]
```

```
Epoch 3/10 (Eval): 100%|██████████| 1
71/71 [00:03<00:00, 22.17sample/s]
```

```
Epoch 3/10, Training Loss: 0.6683997972724364, Validation Loss: 0.694543089401924
Accuracy: 0.4966101694915254, Precision: 0.2466216604424016, Recall: 0.4966101694915
254, F1-score: 0.329573679866403
```

```
Epoch 4/10 (Train): 100%|██████████| 1
17/117 [00:13<00:00, 9.00sample/s]
```

```
Epoch 4/10 (Eval): 100%|██████████| 1
71/71 [00:03<00:00, 22.23sample/s]
```

Epoch 4/10, Training Loss: 0.6613989525132163, Validation Loss: 0.6849443134614976  
Accuracy: 0.5333333333333333, Precision: 0.6351608751608752, Recall: 0.5333333333333333  
333, F1-score: 0.42045402496278483

Epoch 5/10 (Train): 100% | ██████████ | 1  
17/117 [00:12<00:00, 9.07sample/s]  
Epoch 5/10 (Eval): 100% | ██████████ |  
71/71 [00:03<00:00, 21.93sample/s]

Epoch 5/10, Training Loss: 0.6517814166357427, Validation Loss: 0.6487193904017324  
Accuracy: 0.6779661016949152, Precision: 0.6837376509031001, Recall: 0.6779661016949  
152, F1-score: 0.675040355125101

Epoch 6/10 (Train): 100% | ██████████ | 1  
17/117 [00:12<00:00, 9.12sample/s]  
Epoch 6/10 (Eval): 100% | ██████████ |  
71/71 [00:03<00:00, 22.35sample/s]

Epoch 6/10, Training Loss: 0.6401211997282874, Validation Loss: 0.6325412417872477  
Accuracy: 0.6457627118644068, Precision: 0.6483889472791758, Recall: 0.6457627118644  
068, F1-score: 0.6438147162408051

Epoch 7/10 (Train): 100% | ██████████ | 1  
17/117 [00:12<00:00, 9.12sample/s]  
Epoch 7/10 (Eval): 100% | ██████████ |  
71/71 [00:03<00:00, 22.38sample/s]

Epoch 7/10, Training Loss: 0.6422479624805582, Validation Loss: 0.6435029292005604  
Accuracy: 0.6293785310734463, Precision: 0.6515351443118753, Recall: 0.6293785310734  
463, F1-score: 0.6163856834051549

Epoch 8/10 (Train): 100% | ██████████ | 1  
17/117 [00:12<00:00, 9.10sample/s]  
Epoch 8/10 (Eval): 100% | ██████████ |  
71/71 [00:03<00:00, 21.75sample/s]

Epoch 8/10, Training Loss: 0.6398953695579902, Validation Loss: 0.7307008257356741  
Accuracy: 0.6361581920903955, Precision: 0.6388625247615881, Recall: 0.6361581920903  
955, F1-score: 0.6347522761795419

Epoch 9/10 (Train): 100% | ██████████ | 1  
17/117 [00:12<00:00, 9.01sample/s]  
Epoch 9/10 (Eval): 100% | ██████████ |  
71/71 [00:03<00:00, 22.09sample/s]

Epoch 00009: reducing learning rate of group 0 to 1.0000e-04.

Epoch 9/10, Training Loss: 0.6284788994957081, Validation Loss: 0.6674206380621862  
Accuracy: 0.6259887005649718, Precision: 0.6575065439901941, Recall: 0.6259887005649  
718, F1-score: 0.6075484160438481

Epoch 10/10 (Train): 100% | ██████████ | 1  
17/117 [00:12<00:00, 9.14sample/s]  
Epoch 10/10 (Eval): 100% | ██████████ |  
71/71 [00:03<00:00, 21.43sample/s]

Epoch 10/10, Training Loss: 0.6041308361844918, Validation Loss: 0.5654026834809848  
Accuracy: 0.7067796610169491, Precision: 0.7070670293360645, Recall: 0.7067796610169  
491, F1-score: 0.7067335149659015

Тренировка завершена!

Test: 100% | ██████████ |  
72/72 [00:03<00:00, 19.32sample/s]

```
Test Accuracy: 0.7146042363433668
Precision: 0.7147440351837924, Recall: 0.7146042363433668, F1-score: 0.7144998970081
594
Accuracy of cats : 69 %
Accuracy of dogs : 73 %
```

```
Class_name: cats
Train_count: 900
Test_count: 300
Valid_count: 300
```

```
Shutil images: 100%|██████████| 150
0/1500 [00:00<00:00, 1850.94image/s]
```

```
Class_name: dogs
Train_count: 900
Test_count: 300
Valid_count: 300
```

```
Shutil images: 100%|██████████| 150
0/1500 [00:00<00:00, 1880.42image/s]
```

---

```
-----  
Выбранная модель: mobilenet_v3_small  
Пользовательское название модели: mobilenet_v3_small_Exp2  
Выбранный оптимизатор: AdamW
```

---

```
Epoch 1/10 (Train): 100%|██████████| 1
17/117 [00:11<00:00, 10.12sample/s]
Epoch 1/10 (Eval): 100%|██████████| 1
71/71 [00:03<00:00, 22.59sample/s]
```

```
Epoch 1/10, Training Loss: 0.704105965460289, Validation Loss: 0.693124308929605
Accuracy: 0.5033898305084745, Precision: 0.25340132145935074, Recall: 0.503389830508
4745, F1-score: 0.3371066057745591
```

```
Epoch 2/10 (Train): 100%|██████████| 1
17/117 [00:11<00:00, 10.36sample/s]
Epoch 2/10 (Eval): 100%|██████████| 1
71/71 [00:03<00:00, 23.00sample/s]
```

```
Epoch 2/10, Training Loss: 0.6744349358212907, Validation Loss: 0.6939512055135716
Accuracy: 0.5033898305084745, Precision: 0.25340132145935074, Recall: 0.503389830508
4745, F1-score: 0.3371066057745591
```

```
Epoch 3/10 (Train): 100%|██████████| 1
17/117 [00:11<00:00, 10.26sample/s]
Epoch 3/10 (Eval): 100%|██████████| 1
71/71 [00:03<00:00, 22.87sample/s]
```

```
Epoch 3/10, Training Loss: 0.6626920186469645, Validation Loss: 0.6925999682165135
Accuracy: 0.5033898305084745, Precision: 0.25340132145935074, Recall: 0.503389830508
4745, F1-score: 0.3371066057745591
```

```
Epoch 4/10 (Train): 100%|██████████| 1
17/117 [00:11<00:00, 10.16sample/s]
Epoch 4/10 (Eval): 100%|██████████| 1
71/71 [00:03<00:00, 22.90sample/s]
```

Epoch 4/10, Training Loss: 0.6463404376174986, Validation Loss: 0.6841479608904844  
Accuracy: 0.6141242937853107, Precision: 0.6952387650327027, Recall: 0.6141242937853107, F1-score: 0.5711385699532228

Epoch 5/10 (Train): 100% | ██████████ | 1  
17/117 [00:11<00:00, 10.11sample/s]

Epoch 5/10 (Eval): 100% | ██████████ |  
71/71 [00:03<00:00, 22.83sample/s]

Epoch 5/10, Training Loss: 0.642765417592632, Validation Loss: 0.6256456802793815  
Accuracy: 0.672316384180791, Precision: 0.6730105598570438, Recall: 0.672316384180791, F1-score: 0.6718356650875762

Epoch 6/10 (Train): 100% | ██████████ | 1  
17/117 [00:11<00:00, 10.09sample/s]

Epoch 6/10 (Eval): 100% | ██████████ |  
71/71 [00:03<00:00, 23.01sample/s]

Epoch 6/10, Training Loss: 0.6318174627740768, Validation Loss: 0.6262328924432312  
Accuracy: 0.6644067796610169, Precision: 0.6651064133267497, Recall: 0.6644067796610169, F1-score: 0.6638847903111451

Epoch 7/10 (Train): 100% | ██████████ | 1  
17/117 [00:11<00:00, 10.20sample/s]

Epoch 7/10 (Eval): 100% | ██████████ |  
71/71 [00:03<00:00, 23.06sample/s]

Epoch 7/10, Training Loss: 0.6435620805754285, Validation Loss: 0.5584930235383201  
Accuracy: 0.7225988700564971, Precision: 0.7237400651178504, Recall: 0.7225988700564971, F1-score: 0.7221292684207605

Epoch 8/10 (Train): 100% | ██████████ | 1  
17/117 [00:11<00:00, 10.21sample/s]

Epoch 8/10 (Eval): 100% | ██████████ |  
71/71 [00:03<00:00, 22.80sample/s]

Epoch 8/10, Training Loss: 0.6180529479206223, Validation Loss: 0.5614878083184615  
Accuracy: 0.7141242937853107, Precision: 0.7172285278248965, Recall: 0.7141242937853107, F1-score: 0.7132844515608321

Epoch 9/10 (Train): 100% | ██████████ | 1  
17/117 [00:11<00:00, 10.13sample/s]

Epoch 9/10 (Eval): 100% | ██████████ |  
71/71 [00:03<00:00, 22.86sample/s]

Epoch 9/10, Training Loss: 0.5993333897230142, Validation Loss: 0.5347648379998019  
Accuracy: 0.7435028248587571, Precision: 0.7498356025093831, Recall: 0.7435028248587571, F1-score: 0.7420719815667721

Epoch 10/10 (Train): 100% | ██████████ | 1  
17/117 [00:11<00:00, 10.06sample/s]

Epoch 10/10 (Eval): 100% | ██████████ |  
71/71 [00:03<00:00, 22.79sample/s]

Epoch 10/10, Training Loss: 0.608772621685287, Validation Loss: 0.5770439675635537  
Accuracy: 0.7299435028248588, Precision: 0.732161451019785, Recall: 0.7299435028248588, F1-score: 0.7291495486791792

Тренировка завершена!

Test: 100% | ██████████ |  
72/72 [00:03<00:00, 21.05sample/s]

```
Test Accuracy: 0.7251950947603122
Precision: 0.7307314216180725, Recall: 0.7251950947603122, F1-score: 0.7237939632499
97
Accuracy of cats : 79 %
Accuracy of dogs : 65 %
```

```
Class_name: cats
```

```
Train_count: 900
```

```
Test_count: 300
```

```
Valid_count: 300
```

```
Shutil images: 100%|██████████| 150
0/1500 [00:00<00:00, 1890.74image/s]
```

```
Class_name: dogs
```

```
Train_count: 900
```

```
Test_count: 300
```

```
Valid_count: 300
```

```
Shutil images: 100%|██████████| 150
0/1500 [00:00<00:00, 1884.36image/s]
```

---

```
-----
```

Выбранная модель: regnet\_x\_16gf

Пользовательское название модели: regnet\_x\_16gf\_Exp2

Выбранный оптимизатор: SGD

```
-----
```

```
Epoch 1/10 (Train): 100%|██████████| 1
17/117 [00:15<00:00, 7.73sample/s]
Epoch 1/10 (Eval): 100%|██████████| 1
71/71 [00:04<00:00, 16.94sample/s]
```

```
Epoch 1/10, Training Loss: 0.7023256961832341, Validation Loss: 0.7073335332722314
Accuracy: 0.5135593220338983, Precision: 0.5145818292641208, Recall: 0.5135593220338
983, F1-score: 0.510095184726317
```

```
Epoch 2/10 (Train): 100%|██████████| 1
17/117 [00:15<00:00, 7.75sample/s]
Epoch 2/10 (Eval): 100%|██████████| 1
71/71 [00:04<00:00, 16.85sample/s]
```

```
Epoch 2/10, Training Loss: 0.7056206407415908, Validation Loss: 0.6992385709016337
Accuracy: 0.5163841807909605, Precision: 0.522478823385406, Recall: 0.51638418079096
05, F1-score: 0.4678540916159767
```

```
Epoch 3/10 (Train): 100%|██████████| 1
17/117 [00:15<00:00, 7.73sample/s]
Epoch 3/10 (Eval): 100%|██████████| 1
71/71 [00:04<00:00, 16.66sample/s]
```

```
Epoch 3/10, Training Loss: 0.7060567594270936, Validation Loss: 0.7156341597016922
Accuracy: 0.4966101694915254, Precision: 0.4839803171131766, Recall: 0.4966101694915
254, F1-score: 0.40330580090713775
```

```
Epoch 4/10 (Train): 100%|██████████| 1
17/117 [00:15<00:00, 7.66sample/s]
Epoch 4/10 (Eval): 100%|██████████| 1
71/71 [00:04<00:00, 15.97sample/s]
```

```
Epoch 4/10, Training Loss: 0.6988448973783513, Validation Loss: 0.6978790418239637
Accuracy: 0.5220338983050847, Precision: 0.5233536435847111, Recall: 0.5220338983050
847, F1-score: 0.5184904548261691

Epoch 5/10 (Train): 100%|██████████| 1
17/117 [00:15<00:00, 7.72sample/s]
Epoch 5/10 (Eval): 100%|██████████| 1
71/71 [00:04<00:00, 16.78sample/s]

Epoch 5/10, Training Loss: 0.7055629526626613, Validation Loss: 0.7094566980324223
Accuracy: 0.507909604519774, Precision: 0.5094838797447161, Recall: 0.50790960451977
4, F1-score: 0.45456009989043517

Epoch 6/10 (Train): 100%|██████████| 1
17/117 [00:15<00:00, 7.68sample/s]
Epoch 6/10 (Eval): 100%|██████████| 1
71/71 [00:04<00:00, 16.67sample/s]

Epoch 6/10, Training Loss: 0.6998572040259633, Validation Loss: 0.7222503762123949
Accuracy: 0.49887005649717514, Precision: 0.5150753601550866, Recall: 0.498870056497
17514, F1-score: 0.36120059577648445

Epoch 7/10 (Train): 100%|██████████| 1
17/117 [00:15<00:00, 7.69sample/s]
Epoch 7/10 (Eval): 100%|██████████| 1
71/71 [00:04<00:00, 16.55sample/s]

Epoch 00007: reducing learning rate of group 0 to 1.0000e-04.

Epoch 7/10, Training Loss: 0.6959600988327432, Validation Loss: 0.7052689366421457
Accuracy: 0.5135593220338983, Precision: 0.5320016491534059, Recall: 0.5135593220338
983, F1-score: 0.44446244485169967

Epoch 8/10 (Train): 100%|██████████| 1
17/117 [00:15<00:00, 7.66sample/s]
Epoch 8/10 (Eval): 100%|██████████| 1
71/71 [00:04<00:00, 16.66sample/s]

Epoch 8/10, Training Loss: 0.6965336968603822, Validation Loss: 0.690109451443462
Accuracy: 0.5327683615819209, Precision: 0.5328955737643583, Recall: 0.5327683615819
209, F1-score: 0.5327079567159327

Epoch 9/10 (Train): 100%|██████████| 1
17/117 [00:15<00:00, 7.68sample/s]
Epoch 9/10 (Eval): 100%|██████████| 1
71/71 [00:04<00:00, 16.61sample/s]

Epoch 9/10, Training Loss: 0.6909017374425409, Validation Loss: 0.6927538734708129
Accuracy: 0.5316384180790961, Precision: 0.5330104110369479, Recall: 0.5316384180790
961, F1-score: 0.5288224513007093

Epoch 10/10 (Train): 100%|██████████| 1
17/117 [00:15<00:00, 7.68sample/s]
Epoch 10/10 (Eval): 100%|██████████| 1
71/71 [00:04<00:00, 16.51sample/s]

Epoch 10/10, Training Loss: 0.6945722864051045, Validation Loss: 0.6900677529432006
Accuracy: 0.5220338983050847, Precision: 0.5236375661396485, Recall: 0.5220338983050
847, F1-score: 0.5174859505180178

Тренировка завершена!

Test: 100%|██████████| 1
72/72 [00:04<00:00, 16.01sample/s]
```

```
Test Accuracy: 0.5178372352285395
Precision: 0.5177156893941157, Recall: 0.5178372352285395, F1-score: 0.5138777529218
07
Accuracy of cats : 42 %
Accuracy of dogs : 60 %
```

```
Class_name: cats
```

```
Train_count: 900
```

```
Test_count: 300
```

```
Valid_count: 300
```

```
Shutil images: 100%|██████████| 150
0/1500 [00:00<00:00, 1793.77image/s]
```

```
Class_name: dogs
```

```
Train_count: 900
```

```
Test_count: 300
```

```
Valid_count: 300
```

```
Shutil images: 100%|██████████| 150
0/1500 [00:00<00:00, 1825.15image/s]
```

---

```
-----
```

Выбранная модель: regnet\_x\_1\_6gf

Пользовательское название модели: regnet\_x\_1\_6gf\_Exp2

Выбранный оптимизатор: SGD

```
-----
```

```
Epoch 1/10 (Train): 100%|██████████| 1
17/117 [00:11<00:00, 10.09sample/s]
Epoch 1/10 (Eval): 100%|██████████| 1
71/71 [00:03<00:00, 19.96sample/s]
```

```
Epoch 1/10, Training Loss: 0.7127156090695423, Validation Loss: 0.7182709281727419
Accuracy: 0.4971751412429379, Precision: 0.4930499895045118, Recall: 0.4971751412429
379, F1-score: 0.45310453199381917
```

```
Epoch 2/10 (Train): 100%|██████████| 1
17/117 [00:11<00:00, 10.17sample/s]
Epoch 2/10 (Eval): 100%|██████████| 1
71/71 [00:03<00:00, 19.99sample/s]
```

```
Epoch 2/10, Training Loss: 0.7047429297797868, Validation Loss: 0.7142270795032803
Accuracy: 0.511864406779661, Precision: 0.5151911383345015, Recall: 0.51186440677966
1, F1-score: 0.46448065025535096
```

```
Epoch 3/10 (Train): 100%|██████████| 1
17/117 [00:11<00:00, 9.92sample/s]
Epoch 3/10 (Eval): 100%|██████████| 1
71/71 [00:03<00:00, 19.91sample/s]
```

```
Epoch 3/10, Training Loss: 0.7045325694215256, Validation Loss: 0.7000945510163818
Accuracy: 0.535593220338983, Precision: 0.5375471093235968, Recall: 0.53559322033898
3, F1-score: 0.5262899010894356
```

```
Epoch 4/10 (Train): 100%|██████████| 1
17/117 [00:11<00:00, 10.26sample/s]
Epoch 4/10 (Eval): 100%|██████████| 1
71/71 [00:03<00:00, 20.04sample/s]
```

Epoch 4/10, Training Loss: 0.7069449498481357, Validation Loss: 0.7053260887410008  
Accuracy: 0.4966101694915254, Precision: 0.4961701015206309, Recall: 0.4966101694915  
254, F1-score: 0.4947688403500268

Epoch 5/10 (Train): 100% | ██████████ | 1  
17/117 [00:11<00:00, 10.17sample/s]  
Epoch 5/10 (Eval): 100% | ██████████ |  
71/71 [00:03<00:00, 20.36sample/s]

Epoch 5/10, Training Loss: 0.7085331852493417, Validation Loss: 0.7148744898327326  
Accuracy: 0.5192090395480226, Precision: 0.531763531408887, Recall: 0.51920903954802  
26, F1-score: 0.47596209223290464

Epoch 6/10 (Train): 100% | ██████████ | 1  
17/117 [00:11<00:00, 10.28sample/s]  
Epoch 6/10 (Eval): 100% | ██████████ |  
71/71 [00:03<00:00, 20.18sample/s]

Epoch 6/10, Training Loss: 0.7057408729369697, Validation Loss: 0.6992738881690354  
Accuracy: 0.5305084745762711, Precision: 0.5375686419592623, Recall: 0.5305084745762  
711, F1-score: 0.5122202157601092

Epoch 7/10 (Train): 100% | ██████████ | 1  
17/117 [00:11<00:00, 10.39sample/s]  
Epoch 7/10 (Eval): 100% | ██████████ |  
71/71 [00:03<00:00, 20.24sample/s]

Epoch 7/10, Training Loss: 0.7044680329532558, Validation Loss: 0.6951388858132443  
Accuracy: 0.5265536723163842, Precision: 0.5267163415732933, Recall: 0.5265536723163  
842, F1-score: 0.5264406164984127

Epoch 8/10 (Train): 100% | ██████████ | 1  
17/117 [00:11<00:00, 10.31sample/s]  
Epoch 8/10 (Eval): 100% | ██████████ |  
71/71 [00:03<00:00, 20.71sample/s]

Epoch 8/10, Training Loss: 0.7051480981902158, Validation Loss: 0.7099774335063783  
Accuracy: 0.5163841807909605, Precision: 0.5301257787224839, Recall: 0.5163841807909  
605, F1-score: 0.4652368053914517

Epoch 9/10 (Train): 100% | ██████████ | 1  
17/117 [00:11<00:00, 10.29sample/s]  
Epoch 9/10 (Eval): 100% | ██████████ |  
71/71 [00:03<00:00, 19.84sample/s]

Epoch 9/10, Training Loss: 0.7027015650190439, Validation Loss: 0.7000994754713133  
Accuracy: 0.5265536723163842, Precision: 0.5391899443934899, Recall: 0.5265536723163  
842, F1-score: 0.47705792317789425

Epoch 10/10 (Train): 100% | ██████████ | 1  
17/117 [00:11<00:00, 10.43sample/s]  
Epoch 10/10 (Eval): 100% | ██████████ |  
71/71 [00:03<00:00, 20.26sample/s]

Epoch 10/10, Training Loss: 0.700655660268777, Validation Loss: 0.6910429773694378  
Accuracy: 0.5282485875706214, Precision: 0.5293091041116862, Recall: 0.5282485875706  
214, F1-score: 0.5260400468160457

Тренировка завершена!

Test: 100% | ██████████ |  
72/72 [00:04<00:00, 17.69sample/s]

```
Test Accuracy: 0.5178372352285395
Precision: 0.5176504397059662, Recall: 0.5178372352285395, F1-score: 0.5153761072708
699
Accuracy of cats : 44 %
Accuracy of dogs : 58 %
```

```
Class_name: cats
```

```
Train_count: 900
```

```
Test_count: 300
```

```
Valid_count: 300
```

```
Shutil images: 100%|██████████| 150
0/1500 [00:00<00:00, 1850.24image/s]
```

```
Class_name: dogs
```

```
Train_count: 900
```

```
Test_count: 300
```

```
Valid_count: 300
```

```
Shutil images: 100%|██████████| 150
0/1500 [00:00<00:00, 1836.67image/s]
```

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```
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```

Выбранная модель: regnet\_x\_3\_2gf

Пользовательское название модели: regnet\_x\_3\_2gf\_Exp2

Выбранный оптимизатор: SGD

```
-----
```

```
Epoch 1/10 (Train): 100%|██████████| 1
17/117 [00:13<00:00, 8.42sample/s]
Epoch 1/10 (Eval): 100%|██████████| 1
71/71 [00:03<00:00, 17.81sample/s]
```

```
Epoch 1/10, Training Loss: 0.7118202348550161, Validation Loss: 0.7270920146993325
Accuracy: 0.4830508474576271, Precision: 0.4812839028378252, Recall: 0.4830508474576
271, F1-score: 0.47588261365923074
```

```
Epoch 2/10 (Train): 100%|██████████| 1
17/117 [00:13<00:00, 8.58sample/s]
Epoch 2/10 (Eval): 100%|██████████| 1
71/71 [00:03<00:00, 17.97sample/s]
```

```
Epoch 2/10, Training Loss: 0.7113351904854333, Validation Loss: 0.7124414614028176
Accuracy: 0.5, Precision: 0.5043935762224353, Recall: 0.5, F1-score: 0.4340346180868
094
```

```
Epoch 3/10 (Train): 100%|██████████| 1
17/117 [00:13<00:00, 8.49sample/s]
Epoch 3/10 (Eval): 100%|██████████| 1
71/71 [00:04<00:00, 17.75sample/s]
```

```
Epoch 3/10, Training Loss: 0.7115627718750144, Validation Loss: 0.7431181228093509
Accuracy: 0.5242937853107345, Precision: 0.5304421764873571, Recall: 0.5242937853107
345, F1-score: 0.49105155605347556
```

```
Epoch 4/10 (Train): 100%|██████████| 1
17/117 [00:13<00:00, 8.57sample/s]
Epoch 4/10 (Eval): 100%|██████████| 1
71/71 [00:04<00:00, 17.55sample/s]
```

Epoch 4/10, Training Loss: 0.7051988367977011, Validation Loss: 0.7151026538873123  
Accuracy: 0.5169491525423728, Precision: 0.5407437185275362, Recall: 0.5169491525423  
728, F1-score: 0.44476497084694844

Epoch 5/10 (Train): 100% | ██████████ | 1  
17/117 [00:13<00:00, 8.54sample/s]  
Epoch 5/10 (Eval): 100% | ██████████ |  
71/71 [00:04<00:00, 17.74sample/s]

Epoch 5/10, Training Loss: 0.7073403896949545, Validation Loss: 0.6962487344014443  
Accuracy: 0.5440677966101695, Precision: 0.5462939182831801, Recall: 0.5440677966101  
695, F1-score: 0.5402716307673017

Epoch 6/10 (Train): 100% | ██████████ | 1  
17/117 [00:13<00:00, 8.49sample/s]  
Epoch 6/10 (Eval): 100% | ██████████ |  
71/71 [00:03<00:00, 17.92sample/s]

Epoch 6/10, Training Loss: 0.7064626798596988, Validation Loss: 0.695101467650489  
Accuracy: 0.5271186440677966, Precision: 0.5392123080208023, Recall: 0.5271186440677  
966, F1-score: 0.4798612699468191

Epoch 7/10 (Train): 100% | ██████████ | 1  
17/117 [00:13<00:00, 8.58sample/s]  
Epoch 7/10 (Eval): 100% | ██████████ |  
71/71 [00:03<00:00, 18.03sample/s]

Epoch 7/10, Training Loss: 0.7118707336101335, Validation Loss: 0.6925012644401378  
Accuracy: 0.519774011299435, Precision: 0.5196810232651962, Recall: 0.51977401129943  
5, F1-score: 0.5175610138692918

Epoch 8/10 (Train): 100% | ██████████ | 1  
17/117 [00:13<00:00, 8.51sample/s]  
Epoch 8/10 (Eval): 100% | ██████████ |  
71/71 [00:04<00:00, 17.56sample/s]

Epoch 8/10, Training Loss: 0.699365998871138, Validation Loss: 0.6945168271576617  
Accuracy: 0.511864406779661, Precision: 0.5119996969486353, Recall: 0.51186440677966  
1, F1-score: 0.5117646759641268

Epoch 9/10 (Train): 100% | ██████████ | 1  
17/117 [00:13<00:00, 8.55sample/s]  
Epoch 9/10 (Eval): 100% | ██████████ |  
71/71 [00:03<00:00, 18.04sample/s]

Epoch 9/10, Training Loss: 0.703993490471463, Validation Loss: 0.6968789282491652  
Accuracy: 0.5276836158192091, Precision: 0.5482967570699032, Recall: 0.527683615819  
091, F1-score: 0.47813303411484476

Epoch 10/10 (Train): 100% | ██████████ | 1  
17/117 [00:13<00:00, 8.62sample/s]  
Epoch 10/10 (Eval): 100% | ██████████ |  
71/71 [00:03<00:00, 18.14sample/s]

Epoch 00010: reducing learning rate of group 0 to 1.0000e-04.

Epoch 10/10, Training Loss: 0.6985836410030877, Validation Loss: 0.7046348343124498  
Accuracy: 0.5322033898305085, Precision: 0.5653276685811974, Recall: 0.5322033898305  
085, F1-score: 0.47025564009043946

Тренировка завершена!

Test: 100% | ██████████ |  
72/72 [00:04<00:00, 16.55sample/s]

```
Test Accuracy: 0.5278706800445931
Precision: 0.5462083223592924, Recall: 0.5278706800445931, F1-score: 0.4668857850124
0463
Accuracy of cats : 18 %
Accuracy of dogs : 86 %
```

```
Class_name: cats
```

```
Train_count: 900
```

```
Test_count: 300
```

```
Valid_count: 300
```

```
Shutil images: 100%|██████████| 150
0/1500 [00:00<00:00, 1882.28image/s]
```

```
Class_name: dogs
```

```
Train_count: 900
```

```
Test_count: 300
```

```
Valid_count: 300
```

```
Shutil images: 100%|██████████| 150
0/1500 [00:00<00:00, 1865.49image/s]
```

---

```
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```

Выбранная модель: regnet\_x\_400mf

Пользовательское название модели: regnet\_x\_400mf\_Exp2

Выбранный оптимизатор: SGD

```
-----
```

```
Epoch 1/10 (Train): 100%|██████████| 1
17/117 [00:11<00:00, 10.18sample/s]
Epoch 1/10 (Eval): 100%|██████████| 1
71/71 [00:03<00:00, 19.70sample/s]
```

```
Epoch 1/10, Training Loss: 0.7885890664513578, Validation Loss: 0.7953020702984374
Accuracy: 0.5, Precision: 0.5043539807824297, Recall: 0.5, F1-score: 0.4345265300697
8953
```

```
Epoch 2/10 (Train): 100%|██████████| 1
17/117 [00:11<00:00, 10.14sample/s]
Epoch 2/10 (Eval): 100%|██████████| 1
71/71 [00:03<00:00, 19.85sample/s]
```

```
Epoch 2/10, Training Loss: 0.7756611257279452, Validation Loss: 0.7525678002564921
Accuracy: 0.480225988700565, Precision: 0.4801745502856943, Recall: 0.48022598870056
5, F1-score: 0.48017819833301223
```

```
Epoch 3/10 (Train): 100%|██████████| 1
17/117 [00:11<00:00, 10.21sample/s]
Epoch 3/10 (Eval): 100%|██████████| 1
71/71 [00:03<00:00, 19.62sample/s]
```

```
Epoch 3/10, Training Loss: 0.7552186042787283, Validation Loss: 0.7398586864188567
Accuracy: 0.4943502824858757, Precision: 0.4932949828672432, Recall: 0.494350282485
757, F1-score: 0.4880089125051192
```

```
Epoch 4/10 (Train): 100%|██████████| 1
17/117 [00:11<00:00, 10.19sample/s]
Epoch 4/10 (Eval): 100%|██████████| 1
71/71 [00:03<00:00, 19.80sample/s]
```

Epoch 4/10, Training Loss: 0.7464792869754673, Validation Loss: 0.7273511630667131  
Accuracy: 0.5327683615819209, Precision: 0.5333159606713145, Recall: 0.5327683615819  
209, F1-score: 0.5319778461853996

Epoch 5/10 (Train): 100% | [██████████] | 1  
17/117 [00:11<00:00, 10.25sample/s]

Epoch 5/10 (Eval): 100% | [██████████] |  
71/71 [00:03<00:00, 19.11sample/s]

Epoch 5/10, Training Loss: 0.7345299292675818, Validation Loss: 0.7882489936668321  
Accuracy: 0.507909604519774, Precision: 0.5203868143246224, Recall: 0.50790960451977  
4, F1-score: 0.43902579174725

Epoch 6/10 (Train): 100% | [██████████] | 1  
17/117 [00:11<00:00, 10.11sample/s]

Epoch 6/10 (Eval): 100% | [██████████] |  
71/71 [00:03<00:00, 19.23sample/s]

Epoch 6/10, Training Loss: 0.7440628179979488, Validation Loss: 0.7916535243476178  
Accuracy: 0.5022598870056497, Precision: 0.5065614876721032, Recall: 0.5022598870056  
497, F1-score: 0.45515233284863

Epoch 7/10 (Train): 100% | [██████████] | 1  
17/117 [00:11<00:00, 10.20sample/s]

Epoch 7/10 (Eval): 100% | [██████████] |  
71/71 [00:03<00:00, 19.60sample/s]

Epoch 00007: reducing learning rate of group 0 to 1.0000e-04.

Epoch 7/10, Training Loss: 0.7425132142923951, Validation Loss: 0.7682294630061435  
Accuracy: 0.5180790960451978, Precision: 0.5295652690647393, Recall: 0.5180790960451  
978, F1-score: 0.4761987239165505

Epoch 8/10 (Train): 100% | [██████████] | 1  
17/117 [00:11<00:00, 10.19sample/s]

Epoch 8/10 (Eval): 100% | [██████████] |  
71/71 [00:03<00:00, 19.83sample/s]

Epoch 8/10, Training Loss: 0.7118472288973963, Validation Loss: 0.7044635078327804  
Accuracy: 0.5338983050847458, Precision: 0.5342435959967358, Recall: 0.5338983050847  
458, F1-score: 0.5335164467073089

Epoch 9/10 (Train): 100% | [██████████] | 1  
17/117 [00:11<00:00, 10.19sample/s]

Epoch 9/10 (Eval): 100% | [██████████] |  
71/71 [00:03<00:00, 19.79sample/s]

Epoch 9/10, Training Loss: 0.7111799188495911, Validation Loss: 0.70281388640067  
Accuracy: 0.5209039548022599, Precision: 0.5210277209473299, Recall: 0.5209039548022  
599, F1-score: 0.5208354391878943

Epoch 10/10 (Train): 100% | [██████████] | 1  
17/117 [00:11<00:00, 10.04sample/s]

Epoch 10/10 (Eval): 100% | [██████████] |  
71/71 [00:03<00:00, 19.56sample/s]

Epoch 10/10, Training Loss: 0.7118063420569364, Validation Loss: 0.6998632723665507  
Accuracy: 0.5316384180790961, Precision: 0.5338128935192545, Recall: 0.5316384180790  
961, F1-score: 0.5266978074728921

Тренировка завершена!

Test: 100% | [██████████] |  
72/72 [00:03<00:00, 18.13sample/s]

```
Test Accuracy: 0.5317725752508361
Precision: 0.5322004226407953, Recall: 0.5317725752508361, F1-score: 0.5273813394168
704
Accuracy of cats : 43 %
Accuracy of dogs : 62 %
```

```
Class_name: cats
```

```
Train_count: 900
```

```
Test_count: 300
```

```
Valid_count: 300
```

```
Shutil images: 100%|██████████| 150
0/1500 [00:00<00:00, 1844.88image/s]
```

```
Class_name: dogs
```

```
Train_count: 900
```

```
Test_count: 300
```

```
Valid_count: 300
```

```
Shutil images: 100%|██████████| 150
0/1500 [00:00<00:00, 1830.73image/s]
```

---

```
Выбранная модель: regnet_x_800mf
```

```
Пользовательское название модели: regnet_x_800mf_Exp2
```

```
Выбранный оптимизатор: SGD
```

---

```
Epoch 1/10 (Train): 100%|██████████| 1
17/117 [00:10<00:00, 11.01sample/s]
```

```
Epoch 1/10 (Eval): 100%|██████████| 1
71/71 [00:03<00:00, 20.80sample/s]
```

```
Epoch 1/10, Training Loss: 0.7337097575779223, Validation Loss: 0.732370704580835
Accuracy: 0.49887005649717514, Precision: 0.4979504174045029, Recall: 0.498870056497
17514, F1-score: 0.49136478796617367
```

```
Epoch 2/10 (Train): 100%|██████████| 1
17/117 [00:10<00:00, 11.07sample/s]
```

```
Epoch 2/10 (Eval): 100%|██████████| 1
71/71 [00:03<00:00, 21.32sample/s]
```

```
Epoch 2/10, Training Loss: 0.7175005394773385, Validation Loss: 0.7126249899971957
Accuracy: 0.5175141242937853, Precision: 0.5182552236304541, Recall: 0.517514124293
853, F1-score: 0.5156497575424359
```

```
Epoch 3/10 (Train): 100%|██████████| 1
17/117 [00:10<00:00, 11.04sample/s]
```

```
Epoch 3/10 (Eval): 100%|██████████| 1
71/71 [00:03<00:00, 21.29sample/s]
```

```
Epoch 3/10, Training Loss: 0.7197993323975003, Validation Loss: 0.711775040559176
Accuracy: 0.523728813559322, Precision: 0.52396026207093, Recall: 0.523728813559322,
F1-score: 0.519244150786811
```

```
Epoch 4/10 (Train): 100%|██████████| 1
17/117 [00:10<00:00, 11.03sample/s]
```

```
Epoch 4/10 (Eval): 100%|██████████| 1
71/71 [00:03<00:00, 21.50sample/s]
```

Epoch 4/10, Training Loss: 0.7188544674837303, Validation Loss: 0.7056227243889523  
Accuracy: 0.5135593220338983, Precision: 0.5133921142565142, Recall: 0.5135593220338  
983, F1-score: 0.5095040974472053

Epoch 5/10 (Train): 100% | ██████████ | 1  
17/117 [00:10<00:00, 10.94sample/s]  
Epoch 5/10 (Eval): 100% | ██████████ |  
71/71 [00:03<00:00, 20.90sample/s]

Epoch 5/10, Training Loss: 0.7094313299533018, Validation Loss: 0.7133467227725659  
Accuracy: 0.5305084745762711, Precision: 0.5319145891884806, Recall: 0.5305084745762  
711, F1-score: 0.5275171321980026

Epoch 6/10 (Train): 100% | ██████████ | 1  
17/117 [00:10<00:00, 10.85sample/s]  
Epoch 6/10 (Eval): 100% | ██████████ |  
71/71 [00:03<00:00, 21.04sample/s]

Epoch 6/10, Training Loss: 0.7149866476296559, Validation Loss: 0.7399281596733351  
Accuracy: 0.511864406779661, Precision: 0.5304052479104925, Recall: 0.51186440677966  
1, F1-score: 0.4381310645903402

Epoch 7/10 (Train): 100% | ██████████ | 1  
17/117 [00:10<00:00, 11.19sample/s]  
Epoch 7/10 (Eval): 100% | ██████████ |  
71/71 [00:03<00:00, 20.90sample/s]

Epoch 00007: reducing learning rate of group 0 to 1.0000e-04.

Epoch 7/10, Training Loss: 0.720662558406489, Validation Loss: 0.7141305511280641  
Accuracy: 0.5254237288135594, Precision: 0.5259678987189932, Recall: 0.5254237288135  
594, F1-score: 0.5192867972389819

Epoch 8/10 (Train): 100% | ██████████ | 1  
17/117 [00:10<00:00, 10.80sample/s]  
Epoch 8/10 (Eval): 100% | ██████████ |  
71/71 [00:03<00:00, 20.92sample/s]

Epoch 8/10, Training Loss: 0.7035664775732047, Validation Loss: 0.7126088671091586  
Accuracy: 0.5141242937853108, Precision: 0.5155375985894326, Recall: 0.5141242937853  
108, F1-score: 0.4903566969497054

Epoch 9/10 (Train): 100% | ██████████ | 1  
17/117 [00:10<00:00, 10.79sample/s]  
Epoch 9/10 (Eval): 100% | ██████████ |  
71/71 [00:03<00:00, 21.12sample/s]

Epoch 9/10, Training Loss: 0.6999357018069303, Validation Loss: 0.711326749648078  
Accuracy: 0.4966101694915254, Precision: 0.4953875216455895, Recall: 0.4966101694915  
254, F1-score: 0.48725866366243176

Epoch 10/10 (Train): 100% | ██████████ | 1  
17/117 [00:10<00:00, 10.73sample/s]  
Epoch 10/10 (Eval): 100% | ██████████ |  
71/71 [00:03<00:00, 21.07sample/s]

Epoch 00010: reducing learning rate of group 0 to 1.0000e-05.

Epoch 10/10, Training Loss: 0.7064648129276394, Validation Loss: 0.712728749560771  
Accuracy: 0.48983050847457626, Precision: 0.489335599815613, Recall: 0.4898305084745  
7626, F1-score: 0.4881691423722873

Тренировка завершена!

Test: 100% | ██████████ |  
72/72 [00:03<00:00, 19.06sample/s]

```
Test Accuracy: 0.5100334448160535
Precision: 0.5106398535775095, Recall: 0.5100334448160535, F1-score: 0.5085144477017
168
Accuracy of cats : 56 %
Accuracy of dogs : 45 %
```

```
Class_name: cats
```

```
Train_count: 900
```

```
Test_count: 300
```

```
Valid_count: 300
```

```
Shutil images: 100%|██████████| 150
0/1500 [00:00<00:00, 1884.03image/s]
```

```
Class_name: dogs
```

```
Train_count: 900
```

```
Test_count: 300
```

```
Valid_count: 300
```

```
Shutil images: 100%|██████████| 150
0/1500 [00:00<00:00, 1704.59image/s]
```

---

```
Выбранная модель: regnet_y_16gf
```

```
Пользовательское название модели: regnet_y_16gf_Exp2
```

```
Выбранный оптимизатор: SGD
```

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```
Epoch 1/10 (Train): 100%|██████████| 1
17/117 [00:17<00:00, 6.77sample/s]
Epoch 1/10 (Eval): 100%|██████████| 1
71/71 [00:04<00:00, 14.97sample/s]
```

```
Epoch 1/10, Training Loss: 0.7064210875951957, Validation Loss: 0.7838898065399988
Accuracy: 0.49830508474576274, Precision: 0.5011240484940072, Recall: 0.498305084745
76274, F1-score: 0.433832785128583
```

```
Epoch 2/10 (Train): 100%|██████████| 1
17/117 [00:17<00:00, 6.87sample/s]
Epoch 2/10 (Eval): 100%|██████████| 1
71/71 [00:04<00:00, 14.99sample/s]
```

```
Epoch 2/10, Training Loss: 0.7215914947470439, Validation Loss: 0.7448525795828824
Accuracy: 0.5169491525423728, Precision: 0.5493638423773965, Recall: 0.5169491525423
728, F1-score: 0.41121843268905667
```

```
Epoch 3/10 (Train): 100%|██████████| 1
17/117 [00:17<00:00, 6.78sample/s]
Epoch 3/10 (Eval): 100%|██████████| 1
71/71 [00:04<00:00, 14.93sample/s]
```

```
Epoch 3/10, Training Loss: 0.7055773475940285, Validation Loss: 0.6947453151651695
Accuracy: 0.5033898305084745, Precision: 0.5027210261108566, Recall: 0.5033898305084
745, F1-score: 0.49523178741682783
```

```
Epoch 4/10 (Train): 100%|██████████| 1
17/117 [00:17<00:00, 6.83sample/s]
Epoch 4/10 (Eval): 100%|██████████| 1
71/71 [00:04<00:00, 14.92sample/s]
```

Epoch 4/10, Training Loss: 0.7040569608154166, Validation Loss: 0.7057688017349458  
Accuracy: 0.5220338983050847, Precision: 0.5240112647997343, Recall: 0.5220338983050  
847, F1-score: 0.5052345064271369

Epoch 5/10 (Train): 100% | [██████████] | 1  
17/117 [00:17<00:00, 6.79sample/s]

Epoch 5/10 (Eval): 100% | [██████████] |  
71/71 [00:04<00:00, 15.05sample/s]

Epoch 5/10, Training Loss: 0.7039866865295725, Validation Loss: 0.7454522716797004  
Accuracy: 0.5327683615819209, Precision: 0.5327081053614143, Recall: 0.5327683615819  
209, F1-score: 0.5326482592504445

Epoch 6/10 (Train): 100% | [██████████] | 1  
17/117 [00:17<00:00, 6.80sample/s]

Epoch 6/10 (Eval): 100% | [██████████] |  
71/71 [00:04<00:00, 15.04sample/s]

Epoch 00006: reducing learning rate of group 0 to 1.0000e-04.

Epoch 6/10, Training Loss: 0.6970135352455873, Validation Loss: 0.7122189178641907  
Accuracy: 0.5169491525423728, Precision: 0.5311581552604246, Recall: 0.5169491525423  
728, F1-score: 0.44170746786039183

Epoch 7/10 (Train): 100% | [██████████] | 1  
17/117 [00:17<00:00, 6.76sample/s]

Epoch 7/10 (Eval): 100% | [██████████] |  
71/71 [00:04<00:00, 15.01sample/s]

Epoch 7/10, Training Loss: 0.6917361481902525, Validation Loss: 0.7350844107778732  
Accuracy: 0.519774011299435, Precision: 0.5197907619235801, Recall: 0.51977401129943  
5, F1-score: 0.5160177243061459

Epoch 8/10 (Train): 100% | [██████████] | 1  
17/117 [00:17<00:00, 6.72sample/s]

Epoch 8/10 (Eval): 100% | [██████████] |  
71/71 [00:04<00:00, 14.65sample/s]

Epoch 8/10, Training Loss: 0.6924045112534487, Validation Loss: 0.7141005048307322  
Accuracy: 0.5361581920903955, Precision: 0.5371855809383445, Recall: 0.5361581920903  
955, F1-score: 0.5304602479873649

Epoch 9/10 (Train): 100% | [██████████] | 1  
17/117 [00:17<00:00, 6.80sample/s]

Epoch 9/10 (Eval): 100% | [██████████] |  
71/71 [00:04<00:00, 14.77sample/s]

Epoch 00009: reducing learning rate of group 0 to 1.0000e-05.

Epoch 9/10, Training Loss: 0.693902784299195, Validation Loss: 0.7140397719070737  
Accuracy: 0.535593220338983, Precision: 0.540908194521427, Recall: 0.53559322033898  
3, F1-score: 0.5155293578593902

Epoch 10/10 (Train): 100% | [██████████] | 1  
17/117 [00:17<00:00, 6.75sample/s]

Epoch 10/10 (Eval): 100% | [██████████] |  
71/71 [00:04<00:00, 14.84sample/s]

Epoch 10/10, Training Loss: 0.6866074947966743, Validation Loss: 0.7082672370018932  
Accuracy: 0.5186440677966102, Precision: 0.519743864802865, Recall: 0.51864406779661  
02, F1-score: 0.5043956494016483

Тренировка завершена!

Test: 100% | [██████████] |  
72/72 [00:05<00:00, 14.24sample/s]

```
Test Accuracy: 0.5156075808249722
Precision: 0.5196558738557373, Recall: 0.5156075808249722, F1-score: 0.4993065201056
0195
Accuracy of cats : 69 %
Accuracy of dogs : 33 %
```

```
Class_name: cats
Train_count: 900
Test_count: 300
Valid_count: 300
```

```
Shutil images: 100%|██████████| 150
0/1500 [00:00<00:00, 1796.12image/s]
```

```
Class_name: dogs
Train_count: 900
Test_count: 300
Valid_count: 300
```

```
Shutil images: 100%|██████████| 150
0/1500 [00:00<00:00, 1757.35image/s]
```

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```
-----  
Выбранная модель: regnet_y_1_6gf
Пользовательское название модели: regnet_y_1_6gf_Exp2
Выбранный оптимизатор: SGD
```

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```
Epoch 1/10 (Train): 100%|██████████| 1
17/117 [00:18<00:00, 6.18sample/s]
Epoch 1/10 (Eval): 100%|██████████| 1
71/71 [00:04<00:00, 14.40sample/s]
```

```
Epoch 1/10, Training Loss: 0.7136571560938334, Validation Loss: 0.898057578647204
Accuracy: 0.47627118644067795, Precision: 0.47612741333428593, Recall: 0.47627118644
067795, F1-score: 0.4722323094845743
```

```
Epoch 2/10 (Train): 100%|██████████| 1
17/117 [00:18<00:00, 6.19sample/s]
Epoch 2/10 (Eval): 100%|██████████| 1
71/71 [00:04<00:00, 14.63sample/s]
```

```
Epoch 2/10, Training Loss: 0.7029807072939332, Validation Loss: 1.0122434638314328
Accuracy: 0.5129943502824859, Precision: 0.5301307067186997, Recall: 0.5129943502824
859, F1-score: 0.41611666529295105
```

```
Epoch 3/10 (Train): 100%|██████████| 1
17/117 [00:19<00:00, 6.15sample/s]
Epoch 3/10 (Eval): 100%|██████████| 1
71/71 [00:04<00:00, 14.54sample/s]
```

```
Epoch 3/10, Training Loss: 0.7100194298319801, Validation Loss: 0.7469198126240638
Accuracy: 0.5101694915254237, Precision: 0.5099491754371518, Recall: 0.5101694915254
237, F1-score: 0.5024111988803311
```

```
Epoch 4/10 (Train): 100%|██████████| 1
17/117 [00:18<00:00, 6.29sample/s]
Epoch 4/10 (Eval): 100%|██████████| 1
71/71 [00:04<00:00, 14.74sample/s]
```

Epoch 4/10, Training Loss: 0.7128583063784334, Validation Loss: 0.8987342674853438  
Accuracy: 0.5084745762711864, Precision: 0.5083695661363036, Recall: 0.5084745762711  
864, F1-score: 0.4909781984104773

Epoch 5/10 (Train): 100% | ██████████ | 1  
17/117 [00:18<00:00, 6.28sample/s]  
Epoch 5/10 (Eval): 100% | ██████████ |  
71/71 [00:04<00:00, 14.84sample/s]

Epoch 5/10, Training Loss: 0.7060642767812788, Validation Loss: 0.7423597841949786  
Accuracy: 0.4903954802259887, Precision: 0.48943971584780915, Recall: 0.490395480225  
9887, F1-score: 0.4859856936921195

Epoch 6/10 (Train): 100% | ██████████ | 1  
17/117 [00:18<00:00, 6.20sample/s]  
Epoch 6/10 (Eval): 100% | ██████████ |  
71/71 [00:04<00:00, 14.57sample/s]

Epoch 6/10, Training Loss: 0.7027096547621632, Validation Loss: 0.8644887035512655  
Accuracy: 0.5214689265536723, Precision: 0.5258814375550067, Recall: 0.5214689265536  
723, F1-score: 0.5064501723285981

Epoch 7/10 (Train): 100% | ██████████ | 1  
17/117 [00:18<00:00, 6.30sample/s]  
Epoch 7/10 (Eval): 100% | ██████████ |  
71/71 [00:04<00:00, 14.79sample/s]

Epoch 7/10, Training Loss: 0.706716956551542, Validation Loss: 0.7943155029735997  
Accuracy: 0.5101694915254237, Precision: 0.5318046403827515, Recall: 0.5101694915254  
237, F1-score: 0.4247416191042049

Epoch 8/10 (Train): 100% | ██████████ | 1  
17/117 [00:18<00:00, 6.24sample/s]  
Epoch 8/10 (Eval): 100% | ██████████ |  
71/71 [00:04<00:00, 14.55sample/s]

Epoch 8/10, Training Loss: 0.6976088000736695, Validation Loss: 0.7382342817082916  
Accuracy: 0.5384180790960452, Precision: 0.5688216320864992, Recall: 0.5384180790960  
452, F1-score: 0.4861804960449409

Epoch 9/10 (Train): 100% | ██████████ | 1  
17/117 [00:18<00:00, 6.23sample/s]  
Epoch 9/10 (Eval): 100% | ██████████ |  
71/71 [00:04<00:00, 14.68sample/s]

Epoch 9/10, Training Loss: 0.7048814196357203, Validation Loss: 0.7478646662949169  
Accuracy: 0.5180790960451978, Precision: 0.5315773724025663, Recall: 0.5180790960451  
978, F1-score: 0.4705283524704779

Epoch 10/10 (Train): 100% | ██████████ | 1  
17/117 [00:18<00:00, 6.26sample/s]  
Epoch 10/10 (Eval): 100% | ██████████ |  
71/71 [00:04<00:00, 14.79sample/s]

Epoch 10/10, Training Loss: 0.6992566362279388, Validation Loss: 0.7954387115893391  
Accuracy: 0.5225988700564972, Precision: 0.5438441957641115, Recall: 0.5225988700564  
972, F1-score: 0.46509744125875935

Тренировка завершена!

Test: 100% | ██████████ |  
72/72 [00:05<00:00, 13.78sample/s]

```
Test Accuracy: 0.5206243032329989
Precision: 0.5331995596210476, Recall: 0.5206243032329989, F1-score: 0.4580075012888
1457
Accuracy of cats : 17 %
Accuracy of dogs : 85 %
```

```
Class_name: cats
```

```
Train_count: 900
```

```
Test_count: 300
```

```
Valid_count: 300
```

```
Shutil images: 100%|██████████| 150
0/1500 [00:00<00:00, 1858.87image/s]
```

```
Class_name: dogs
```

```
Train_count: 900
```

```
Test_count: 300
```

```
Valid_count: 300
```

```
Shutil images: 100%|██████████| 150
0/1500 [00:00<00:00, 1840.16image/s]
```

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```
Выбранная модель: regnet_y_3_2gf
```

```
Пользовательское название модели: regnet_y_3_2gf_Exp2
```

```
Выбранный оптимизатор: SGD
```

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```
Epoch 1/10 (Train): 100%|██████████| 1
17/117 [00:17<00:00, 6.84sample/s]
Epoch 1/10 (Eval): 100%|██████████| 1
71/71 [00:04<00:00, 15.63sample/s]
```

```
Epoch 1/10, Training Loss: 0.7035984135780138, Validation Loss: 1.2482287882074798
Accuracy: 0.5033898305084745, Precision: 0.5035871009299892, Recall: 0.5033898305084745, F1-score: 0.50310231803062
```

```
Epoch 2/10 (Train): 100%|██████████| 1
17/117 [00:16<00:00, 6.89sample/s]
Epoch 2/10 (Eval): 100%|██████████| 1
71/71 [00:04<00:00, 15.39sample/s]
```

```
Epoch 2/10, Training Loss: 0.7056530541980389, Validation Loss: 1.049153928450272
Accuracy: 0.48926553672316386, Precision: 0.4890205959235194, Recall: 0.48926553672316386, F1-score: 0.4713607588388111
```

```
Epoch 3/10 (Train): 100%|██████████| 1
17/117 [00:16<00:00, 6.89sample/s]
Epoch 3/10 (Eval): 100%|██████████| 1
71/71 [00:04<00:00, 15.76sample/s]
```

```
Epoch 3/10, Training Loss: 0.7030336597735939, Validation Loss: 0.7537960064949962
Accuracy: 0.48926553672316386, Precision: 0.4893644041270963, Recall: 0.48926553672316386, F1-score: 0.48919249649275526
```

```
Epoch 4/10 (Train): 100%|██████████| 1
17/117 [00:17<00:00, 6.79sample/s]
Epoch 4/10 (Eval): 100%|██████████| 1
71/71 [00:04<00:00, 15.30sample/s]
```

Epoch 4/10, Training Loss: 0.7014831595404452, Validation Loss: 0.8225851521990394  
Accuracy: 0.5124293785310734, Precision: 0.5132065164589608, Recall: 0.5124293785310734, F1-score: 0.5099922594204076

Epoch 5/10 (Train): 100% | [██████████] | 1  
17/117 [00:17<00:00, 6.79sample/s]

Epoch 5/10 (Eval): 100% | [██████████] |  
71/71 [00:04<00:00, 15.24sample/s]

Epoch 5/10, Training Loss: 0.6999834935689709, Validation Loss: 0.7614511512430374  
Accuracy: 0.5033898305084745, Precision: 0.5023091276628829, Recall: 0.5033898305084745, F1-score: 0.47326289563269813

Epoch 6/10 (Train): 100% | [██████████] | 1  
17/117 [00:17<00:00, 6.75sample/s]

Epoch 6/10 (Eval): 100% | [██████████] |  
71/71 [00:04<00:00, 15.36sample/s]

Epoch 00006: reducing learning rate of group 0 to 1.0000e-04.

Epoch 6/10, Training Loss: 0.6939442171059114, Validation Loss: 0.7957376822576685  
Accuracy: 0.5056497175141242, Precision: 0.5069678499486863, Recall: 0.5056497175141242, F1-score: 0.42642885365647876

Epoch 7/10 (Train): 100% | [██████████] | 1  
17/117 [00:17<00:00, 6.67sample/s]

Epoch 7/10 (Eval): 100% | [██████████] |  
71/71 [00:04<00:00, 15.35sample/s]

Epoch 7/10, Training Loss: 0.6979428468291292, Validation Loss: 0.7316689162941302  
Accuracy: 0.5056497175141242, Precision: 0.5059127850373627, Recall: 0.5056497175141242, F1-score: 0.44854128054853737

Epoch 8/10 (Train): 100% | [██████████] | 1  
17/117 [00:17<00:00, 6.68sample/s]

Epoch 8/10 (Eval): 100% | [██████████] |  
71/71 [00:05<00:00, 14.14sample/s]

Epoch 8/10, Training Loss: 0.6977160074252033, Validation Loss: 0.7246021360664044  
Accuracy: 0.5011299435028248, Precision: 0.49979774317517184, Recall: 0.5011299435028248, F1-score: 0.48140702464863305

Epoch 9/10 (Train): 100% | [██████████] | 1  
17/117 [00:19<00:00, 5.97sample/s]

Epoch 9/10 (Eval): 100% | [██████████] |  
71/71 [00:05<00:00, 12.46sample/s]

Epoch 9/10, Training Loss: 0.6960551015699852, Validation Loss: 0.7408152017216224  
Accuracy: 0.4971751412429379, Precision: 0.49521246315449813, Recall: 0.4971751412429379, F1-score: 0.47812541416169935

Epoch 10/10 (Train): 100% | [██████████] | 1  
17/117 [00:20<00:00, 5.79sample/s]

Epoch 10/10 (Eval): 100% | [██████████] |  
71/71 [00:05<00:00, 13.31sample/s]

Epoch 10/10, Training Loss: 0.6944243707198048, Validation Loss: 0.7384681610737817  
Accuracy: 0.5152542372881356, Precision: 0.5170164555843991, Recall: 0.5152542372881356, F1-score: 0.4907524414998138

Тренировка завершена!

Test: 100% | [██████████] |  
72/72 [00:05<00:00, 12.87sample/s]

```
Test Accuracy: 0.5128205128205128
Precision: 0.5184110845007777, Recall: 0.5128205128205128, F1-score: 0.4867143336727
968
Accuracy of cats : 74 %
Accuracy of dogs : 28 %
```

```
Class_name: cats
```

```
Train_count: 900
```

```
Test_count: 300
```

```
Valid_count: 300
```

```
Shutil images: 100%|██████████| 150
0/1500 [00:00<00:00, 1558.54image/s]
```

```
Class_name: dogs
```

```
Train_count: 900
```

```
Test_count: 300
```

```
Valid_count: 300
```

```
Shutil images: 100%|██████████| 150
0/1500 [00:00<00:00, 1636.97image/s]
```

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```
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```

Выбранная модель: regnet\_y\_400mf

Пользовательское название модели: regnet\_y\_400mf\_Exp2

Выбранный оптимизатор: SGD

```
-----
```

```
Epoch 1/10 (Train): 100%|██████████| 1
17/117 [00:15<00:00, 7.77sample/s]
Epoch 1/10 (Eval): 100%|██████████| 1
71/71 [00:04<00:00, 14.89sample/s]
```

```
Epoch 1/10, Training Loss: 0.7457938020171988, Validation Loss: 0.8150405092427959
Accuracy: 0.47909604519774013, Precision: 0.47922074121648767, Recall: 0.47909604519
774013, F1-score: 0.47743465573656085
```

```
Epoch 2/10 (Train): 100%|██████████| 1
17/117 [00:13<00:00, 8.48sample/s]
Epoch 2/10 (Eval): 100%|██████████| 1
71/71 [00:04<00:00, 16.98sample/s]
```

```
Epoch 2/10, Training Loss: 0.7469976271960334, Validation Loss: 0.7699023791625674
Accuracy: 0.488135593220339, Precision: 0.4881131161013437, Recall: 0.48813559322033
9, F1-score: 0.47704112536599974
```

```
Epoch 3/10 (Train): 100%|██████████| 1
17/117 [00:13<00:00, 8.78sample/s]
Epoch 3/10 (Eval): 100%|██████████| 1
71/71 [00:04<00:00, 16.82sample/s]
```

```
Epoch 3/10, Training Loss: 0.7382871385702153, Validation Loss: 0.7389316267549655
Accuracy: 0.4937853107344633, Precision: 0.49428867175140556, Recall: 0.493785310734
4633, F1-score: 0.4857075109827426
```

```
Epoch 4/10 (Train): 100%|██████████| 1
17/117 [00:13<00:00, 8.88sample/s]
Epoch 4/10 (Eval): 100%|██████████| 1
71/71 [00:04<00:00, 17.05sample/s]
```

Epoch 4/10, Training Loss: 0.7180683209314379, Validation Loss: 0.797668449370201  
Accuracy: 0.5084745762711864, Precision: 0.5186647124938183, Recall: 0.5084745762711  
864, F1-score: 0.40400970336456843

Epoch 5/10 (Train): 100% | ██████████ | 1  
17/117 [00:13<00:00, 8.72sample/s]

Epoch 5/10 (Eval): 100% | ██████████ |  
71/71 [00:04<00:00, 16.47sample/s]

Epoch 5/10, Training Loss: 0.7343820401073731, Validation Loss: 0.7446400674722963  
Accuracy: 0.507909604519774, Precision: 0.5201057330423421, Recall: 0.50790960451977  
4, F1-score: 0.4400312486869697

Epoch 6/10 (Train): 100% | ██████████ | 1  
17/117 [00:13<00:00, 8.73sample/s]

Epoch 6/10 (Eval): 100% | ██████████ |  
71/71 [00:04<00:00, 16.82sample/s]

Epoch 6/10, Training Loss: 0.717108686560208, Validation Loss: 0.7149467569286541  
Accuracy: 0.4943502824858757, Precision: 0.49424880966969925, Recall: 0.494350282485  
8757, F1-score: 0.4942009223202887

Epoch 7/10 (Train): 100% | ██████████ | 1  
17/117 [00:13<00:00, 8.83sample/s]

Epoch 7/10 (Eval): 100% | ██████████ |  
71/71 [00:04<00:00, 16.78sample/s]

Epoch 7/10, Training Loss: 0.72400508641787, Validation Loss: 0.7081013899401757  
Accuracy: 0.5129943502824859, Precision: 0.513130841798589, Recall: 0.51299435028248  
59, F1-score: 0.5128948503253209

Epoch 8/10 (Train): 100% | ██████████ | 1  
17/117 [00:12<00:00, 9.12sample/s]

Epoch 8/10 (Eval): 100% | ██████████ |  
71/71 [00:04<00:00, 16.38sample/s]

Epoch 8/10, Training Loss: 0.7156621550571468, Validation Loss: 0.7030192952034837  
Accuracy: 0.5175141242937853, Precision: 0.52043801560822, Recall: 0.517514124293785  
3, F1-score: 0.5063826196678292

Epoch 9/10 (Train): 100% | ██████████ | 1  
17/117 [00:13<00:00, 8.98sample/s]

Epoch 9/10 (Eval): 100% | ██████████ |  
71/71 [00:04<00:00, 17.17sample/s]

Epoch 9/10, Training Loss: 0.720270503529978, Validation Loss: 0.74903794146527  
Accuracy: 0.5062146892655367, Precision: 0.5161689290105496, Recall: 0.5062146892655  
367, F1-score: 0.44082539787324165

Epoch 10/10 (Train): 100% | ██████████ | 1  
17/117 [00:12<00:00, 9.13sample/s]

Epoch 10/10 (Eval): 100% | ██████████ |  
71/71 [00:04<00:00, 17.36sample/s]

Epoch 10/10, Training Loss: 0.7194189258252632, Validation Loss: 0.7233394645364944  
Accuracy: 0.5254237288135594, Precision: 0.5256275850994377, Recall: 0.5254237288135  
594, F1-score: 0.5216149000779442

Тренировка завершена!

Test: 100% | ██████████ |  
72/72 [00:04<00:00, 16.52sample/s]

```
Test Accuracy: 0.5089186176142698
Precision: 0.5098566115453627, Recall: 0.5089186176142698, F1-score: 0.5056540185738
485
Accuracy of cats : 59 %
Accuracy of dogs : 42 %
```

```
Class_name: cats
```

```
Train_count: 900
```

```
Test_count: 300
```

```
Valid_count: 300
```

```
Shutil images: 100%|██████████| 150
0/1500 [00:00<00:00, 1846.33image/s]
```

```
Class_name: dogs
```

```
Train_count: 900
```

```
Test_count: 300
```

```
Valid_count: 300
```

```
Shutil images: 100%|██████████| 150
0/1500 [00:00<00:00, 1826.40image/s]
```

---

```
Выбранная модель: regnet_y_800mf
```

```
Пользовательское название модели: regnet_y_800mf_Exp2
```

```
Выбранный оптимизатор: SGD
```

---

```
Epoch 1/10 (Train): 100%|██████████| 1
17/117 [00:12<00:00, 9.61sample/s]
Epoch 1/10 (Eval): 100%|██████████| 1
71/71 [00:03<00:00, 19.55sample/s]
```

```
Epoch 1/10, Training Loss: 0.7098497834402261, Validation Loss: 0.7178352599763601
Accuracy: 0.5112994350282486, Precision: 0.5117279432095231, Recall: 0.5112994350282
486, F1-score: 0.4924416202911619
```

```
Epoch 2/10 (Train): 100%|██████████| 1
17/117 [00:12<00:00, 9.63sample/s]
Epoch 2/10 (Eval): 100%|██████████| 1
71/71 [00:03<00:00, 19.20sample/s]
```

```
Epoch 2/10, Training Loss: 0.7072125232916108, Validation Loss: 0.719849665454552
Accuracy: 0.523728813559322, Precision: 0.525681345483872, Recall: 0.52372881355932
2, F1-score: 0.5182452757877469
```

```
Epoch 3/10 (Train): 100%|██████████| 1
17/117 [00:12<00:00, 9.46sample/s]
Epoch 3/10 (Eval): 100%|██████████| 1
71/71 [00:03<00:00, 19.02sample/s]
```

```
Epoch 3/10, Training Loss: 0.6996633542567184, Validation Loss: 0.7096976329714565
Accuracy: 0.5152542372881356, Precision: 0.5223601550247173, Recall: 0.5152542372881
356, F1-score: 0.45859327537436173
```

```
Epoch 4/10 (Train): 100%|██████████| 1
17/117 [00:12<00:00, 9.61sample/s]
Epoch 4/10 (Eval): 100%|██████████| 1
71/71 [00:03<00:00, 19.18sample/s]
```

Epoch 4/10, Training Loss: 0.7018718320069853, Validation Loss: 0.704713456543152  
Accuracy: 0.5214689265536723, Precision: 0.5227938615953144, Recall: 0.5214689265536723, F1-score: 0.5081653556126919

Epoch 5/10 (Train): 100% | [██████████] | 1  
17/117 [00:12<00:00, 9.51sample/s]

Epoch 5/10 (Eval): 100% | [██████████] |  
71/71 [00:03<00:00, 18.71sample/s]

Epoch 5/10, Training Loss: 0.700004681176746, Validation Loss: 0.7226024904830307  
Accuracy: 0.5254237288135594, Precision: 0.5317896882978452, Recall: 0.5254237288135594, F1-score: 0.49288553290076204

Epoch 6/10 (Train): 100% | [██████████] | 1  
17/117 [00:12<00:00, 9.74sample/s]

Epoch 6/10 (Eval): 100% | [██████████] |  
71/71 [00:03<00:00, 19.27sample/s]

Epoch 6/10, Training Loss: 0.701131054830715, Validation Loss: 0.748464231437209  
Accuracy: 0.5316384180790961, Precision: 0.5328071519227368, Recall: 0.5316384180790961, F1-score: 0.5242201659420929

Epoch 7/10 (Train): 100% | [██████████] | 1  
17/117 [00:12<00:00, 9.69sample/s]

Epoch 7/10 (Eval): 100% | [██████████] |  
71/71 [00:03<00:00, 19.15sample/s]

Epoch 00007: reducing learning rate of group 0 to 1.0000e-04.

Epoch 7/10, Training Loss: 0.6983529968360036, Validation Loss: 0.714964642699829  
Accuracy: 0.5288135593220339, Precision: 0.5303379909304468, Recall: 0.5288135593220339, F1-score: 0.5187417141940789

Epoch 8/10 (Train): 100% | [██████████] | 1  
17/117 [00:12<00:00, 9.57sample/s]

Epoch 8/10 (Eval): 100% | [██████████] |  
71/71 [00:03<00:00, 18.55sample/s]

Epoch 8/10, Training Loss: 0.6927098345101085, Validation Loss: 0.6996500796854159  
Accuracy: 0.5344632768361582, Precision: 0.5402037719891402, Recall: 0.5344632768361582, F1-score: 0.5124346564347966

Epoch 9/10 (Train): 100% | [██████████] | 1  
17/117 [00:12<00:00, 9.52sample/s]

Epoch 9/10 (Eval): 100% | [██████████] |  
71/71 [00:03<00:00, 19.55sample/s]

Epoch 9/10, Training Loss: 0.6891621611372302, Validation Loss: 0.7011313022530011  
Accuracy: 0.5259887005649717, Precision: 0.5324138929758911, Recall: 0.5259887005649717, F1-score: 0.4939528394283604

Epoch 10/10 (Train): 100% | [██████████] | 1  
17/117 [00:12<00:00, 9.75sample/s]

Epoch 10/10 (Eval): 100% | [██████████] |  
71/71 [00:03<00:00, 19.55sample/s]

Epoch 10/10, Training Loss: 0.7004560116435244, Validation Loss: 0.7028921014171535  
Accuracy: 0.5124293785310734, Precision: 0.5139018566027861, Recall: 0.5124293785310734, F1-score: 0.48373389869926825

Тренировка завершена!

Test: 100% | [██████████] |  
72/72 [00:04<00:00, 17.83sample/s]

```
Test Accuracy: 0.512263099219621
Precision: 0.5189039080129892, Recall: 0.512263099219621, F1-score: 0.48051160446704
31
Accuracy of cats : 76 %
Accuracy of dogs : 26 %
```

```
Class_name: cats
```

```
Train_count: 900
```

```
Test_count: 300
```

```
Valid_count: 300
```

```
Shutil images: 100%|██████████| 150
0/1500 [00:00<00:00, 1809.39image/s]
```

```
Class_name: dogs
```

```
Train_count: 900
```

```
Test_count: 300
```

```
Valid_count: 300
```

```
Shutil images: 100%|██████████| 150
0/1500 [00:00<00:00, 1853.27image/s]
```

---

```
Выбранная модель: regnet_y_8gf
```

```
Пользовательское название модели: regnet_y_8gf_Exp2
```

```
Выбранный оптимизатор: SGD
```

---

```
Epoch 1/10 (Train): 100%|██████████| 1
17/117 [00:15<00:00, 7.47sample/s]
Epoch 1/10 (Eval): 100%|██████████| 1
71/71 [00:04<00:00, 16.63sample/s]
```

```
Epoch 1/10, Training Loss: 0.6976487213598493, Validation Loss: 0.7363222639607845
Accuracy: 0.48192090395480225, Precision: 0.46600062098188194, Recall: 0.48192090395
480225, F1-score: 0.4230062421967408
```

```
Epoch 2/10 (Train): 100%|██████████| 1
17/117 [00:15<00:00, 7.75sample/s]
Epoch 2/10 (Eval): 100%|██████████| 1
71/71 [00:04<00:00, 17.19sample/s]
```

```
Epoch 2/10, Training Loss: 0.699202282014991, Validation Loss: 0.7228579601999057
Accuracy: 0.5209039548022599, Precision: 0.5207768841385224, Recall: 0.5209039548022
599, F1-score: 0.520024282224825
```

```
Epoch 3/10 (Train): 100%|██████████| 1
17/117 [00:14<00:00, 8.15sample/s]
Epoch 3/10 (Eval): 100%|██████████| 1
71/71 [00:04<00:00, 17.32sample/s]
```

```
Epoch 3/10, Training Loss: 0.7008630642571401, Validation Loss: 0.72617601573804
Accuracy: 0.4943502824858757, Precision: 0.4725355044274979, Recall: 0.4943502824858
757, F1-score: 0.3879376891115977
```

```
Epoch 4/10 (Train): 100%|██████████| 1
17/117 [00:14<00:00, 8.15sample/s]
Epoch 4/10 (Eval): 100%|██████████| 1
71/71 [00:04<00:00, 17.14sample/s]
```

Epoch 4/10, Training Loss: 0.7037571015226882, Validation Loss: 0.7076958855666683  
Accuracy: 0.515819209039548, Precision: 0.516422775930791, Recall: 0.51581920903954  
8, F1-score: 0.5143667994645975

Epoch 5/10 (Train): 100% | ██████████ | 1  
17/117 [00:14<00:00, 7.96sample/s]  
Epoch 5/10 (Eval): 100% | ██████████ |  
71/71 [00:04<00:00, 17.17sample/s]

Epoch 5/10, Training Loss: 0.6961052069549298, Validation Loss: 0.7355101398155515  
Accuracy: 0.507909604519774, Precision: 0.5079287056351349, Recall: 0.50790960451977  
4, F1-score: 0.5079151021204713

Epoch 6/10 (Train): 100% | ██████████ | 1  
17/117 [00:14<00:00, 8.05sample/s]  
Epoch 6/10 (Eval): 100% | ██████████ |  
71/71 [00:04<00:00, 17.11sample/s]

Epoch 6/10, Training Loss: 0.6997178761205313, Validation Loss: 0.7348264630904979  
Accuracy: 0.5022598870056497, Precision: 0.509660745788233, Recall: 0.50225988700564  
97, F1-score: 0.42947239144798255

Epoch 7/10 (Train): 100% | ██████████ | 1  
17/117 [00:15<00:00, 7.64sample/s]  
Epoch 7/10 (Eval): 100% | ██████████ |  
71/71 [00:04<00:00, 15.76sample/s]

Epoch 7/10, Training Loss: 0.698017696129907, Validation Loss: 0.6973152973894345  
Accuracy: 0.5457627118644067, Precision: 0.546083563644096, Recall: 0.54576271186440  
67, F1-score: 0.5454871049750053

Epoch 8/10 (Train): 100% | ██████████ | 1  
17/117 [00:15<00:00, 7.51sample/s]  
Epoch 8/10 (Eval): 100% | ██████████ |  
71/71 [00:04<00:00, 15.49sample/s]

Epoch 8/10, Training Loss: 0.6910477799853099, Validation Loss: 0.8374044836240974  
Accuracy: 0.519774011299435, Precision: 0.5237168209749201, Recall: 0.51977401129943  
5, F1-score: 0.5055926354986845

Epoch 9/10 (Train): 100% | ██████████ | 1  
17/117 [00:14<00:00, 7.82sample/s]  
Epoch 9/10 (Eval): 100% | ██████████ |  
71/71 [00:04<00:00, 16.74sample/s]

Epoch 9/10, Training Loss: 0.6951577870296859, Validation Loss: 0.7201186165971271  
Accuracy: 0.535593220338983, Precision: 0.5369135656455776, Recall: 0.53559322033898  
3, F1-score: 0.5331582995323233

Epoch 10/10 (Train): 100% | ██████████ | 1  
17/117 [00:15<00:00, 7.69sample/s]  
Epoch 10/10 (Eval): 100% | ██████████ |  
71/71 [00:04<00:00, 15.96sample/s]

Epoch 00010: reducing learning rate of group 0 to 1.0000e-04.

Epoch 10/10, Training Loss: 0.6973420670352031, Validation Loss: 0.8420416620996712  
Accuracy: 0.5372881355932203, Precision: 0.5609051568698161, Recall: 0.537288135593  
203, F1-score: 0.4927564215149417

Тренировка завершена!

Test: 100% | ██████████ |  
72/72 [00:04<00:00, 14.86sample/s]

```
Test Accuracy: 0.5217391304347826
Precision: 0.5305871840274542, Recall: 0.5217391304347826, F1-score: 0.4729933981574
1465
Accuracy of cats : 21 %
Accuracy of dogs : 82 %
```

```
Class_name: cats
```

```
Train_count: 900
```

```
Test_count: 300
```

```
Valid_count: 300
```

```
Shutil images: 100%|██████████| 150
0/1500 [00:00<00:00, 1733.41image/s]
```

```
Class_name: dogs
```

```
Train_count: 900
```

```
Test_count: 300
```

```
Valid_count: 300
```

```
Shutil images: 100%|██████████| 150
0/1500 [00:00<00:00, 1698.66image/s]
```

---

```
-----
```

Выбранная модель: resnet101

Пользовательское название модели: resnet101\_Exp2

Выбранный оптимизатор: SGD

```
-----
```

```
Epoch 1/10 (Train): 100%|██████████| 1
17/117 [00:16<00:00, 6.88sample/s]
Epoch 1/10 (Eval): 100%|██████████| 1
71/71 [00:04<00:00, 15.35sample/s]
```

```
Epoch 1/10, Training Loss: 0.7414857725712032, Validation Loss: 0.7675083953108491
Accuracy: 0.5220338983050847, Precision: 0.5371902325105744, Recall: 0.5220338983050
847, F1-score: 0.4762257879392498
```

```
Epoch 2/10 (Train): 100%|██████████| 1
17/117 [00:16<00:00, 6.94sample/s]
Epoch 2/10 (Eval): 100%|██████████| 1
71/71 [00:04<00:00, 15.58sample/s]
```

```
Epoch 2/10, Training Loss: 0.7266845915120902, Validation Loss: 0.7202493996269959
Accuracy: 0.5350282485875706, Precision: 0.53512280018183, Recall: 0.535028248587570
6, F1-score: 0.5350001972826542
```

```
Epoch 3/10 (Train): 100%|██████████| 1
17/117 [00:16<00:00, 6.90sample/s]
Epoch 3/10 (Eval): 100%|██████████| 1
71/71 [00:04<00:00, 15.47sample/s]
```

```
Epoch 3/10, Training Loss: 0.725536196809454, Validation Loss: 1.0609750429452476
Accuracy: 0.4977401129943503, Precision: 0.7502904747296573, Recall: 0.4977401129943
503, F1-score: 0.33207752229346776
```

```
Epoch 4/10 (Train): 100%|██████████| 1
17/117 [00:16<00:00, 6.97sample/s]
Epoch 4/10 (Eval): 100%|██████████| 1
71/71 [00:04<00:00, 15.31sample/s]
```

Epoch 4/10, Training Loss: 0.7379009351902401, Validation Loss: 0.7311212991253805  
Accuracy: 0.5050847457627119, Precision: 0.5049948656850366, Recall: 0.5050847457627119, F1-score: 0.4463256745944398

Epoch 5/10 (Train): 100% | ██████████ | 1  
17/117 [00:16<00:00, 6.96sample/s]  
Epoch 5/10 (Eval): 100% | ██████████ |  
71/71 [00:04<00:00, 15.74sample/s]

Epoch 00005: reducing learning rate of group 0 to 1.0000e-04.

Epoch 5/10, Training Loss: 0.7244574821896569, Validation Loss: 0.7364553414327276  
Accuracy: 0.5016949152542373, Precision: 0.4941266938318771, Recall: 0.5016949152542373, F1-score: 0.38039200244007304

Epoch 6/10 (Train): 100% | ██████████ | 1  
17/117 [00:16<00:00, 6.95sample/s]  
Epoch 6/10 (Eval): 100% | ██████████ |  
71/71 [00:04<00:00, 15.66sample/s]

Epoch 6/10, Training Loss: 0.7116243996980673, Validation Loss: 0.7105925406439829  
Accuracy: 0.5067796610169492, Precision: 0.5096597592620913, Recall: 0.5067796610169492, F1-score: 0.48686192462410116

Epoch 7/10 (Train): 100% | ██████████ | 1  
17/117 [00:16<00:00, 6.96sample/s]  
Epoch 7/10 (Eval): 100% | ██████████ |  
71/71 [00:04<00:00, 15.46sample/s]

Epoch 7/10, Training Loss: 0.7026774045528006, Validation Loss: 0.6989417197340626  
Accuracy: 0.5175141242937853, Precision: 0.5204774279370769, Recall: 0.5175141242937853, F1-score: 0.5062106639937328

Epoch 8/10 (Train): 100% | ██████████ | 1  
17/117 [00:16<00:00, 6.93sample/s]  
Epoch 8/10 (Eval): 100% | ██████████ |  
71/71 [00:04<00:00, 15.05sample/s]

Epoch 8/10, Training Loss: 0.7058225022148841, Validation Loss: 0.6947077125479273  
Accuracy: 0.5316384180790961, Precision: 0.5360280766048672, Recall: 0.5316384180790961, F1-score: 0.5207494868391567

Epoch 9/10 (Train): 100% | ██████████ | 1  
17/117 [00:16<00:00, 6.89sample/s]  
Epoch 9/10 (Eval): 100% | ██████████ |  
71/71 [00:04<00:00, 15.55sample/s]

Epoch 9/10, Training Loss: 0.6965079527745133, Validation Loss: 0.6988504293274744  
Accuracy: 0.5141242937853108, Precision: 0.51505689740422, Recall: 0.5141242937853108, F1-score: 0.5111598910989383

Epoch 10/10 (Train): 100% | ██████████ | 1  
17/117 [00:17<00:00, 6.85sample/s]  
Epoch 10/10 (Eval): 100% | ██████████ |  
71/71 [00:04<00:00, 15.19sample/s]

Epoch 10/10, Training Loss: 0.6958430604017067, Validation Loss: 0.696174668221824  
Accuracy: 0.5209039548022599, Precision: 0.521680781898919, Recall: 0.5209039548022599, F1-score: 0.5191198279967942

Тренировка завершена!

Test: 100% | ██████████ |  
72/72 [00:04<00:00, 14.45sample/s]

```
Test Accuracy: 0.5312151616499443
Precision: 0.5311841693770527, Recall: 0.5312151616499443, F1-score: 0.5296408555646
931
Accuracy of cats : 47 %
Accuracy of dogs : 58 %
```

```
Class_name: cats
```

```
Train_count: 900
```

```
Test_count: 300
```

```
Valid_count: 300
```

```
Shutil images: 100%|██████████| 150
0/1500 [00:00<00:00, 1790.79image/s]
```

```
Class_name: dogs
```

```
Train_count: 900
```

```
Test_count: 300
```

```
Valid_count: 300
```

```
Shutil images: 100%|██████████| 150
0/1500 [00:00<00:00, 1794.27image/s]
```

---

```
-----
```

Выбранная модель: resnet152

Пользовательское название модели: resnet152\_Exp2

Выбранный оптимизатор: SGD

```
-----
```

```
Epoch 1/10 (Train): 100%|██████████| 1
17/117 [00:22<00:00, 5.28sample/s]
Epoch 1/10 (Eval): 100%|██████████| 1
71/71 [00:05<00:00, 13.65sample/s]
```

Epoch 1/10, Training Loss: 0.7376031918624013, Validation Loss: 0.7743579498623724  
Accuracy: 0.503954802259887, Precision: 0.5089803294932, Recall: 0.503954802259887,  
F1-score: 0.35464217289784633

```
Epoch 2/10 (Train): 100%|██████████| 1
17/117 [00:21<00:00, 5.51sample/s]
Epoch 2/10 (Eval): 100%|██████████| 1
71/71 [00:05<00:00, 13.23sample/s]
```

Epoch 2/10, Training Loss: 0.7369906571517695, Validation Loss: 0.8444986818200451  
Accuracy: 0.5186440677966102, Precision: 0.5200697029147162, Recall: 0.5186440677966  
102, F1-score: 0.5019398708635997

```
Epoch 3/10 (Train): 100%|██████████| 1
17/117 [00:21<00:00, 5.35sample/s]
Epoch 3/10 (Eval): 100%|██████████| 1
71/71 [00:05<00:00, 13.64sample/s]
```

Epoch 3/10, Training Loss: 0.7349334128738678, Validation Loss: 0.780479732627249  
Accuracy: 0.5050847457627119, Precision: 0.5345487094625633, Recall: 0.5050847457627  
119, F1-score: 0.3505440009851479

```
Epoch 4/10 (Train): 100%|██████████| 1
17/117 [00:22<00:00, 5.20sample/s]
Epoch 4/10 (Eval): 100%|██████████| 1
71/71 [00:05<00:00, 13.56sample/s]
```

Epoch 00004: reducing learning rate of group 0 to 1.0000e-04.

Epoch 4/10, Training Loss: 0.7393941680590311, Validation Loss: 0.7806654185225061  
Accuracy: 0.5175141242937853, Precision: 0.5924207985224934, Recall: 0.5175141242937  
853, F1-score: 0.40167062557874605

Epoch 5/10 (Train): 100% | 1  
17/117 [00:21<00:00, 5.45sample/s]  
Epoch 5/10 (Eval): 100% |  
71/71 [00:05<00:00, 14.00sample/s]

Epoch 5/10, Training Loss: 0.7096556195688412, Validation Loss: 0.7331882508124336  
Accuracy: 0.5141242937853108, Precision: 0.5321488360667375, Recall: 0.5141242937853  
108, F1-score: 0.44734982245382077

Epoch 6/10 (Train): 100% | 1  
17/117 [00:21<00:00, 5.38sample/s]  
Epoch 6/10 (Eval): 100% |  
71/71 [00:05<00:00, 13.95sample/s]

Epoch 6/10, Training Loss: 0.702221881892673, Validation Loss: 0.7000017927191352  
Accuracy: 0.5384180790960452, Precision: 0.5384923785259945, Recall: 0.5384180790960  
452, F1-score: 0.5384055556269388

Epoch 7/10 (Train): 100% | 1  
17/117 [00:21<00:00, 5.35sample/s]  
Epoch 7/10 (Eval): 100% |  
71/71 [00:05<00:00, 13.95sample/s]

Epoch 7/10, Training Loss: 0.7071476437381863, Validation Loss: 0.696909116823121  
Accuracy: 0.5129943502824859, Precision: 0.5130934861366002, Recall: 0.5129943502824  
86, F1-score: 0.512949578960647

Epoch 8/10 (Train): 100% | 1  
17/117 [00:21<00:00, 5.35sample/s]  
Epoch 8/10 (Eval): 100% |  
71/71 [00:05<00:00, 13.89sample/s]

Epoch 8/10, Training Loss: 0.7033949058080456, Validation Loss: 0.703416484055546  
Accuracy: 0.5180790960451978, Precision: 0.5231930161511772, Recall: 0.5180790960451  
978, F1-score: 0.4981506272901503

Epoch 9/10 (Train): 100% | 1  
17/117 [00:22<00:00, 5.24sample/s]  
Epoch 9/10 (Eval): 100% |  
71/71 [00:05<00:00, 13.81sample/s]

Epoch 9/10, Training Loss: 0.7013166519169954, Validation Loss: 0.6993631725594148  
Accuracy: 0.5282485875706214, Precision: 0.5281618469774052, Recall: 0.5282485875706  
214, F1-score: 0.5275769132778403

Epoch 10/10 (Train): 100% | 1  
17/117 [00:21<00:00, 5.35sample/s]  
Epoch 10/10 (Eval): 100% |  
71/71 [00:05<00:00, 13.97sample/s]

Epoch 00010: reducing learning rate of group 0 to 1.0000e-05.

Epoch 10/10, Training Loss: 0.7073101581576764, Validation Loss: 0.6972638166556924  
Accuracy: 0.5254237288135594, Precision: 0.5260387516373682, Recall: 0.5254237288135  
594, F1-score: 0.5243065430288377

Тренировка завершена!

Test: 100% |  
72/72 [00:05<00:00, 13.39sample/s]

```
Test Accuracy: 0.5167224080267558
Precision: 0.5165223075227541, Recall: 0.5167224080267558, F1-score: 0.5157176228360
866
Accuracy of cats : 47 %
Accuracy of dogs : 56 %
```

```
Class_name: cats
```

```
Train_count: 900
```

```
Test_count: 300
```

```
Valid_count: 300
```

```
Shutil images: 100%|██████████| 150
0/1500 [00:00<00:00, 1769.40image/s]
```

```
Class_name: dogs
```

```
Train_count: 900
```

```
Test_count: 300
```

```
Valid_count: 300
```

```
Shutil images: 100%|██████████| 150
0/1500 [00:00<00:00, 1784.31image/s]
```

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```

Выбранная модель: resnet18

Пользовательское название модели: resnet18\_Exp2

Выбранный оптимизатор: SGD

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```

```
Epoch 1/10 (Train): 100%|██████████| 1
17/117 [00:07<00:00, 14.98sample/s]
```

```
Epoch 1/10 (Eval): 100%|██████████| 1
71/71 [00:03<00:00, 22.81sample/s]
```

Epoch 1/10, Training Loss: 0.7001312871774038, Validation Loss: 0.7048603343424824  
Accuracy: 0.5, Precision: 0.49622845779938135, Recall: 0.5, F1-score: 0.440867816032  
331

```
Epoch 2/10 (Train): 100%|██████████| 1
17/117 [00:08<00:00, 14.59sample/s]
```

```
Epoch 2/10 (Eval): 100%|██████████| 1
71/71 [00:03<00:00, 23.35sample/s]
```

Epoch 2/10, Training Loss: 0.6929999112673232, Validation Loss: 0.6914673373524078  
Accuracy: 0.5525423728813559, Precision: 0.5723166165608734, Recall: 0.5525423728813  
559, F1-score: 0.5159883818488867

```
Epoch 3/10 (Train): 100%|██████████| 1
17/117 [00:07<00:00, 14.78sample/s]
```

```
Epoch 3/10 (Eval): 100%|██████████| 1
71/71 [00:03<00:00, 22.88sample/s]
```

Epoch 3/10, Training Loss: 0.6860889997269279, Validation Loss: 0.6801537561551326  
Accuracy: 0.5711864406779661, Precision: 0.5785356167078995, Recall: 0.5711864406779  
661, F1-score: 0.5590958245923023

```
Epoch 4/10 (Train): 100%|██████████| 1
17/117 [00:07<00:00, 14.82sample/s]
```

```
Epoch 4/10 (Eval): 100%|██████████| 1
71/71 [00:03<00:00, 23.41sample/s]
```

Epoch 4/10, Training Loss: 0.6764239465043307, Validation Loss: 0.6685810567295484  
Accuracy: 0.5937853107344633, Precision: 0.6006426363317953, Recall: 0.5937853107344  
633, F1-score: 0.5855805783968228

Epoch 5/10 (Train): 100% | ██████████ | 1  
17/117 [00:07<00:00, 14.92sample/s]  
Epoch 5/10 (Eval): 100% | ██████████ |  
71/71 [00:03<00:00, 23.57sample/s]

Epoch 5/10, Training Loss: 0.6736968158651463, Validation Loss: 0.6788950438721705  
Accuracy: 0.5581920903954802, Precision: 0.6361560572462888, Recall: 0.5581920903954  
802, F1-score: 0.4809312404407709

Epoch 6/10 (Train): 100% | ██████████ | 1  
17/117 [00:07<00:00, 14.82sample/s]  
Epoch 6/10 (Eval): 100% | ██████████ |  
71/71 [00:03<00:00, 23.15sample/s]

Epoch 6/10, Training Loss: 0.6651532624390527, Validation Loss: 0.660049526031408  
Accuracy: 0.6135593220338983, Precision: 0.6135718011338432, Recall: 0.6135593220338  
983, F1-score: 0.6134527042285299

Epoch 7/10 (Train): 100% | ██████████ | 1  
17/117 [00:07<00:00, 14.81sample/s]  
Epoch 7/10 (Eval): 100% | ██████████ |  
71/71 [00:03<00:00, 23.28sample/s]

Epoch 7/10, Training Loss: 0.6632801000400097, Validation Loss: 0.6579971206558626  
Accuracy: 0.6028248587570622, Precision: 0.6733832395874684, Recall: 0.6028248587570  
622, F1-score: 0.5558531917183375

Epoch 8/10 (Train): 100% | ██████████ | 1  
17/117 [00:07<00:00, 15.12sample/s]  
Epoch 8/10 (Eval): 100% | ██████████ |  
71/71 [00:02<00:00, 23.81sample/s]

Epoch 8/10, Training Loss: 0.6659099819119444, Validation Loss: 0.646936023302671  
Accuracy: 0.6338983050847458, Precision: 0.6517315371542451, Recall: 0.6338983050847  
458, F1-score: 0.6218343680177156

Epoch 9/10 (Train): 100% | ██████████ | 1  
17/117 [00:07<00:00, 14.67sample/s]  
Epoch 9/10 (Eval): 100% | ██████████ |  
71/71 [00:03<00:00, 22.58sample/s]

Epoch 9/10, Training Loss: 0.64965837415551, Validation Loss: 0.6362409076448214  
Accuracy: 0.6497175141242938, Precision: 0.6757994916135985, Recall: 0.6497175141242  
938, F1-score: 0.6352773799626064

Epoch 10/10 (Train): 100% | ██████████ | 1  
17/117 [00:07<00:00, 14.66sample/s]  
Epoch 10/10 (Eval): 100% | ██████████ |  
71/71 [00:03<00:00, 23.31sample/s]

Epoch 10/10, Training Loss: 0.6472875366301062, Validation Loss: 0.6403975636608856  
Accuracy: 0.631638418079096, Precision: 0.6725669757225845, Recall: 0.63163841807909  
6, F1-score: 0.6071000410151323

Тренировка завершена!

Test: 100% | ██████████ |  
72/72 [00:04<00:00, 17.78sample/s]

```
Test Accuracy: 0.6204013377926422
Precision: 0.6607679005699524, Recall: 0.6204013377926422, F1-score: 0.5966267181546
181
Accuracy of cats : 86 %
Accuracy of dogs : 37 %
```

```
Class_name: cats
```

```
Train_count: 900
```

```
Test_count: 300
```

```
Valid_count: 300
```

```
Shutil images: 100%|██████████| 150
0/1500 [00:00<00:00, 1739.47image/s]
```

```
Class_name: dogs
```

```
Train_count: 900
```

```
Test_count: 300
```

```
Valid_count: 300
```

```
Shutil images: 100%|██████████| 150
0/1500 [00:00<00:00, 1828.75image/s]
```

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```

Выбранная модель: resnet34

Пользовательское название модели: resnet34\_Exp2

Выбранный оптимизатор: SGD

```
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```

```
Epoch 1/10 (Train): 100%|██████████| 1
17/117 [00:09<00:00, 12.59sample/s]
Epoch 1/10 (Eval): 100%|██████████| 1
71/71 [00:03<00:00, 22.35sample/s]
```

```
Epoch 1/10, Training Loss: 0.7033062827136508, Validation Loss: 0.7059330313892688
Accuracy: 0.5333333333333333, Precision: 0.5416946397832513, Recall: 0.5333333333333333
333, F1-score: 0.5031397742870216
```

```
Epoch 2/10 (Train): 100%|██████████| 1
17/117 [00:09<00:00, 12.78sample/s]
Epoch 2/10 (Eval): 100%|██████████| 1
71/71 [00:03<00:00, 22.43sample/s]
```

```
Epoch 2/10, Training Loss: 0.7003586038281417, Validation Loss: 0.6944945907525424
Accuracy: 0.5338983050847458, Precision: 0.53581336117784, Recall: 0.533898305084745
8, F1-score: 0.5241723807138636
```

```
Epoch 3/10 (Train): 100%|██████████| 1
17/117 [00:09<00:00, 12.90sample/s]
Epoch 3/10 (Eval): 100%|██████████| 1
71/71 [00:03<00:00, 22.25sample/s]
```

```
Epoch 3/10, Training Loss: 0.6948073964143536, Validation Loss: 0.6990724446746589
Accuracy: 0.5175141242937853, Precision: 0.5308623996999138, Recall: 0.5175141242937
853, F1-score: 0.4463061328261388
```

```
Epoch 4/10 (Train): 100%|██████████| 1
17/117 [00:09<00:00, 12.62sample/s]
Epoch 4/10 (Eval): 100%|██████████| 1
71/71 [00:03<00:00, 22.16sample/s]
```

Epoch 4/10, Training Loss: 0.7044809813966456, Validation Loss: 0.7062416824243837  
Accuracy: 0.5112994350282486, Precision: 0.5228209859668307, Recall: 0.5112994350282486, F1-score: 0.42071775284475216

Epoch 5/10 (Train): 100% | ██████████ | 1  
17/117 [00:09<00:00, 12.57sample/s]  
Epoch 5/10 (Eval): 100% | ██████████ |  
71/71 [00:03<00:00, 22.47sample/s]

Epoch 5/10, Training Loss: 0.6862456486192355, Validation Loss: 0.6880646898584851  
Accuracy: 0.5350282485875706, Precision: 0.5373571286544896, Recall: 0.5350282485875706, F1-score: 0.5241954777421141

Epoch 6/10 (Train): 100% | ██████████ | 1  
17/117 [00:09<00:00, 12.75sample/s]  
Epoch 6/10 (Eval): 100% | ██████████ |  
71/71 [00:03<00:00, 22.38sample/s]

Epoch 6/10, Training Loss: 0.6899015528639567, Validation Loss: 0.6824466370593356  
Accuracy: 0.5661016949152542, Precision: 0.5670067408448975, Recall: 0.5661016949152542, F1-score: 0.563752204927138

Epoch 7/10 (Train): 100% | ██████████ | 1  
17/117 [00:09<00:00, 12.95sample/s]  
Epoch 7/10 (Eval): 100% | ██████████ |  
71/71 [00:03<00:00, 20.49sample/s]

Epoch 7/10, Training Loss: 0.6841139965450641, Validation Loss: 0.6821676874901615  
Accuracy: 0.5548022598870056, Precision: 0.6107136008613462, Recall: 0.5548022598870056, F1-score: 0.48668556020250936

Epoch 8/10 (Train): 100% | ██████████ | 1  
17/117 [00:09<00:00, 12.64sample/s]  
Epoch 8/10 (Eval): 100% | ██████████ |  
71/71 [00:03<00:00, 22.33sample/s]

Epoch 8/10, Training Loss: 0.6862867406963074, Validation Loss: 0.6801967445739918  
Accuracy: 0.5570621468926553, Precision: 0.5701071600726557, Recall: 0.5570621468926553, F1-score: 0.5324275484469136

Epoch 9/10 (Train): 100% | ██████████ | 1  
17/117 [00:09<00:00, 12.78sample/s]  
Epoch 9/10 (Eval): 100% | ██████████ |  
71/71 [00:03<00:00, 22.36sample/s]

Epoch 9/10, Training Loss: 0.6748983322345105, Validation Loss: 0.6704016706701053  
Accuracy: 0.584180790960452, Precision: 0.5848623441843781, Recall: 0.584180790960452, F1-score: 0.5837073126100779

Epoch 10/10 (Train): 100% | ██████████ | 1  
17/117 [00:08<00:00, 13.02sample/s]  
Epoch 10/10 (Eval): 100% | ██████████ |  
71/71 [00:03<00:00, 22.18sample/s]

Epoch 10/10, Training Loss: 0.6706553052381142, Validation Loss: 0.6723760578591945  
Accuracy: 0.572316384180791, Precision: 0.6258885158031795, Recall: 0.572316384180791, F1-score: 0.5185195721591493

Тренировка завершена!

Test: 100% | ██████████ |  
72/72 [00:03<00:00, 19.15sample/s]

```
Test Accuracy: 0.5696767001114827
Precision: 0.6318957481086698, Recall: 0.5696767001114827, F1-score: 0.5154429897536
735
Accuracy of cats : 90 %
Accuracy of dogs : 23 %
```

```
Class_name: cats
```

```
Train_count: 900
```

```
Test_count: 300
```

```
Valid_count: 300
```

```
Shutil images: 100%|██████████| 150
0/1500 [00:00<00:00, 1869.13image/s]
```

```
Class_name: dogs
```

```
Train_count: 900
```

```
Test_count: 300
```

```
Valid_count: 300
```

```
Shutil images: 100%|██████████| 150
0/1500 [00:00<00:00, 1744.96image/s]
```

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```

Выбранная модель: resnet50

Пользовательское название модели: resnet50\_Exp2

Выбранный оптимизатор: SGD

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```

```
Epoch 1/10 (Train): 100%|██████████| 1
17/117 [00:11<00:00, 10.36sample/s]
Epoch 1/10 (Eval): 100%|██████████| 1
71/71 [00:03<00:00, 20.84sample/s]
```

```
Epoch 1/10, Training Loss: 0.7382384162793045, Validation Loss: 0.7867051430341214
Accuracy: 0.5050847457627119, Precision: 0.5385813833186258, Recall: 0.5050847457627
119, F1-score: 0.38397607178464604
```

```
Epoch 2/10 (Train): 100%|██████████| 1
17/117 [00:10<00:00, 11.15sample/s]
Epoch 2/10 (Eval): 100%|██████████| 1
71/71 [00:03<00:00, 21.28sample/s]
```

```
Epoch 2/10, Training Loss: 0.7416687420348531, Validation Loss: 0.7271059168934149
Accuracy: 0.503954802259887, Precision: 0.5099403002703367, Recall: 0.50395480225988
7, F1-score: 0.45106875411501607
```

```
Epoch 3/10 (Train): 100%|██████████| 1
17/117 [00:10<00:00, 11.16sample/s]
Epoch 3/10 (Eval): 100%|██████████| 1
71/71 [00:03<00:00, 21.14sample/s]
```

```
Epoch 3/10, Training Loss: 0.7267517513016245, Validation Loss: 0.7063692919278549
Accuracy: 0.49830508474576274, Precision: 0.49813123503740275, Recall: 0.49830508474
576274, F1-score: 0.4979101104693679
```

```
Epoch 4/10 (Train): 100%|██████████| 1
17/117 [00:10<00:00, 11.12sample/s]
Epoch 4/10 (Eval): 100%|██████████| 1
71/71 [00:03<00:00, 20.74sample/s]
```

Epoch 4/10, Training Loss: 0.7230568197379816, Validation Loss: 0.7332597845523371  
Accuracy: 0.5112994350282486, Precision: 0.5269147464573944, Recall: 0.5112994350282486, F1-score: 0.4098002947333999

Epoch 5/10 (Train): 100% | ██████████ | 1  
17/117 [00:10<00:00, 11.22sample/s]

Epoch 5/10 (Eval): 100% | ██████████ |  
71/71 [00:03<00:00, 20.54sample/s]

Epoch 5/10, Training Loss: 0.7227402139979949, Validation Loss: 0.6922876851706855  
Accuracy: 0.5259887005649717, Precision: 0.5260452667232329, Recall: 0.5259887005649717, F1-score: 0.5234616447318211

Epoch 6/10 (Train): 100% | ██████████ | 1  
17/117 [00:10<00:00, 10.69sample/s]

Epoch 6/10 (Eval): 100% | ██████████ |  
71/71 [00:03<00:00, 20.17sample/s]

Epoch 6/10, Training Loss: 0.7225084748259935, Validation Loss: 0.9279878784370961  
Accuracy: 0.4966101694915254, Precision: 0.2466216604424016, Recall: 0.4966101694915254, F1-score: 0.329573679866403

Epoch 7/10 (Train): 100% | ██████████ | 1  
17/117 [00:10<00:00, 10.68sample/s]

Epoch 7/10 (Eval): 100% | ██████████ |  
71/71 [00:03<00:00, 20.37sample/s]

Epoch 7/10, Training Loss: 0.7293583095278527, Validation Loss: 0.7240362938514537  
Accuracy: 0.5028248587570622, Precision: 0.5005855722864478, Recall: 0.5028248587570622, F1-score: 0.4176680805869504

Epoch 8/10 (Train): 100% | ██████████ | 1  
17/117 [00:10<00:00, 10.73sample/s]

Epoch 8/10 (Eval): 100% | ██████████ |  
71/71 [00:03<00:00, 20.01sample/s]

Epoch 00008: reducing learning rate of group 0 to 1.0000e-04.

Epoch 8/10, Training Loss: 0.7375026521404174, Validation Loss: 0.6937961906699811  
Accuracy: 0.5231638418079096, Precision: 0.5230646560560216, Recall: 0.5231638418079096, F1-score: 0.5219328572461994

Epoch 9/10 (Train): 100% | ██████████ | 1  
17/117 [00:10<00:00, 10.71sample/s]

Epoch 9/10 (Eval): 100% | ██████████ |  
71/71 [00:03<00:00, 20.97sample/s]

Epoch 9/10, Training Loss: 0.6965532851792693, Validation Loss: 0.6973016632478789  
Accuracy: 0.5271186440677966, Precision: 0.5272412126722483, Recall: 0.5271186440677966, F1-score: 0.524272499199756

Epoch 10/10 (Train): 100% | ██████████ | 1  
17/117 [00:10<00:00, 10.94sample/s]

Epoch 10/10 (Eval): 100% | ██████████ |  
71/71 [00:03<00:00, 20.34sample/s]

Epoch 10/10, Training Loss: 0.7019776593368897, Validation Loss: 0.6984165576891711  
Accuracy: 0.5152542372881356, Precision: 0.5192573364324777, Recall: 0.5152542372881356, F1-score: 0.4978260050366443

Тренировка завершена!

Test: 100% | ██████████ |  
72/72 [00:03<00:00, 18.37sample/s]

```
Test Accuracy: 0.5206243032329989
Precision: 0.522441396620063, Recall: 0.5206243032329989, F1-score: 0.50197075637323
39
Accuracy of cats : 32 %
Accuracy of dogs : 71 %
```

```
Class_name: cats
```

```
Train_count: 900
```

```
Test_count: 300
```

```
Valid_count: 300
```

```
Shutil images: 100%|██████████| 150
0/1500 [00:00<00:00, 1738.09image/s]
```

```
Class_name: dogs
```

```
Train_count: 900
```

```
Test_count: 300
```

```
Valid_count: 300
```

```
Shutil images: 100%|██████████| 150
0/1500 [00:00<00:00, 1776.52image/s]
```

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```

Выбранная модель: resnext101\_64x4d

Пользовательское название модели: resnext101\_64x4d\_Exp2

Выбранный оптимизатор: SGD

```
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```

```
Epoch 1/10 (Train): 100%|██████████| 1
17/117 [00:23<00:00, 5.06sample/s]
```

```
Epoch 1/10 (Eval): 100%|██████████| 1
71/71 [00:05<00:00, 13.14sample/s]
```

Epoch 1/10, Training Loss: 0.7359484263097298, Validation Loss: 0.7272845301250953  
Accuracy: 0.5214689265536723, Precision: 0.522088979376443, Recall: 0.5214689265536723, F1-score: 0.5202066428227774

```
Epoch 2/10 (Train): 100%|██████████| 1
17/117 [00:22<00:00, 5.13sample/s]
```

```
Epoch 2/10 (Eval): 100%|██████████| 1
71/71 [00:05<00:00, 12.64sample/s]
```

Epoch 2/10, Training Loss: 0.7374026369802731, Validation Loss: 1.0498202461644082  
Accuracy: 0.49830508474576274, Precision: 0.6066016681339177, Recall: 0.49830508474576274, F1-score: 0.33530069529848466

```
Epoch 3/10 (Train): 100%|██████████| 1
17/117 [00:22<00:00, 5.18sample/s]
```

```
Epoch 3/10 (Eval): 100%|██████████| 1
71/71 [00:05<00:00, 13.07sample/s]
```

Epoch 3/10, Training Loss: 0.7316729855496449, Validation Loss: 0.8818125145583503  
Accuracy: 0.5022598870056497, Precision: 0.48370878425899927, Recall: 0.5022598870056497, F1-score: 0.349191730524904

```
Epoch 4/10 (Train): 100%|██████████| 1
17/117 [00:22<00:00, 5.20sample/s]
```

```
Epoch 4/10 (Eval): 100%|██████████| 1
71/71 [00:05<00:00, 13.15sample/s]
```

Epoch 00004: reducing learning rate of group 0 to 1.0000e-04.

Epoch 4/10, Training Loss: 0.7335274558501554, Validation Loss: 0.7828679759118516  
Accuracy: 0.5056497175141242, Precision: 0.5207397749770631, Recall: 0.5056497175141  
242, F1-score: 0.36530647113295356

Epoch 5/10 (Train): 100% | 1  
17/117 [00:22<00:00, 5.18sample/s]  
Epoch 5/10 (Eval): 100% |  
71/71 [00:05<00:00, 13.12sample/s]

Epoch 5/10, Training Loss: 0.7016424033854836, Validation Loss: 0.6868476477046471  
Accuracy: 0.5615819209039548, Precision: 0.5674140824626922, Recall: 0.5615819209039  
548, F1-score: 0.5536590799031477

Epoch 6/10 (Train): 100% | 1  
17/117 [00:22<00:00, 5.14sample/s]  
Epoch 6/10 (Eval): 100% |  
71/71 [00:05<00:00, 13.04sample/s]

Epoch 6/10, Training Loss: 0.6963406855502898, Validation Loss: 0.6986765880032447  
Accuracy: 0.5310734463276836, Precision: 0.5360219238638527, Recall: 0.5310734463276  
836, F1-score: 0.5185216587918354

Epoch 7/10 (Train): 100% | 1  
17/117 [00:22<00:00, 5.15sample/s]  
Epoch 7/10 (Eval): 100% |  
71/71 [00:05<00:00, 12.98sample/s]

Epoch 7/10, Training Loss: 0.7000529059429759, Validation Loss: 0.6963679990862722  
Accuracy: 0.5559322033898305, Precision: 0.5633945257680942, Recall: 0.5559322033898  
305, F1-score: 0.5447179859505342

Epoch 8/10 (Train): 100% | 1  
17/117 [00:22<00:00, 5.15sample/s]  
Epoch 8/10 (Eval): 100% |  
71/71 [00:05<00:00, 13.08sample/s]

Epoch 00008: reducing learning rate of group 0 to 1.0000e-05.

Epoch 8/10, Training Loss: 0.6957963512525526, Validation Loss: 0.6963093787600092  
Accuracy: 0.5468926553672316, Precision: 0.5597788515608123, Recall: 0.5468926553672  
316, F1-score: 0.5245526127902813

Epoch 9/10 (Train): 100% | 1  
17/117 [00:22<00:00, 5.10sample/s]  
Epoch 9/10 (Eval): 100% |  
71/71 [00:05<00:00, 12.88sample/s]

Epoch 9/10, Training Loss: 0.6940685532142207, Validation Loss: 0.6960893498975679  
Accuracy: 0.5338983050847458, Precision: 0.543551260571704, Recall: 0.53389830508474  
58, F1-score: 0.511292425453169

Epoch 10/10 (Train): 100% | 1  
17/117 [00:22<00:00, 5.11sample/s]  
Epoch 10/10 (Eval): 100% |  
71/71 [00:05<00:00, 13.00sample/s]

Epoch 10/10, Training Loss: 0.6960003325824475, Validation Loss: 0.6995753959073858  
Accuracy: 0.5412429378531074, Precision: 0.5511144608372479, Recall: 0.5412429378531  
074, F1-score: 0.5217083074120044

Тренировка завершена!

Test: 100% |  
72/72 [00:05<00:00, 12.28sample/s]

```
Test Accuracy: 0.544593088071349
Precision: 0.5507747447587312, Recall: 0.544593088071349, F1-score: 0.52633660029983
39
Accuracy of cats : 34 %
Accuracy of dogs : 73 %
```

```
Class_name: cats
```

```
Train_count: 900
```

```
Test_count: 300
```

```
Valid_count: 300
```

```
Shutil images: 100%|██████████| 150
0/1500 [00:00<00:00, 1801.55image/s]
```

```
Class_name: dogs
```

```
Train_count: 900
```

```
Test_count: 300
```

```
Valid_count: 300
```

```
Shutil images: 100%|██████████| 150
0/1500 [00:00<00:00, 1768.06image/s]
```

---

```
-----
```

Выбранная модель: resnext50\_32x4d

Пользовательское название модели: resnext50\_32x4d\_Exp2

Выбранный оптимизатор: SGD

```
-----
```

```
Epoch 1/10 (Train): 100%|██████████| 1
17/117 [00:11<00:00, 9.82sample/s]
Epoch 1/10 (Eval): 100%|██████████| 1
71/71 [00:03<00:00, 20.04sample/s]
```

```
Epoch 1/10, Training Loss: 0.7395662473853921, Validation Loss: 0.8155602032350282
Accuracy: 0.5067796610169492, Precision: 0.6089964811066313, Recall: 0.5067796610169492, F1-score: 0.3484904632671514
```

```
Epoch 2/10 (Train): 100%|██████████| 1
17/117 [00:11<00:00, 9.80sample/s]
Epoch 2/10 (Eval): 100%|██████████| 1
71/71 [00:03<00:00, 20.06sample/s]
```

```
Epoch 2/10, Training Loss: 0.7410138963219226, Validation Loss: 0.7069249856943465
Accuracy: 0.5141242937853108, Precision: 0.5139461530447438, Recall: 0.5141242937853108, F1-score: 0.5131349771841001
```

```
Epoch 3/10 (Train): 100%|██████████| 1
17/117 [00:11<00:00, 9.86sample/s]
Epoch 3/10 (Eval): 100%|██████████| 1
71/71 [00:03<00:00, 20.03sample/s]
```

```
Epoch 3/10, Training Loss: 0.7214991384765127, Validation Loss: 0.8313399333569963
Accuracy: 0.49887005649717514, Precision: 0.7505700904082769, Recall: 0.49887005649717514, F1-score: 0.3345716638722668
```

```
Epoch 4/10 (Train): 100%|██████████| 1
17/117 [00:11<00:00, 9.94sample/s]
Epoch 4/10 (Eval): 100%|██████████| 1
71/71 [00:03<00:00, 19.77sample/s]
```

Epoch 4/10, Training Loss: 0.7274558372104291, Validation Loss: 0.7132719404953348  
Accuracy: 0.5112994350282486, Precision: 0.511539054821768, Recall: 0.5112994350282486, F1-score: 0.5109602871348295

Epoch 5/10 (Train): 100% | ██████████ | 1  
17/117 [00:11<00:00, 9.87sample/s]  
Epoch 5/10 (Eval): 100% | ██████████ |  
71/71 [00:03<00:00, 19.98sample/s]

Epoch 00005: reducing learning rate of group 0 to 1.0000e-04.

Epoch 5/10, Training Loss: 0.7217235729047113, Validation Loss: 0.8427972018634532  
Accuracy: 0.5028248587570622, Precision: 0.253260005173851, Recall: 0.5028248587570622, F1-score: 0.33685484898687396

Epoch 6/10 (Train): 100% | ██████████ | 1  
17/117 [00:11<00:00, 9.90sample/s]  
Epoch 6/10 (Eval): 100% | ██████████ |  
71/71 [00:03<00:00, 20.03sample/s]

Epoch 6/10, Training Loss: 0.7141289913777223, Validation Loss: 0.7036060165550749  
Accuracy: 0.5107344632768361, Precision: 0.5140310089447824, Recall: 0.5107344632768361, F1-score: 0.49292214468012513

Epoch 7/10 (Train): 100% | ██████████ | 1  
17/117 [00:11<00:00, 9.94sample/s]  
Epoch 7/10 (Eval): 100% | ██████████ |  
71/71 [00:03<00:00, 20.03sample/s]

Epoch 7/10, Training Loss: 0.7064273538663215, Validation Loss: 0.7009373655763723  
Accuracy: 0.5112994350282486, Precision: 0.5115605690154525, Recall: 0.5112994350282486, F1-score: 0.5108990623052391

Epoch 8/10 (Train): 100% | ██████████ | 1  
17/117 [00:11<00:00, 9.90sample/s]  
Epoch 8/10 (Eval): 100% | ██████████ |  
71/71 [00:03<00:00, 20.03sample/s]

Epoch 8/10, Training Loss: 0.7048016662655008, Validation Loss: 0.7000416177140791  
Accuracy: 0.523728813559322, Precision: 0.5242442553568581, Recall: 0.523728813559322, F1-score: 0.5228315013397831

Epoch 9/10 (Train): 100% | ██████████ | 1  
17/117 [00:11<00:00, 9.87sample/s]  
Epoch 9/10 (Eval): 100% | ██████████ |  
71/71 [00:03<00:00, 19.54sample/s]

Epoch 9/10, Training Loss: 0.6998105477221643, Validation Loss: 0.6939089109668624  
Accuracy: 0.5333333333333333, Precision: 0.5335209924037172, Recall: 0.5333333333333333, F1-score: 0.5309606621909462

Epoch 10/10 (Train): 100% | ██████████ | 1  
17/117 [00:11<00:00, 9.90sample/s]  
Epoch 10/10 (Eval): 100% | ██████████ |  
71/71 [00:03<00:00, 20.17sample/s]

Epoch 10/10, Training Loss: 0.698872748928791, Validation Loss: 0.696500680877664  
Accuracy: 0.536723163841808, Precision: 0.5373112727689084, Recall: 0.536723163841808, F1-score: 0.5359175360811178

Тренировка завершена!

Test: 100% | ██████████ |  
72/72 [00:04<00:00, 17.65sample/s]

```
Test Accuracy: 0.5351170568561873
Precision: 0.5350516056098924, Recall: 0.5351170568561873, F1-score: 0.5342206011334
475
Accuracy of cats : 49 %
Accuracy of dogs : 57 %
```

```
Class_name: cats
```

```
Train_count: 900
```

```
Test_count: 300
```

```
Valid_count: 300
```

```
Shutil images: 100%|██████████| 150
0/1500 [00:00<00:00, 1809.69image/s]
```

```
Class_name: dogs
```

```
Train_count: 900
```

```
Test_count: 300
```

```
Valid_count: 300
```

```
Shutil images: 100%|██████████| 150
0/1500 [00:00<00:00, 1813.57image/s]
```

---

```
-----
```

Выбранная модель: shufflenet\_v2\_x0\_5

Пользовательское название модели: shufflenet\_v2\_x0\_5\_Exp2

Выбранный оптимизатор: AdamW

---

```
Epoch 1/10 (Train): 100%|██████████| 1
17/117 [00:12<00:00, 9.68sample/s]
Epoch 1/10 (Eval): 100%|██████████| 1
71/71 [00:03<00:00, 22.47sample/s]
```

```
Epoch 1/10, Training Loss: 0.7254883222973224, Validation Loss: 0.6925357509467561
Accuracy: 0.535593220338983, Precision: 0.5355479037062263, Recall: 0.53559322033898
3, F1-score: 0.535526794243242
```

```
Epoch 2/10 (Train): 100%|██████████| 1
17/117 [00:11<00:00, 9.94sample/s]
Epoch 2/10 (Eval): 100%|██████████| 1
71/71 [00:03<00:00, 22.63sample/s]
```

```
Epoch 2/10, Training Loss: 0.7189739336262864, Validation Loss: 0.724422333267449
Accuracy: 0.515819209039548, Precision: 0.5632199387720148, Recall: 0.51581920903954
8, F1-score: 0.3945370764777331
```

```
Epoch 3/10 (Train): 100%|██████████| 1
17/117 [00:11<00:00, 9.83sample/s]
Epoch 3/10 (Eval): 100%|██████████| 1
71/71 [00:03<00:00, 22.53sample/s]
```

```
Epoch 3/10, Training Loss: 0.7139188591966924, Validation Loss: 0.6829131530166346
Accuracy: 0.5610169491525424, Precision: 0.5636939583659156, Recall: 0.5610169491525
424, F1-score: 0.5548098119404169
```

```
Epoch 4/10 (Train): 100%|██████████| 1
17/117 [00:11<00:00, 9.94sample/s]
Epoch 4/10 (Eval): 100%|██████████| 1
71/71 [00:03<00:00, 22.50sample/s]
```

Epoch 4/10, Training Loss: 0.7005047727491438, Validation Loss: 0.685928480436573  
Accuracy: 0.5485875706214689, Precision: 0.5803333581255629, Recall: 0.5485875706214689, F1-score: 0.49478468984043816

Epoch 5/10 (Train): 100% | [██████████] | 1  
17/117 [00:11<00:00, 10.04sample/s]

Epoch 5/10 (Eval): 100% | [██████████] |  
71/71 [00:03<00:00, 22.55sample/s]

Epoch 5/10, Training Loss: 0.6939385636770439, Validation Loss: 0.6876897702446092  
Accuracy: 0.5310734463276836, Precision: 0.6250969613681476, Recall: 0.5310734463276836, F1-score: 0.4176475069238637

Epoch 6/10 (Train): 100% | [██████████] | 1  
17/117 [00:11<00:00, 10.03sample/s]

Epoch 6/10 (Eval): 100% | [██████████] |  
71/71 [00:03<00:00, 22.58sample/s]

Epoch 00006: reducing learning rate of group 0 to 1.0000e-04.

Epoch 6/10, Training Loss: 0.6968127547465649, Validation Loss: 0.6908554937374793  
Accuracy: 0.5152542372881356, Precision: 0.5850931572528073, Recall: 0.5152542372881356, F1-score: 0.3822572536627406

Epoch 7/10 (Train): 100% | [██████████] | 1  
17/117 [00:11<00:00, 9.90sample/s]

Epoch 7/10 (Eval): 100% | [██████████] |  
71/71 [00:03<00:00, 22.55sample/s]

Epoch 7/10, Training Loss: 0.6768098792054809, Validation Loss: 0.6638418260940724  
Accuracy: 0.6129943502824858, Precision: 0.6231299195326309, Recall: 0.6129943502824858, F1-score: 0.6038390784748077

Epoch 8/10 (Train): 100% | [██████████] | 1  
17/117 [00:11<00:00, 10.02sample/s]

Epoch 8/10 (Eval): 100% | [██████████] |  
71/71 [00:03<00:00, 22.79sample/s]

Epoch 8/10, Training Loss: 0.6734051596872586, Validation Loss: 0.6632383303285319  
Accuracy: 0.5870056497175141, Precision: 0.6229722114424476, Recall: 0.5870056497175141, F1-score: 0.5522045016727324

Epoch 9/10 (Train): 100% | [██████████] | 1  
17/117 [00:11<00:00, 9.99sample/s]

Epoch 9/10 (Eval): 100% | [██████████] |  
71/71 [00:03<00:00, 22.59sample/s]

Epoch 9/10, Training Loss: 0.6669355344116893, Validation Loss: 0.6488708038788057  
Accuracy: 0.6418079096045197, Precision: 0.642012648298655, Recall: 0.6418079096045197, F1-score: 0.641548362060182

Epoch 10/10 (Train): 100% | [██████████] | 1  
17/117 [00:11<00:00, 9.99sample/s]

Epoch 10/10 (Eval): 100% | [██████████] |  
71/71 [00:03<00:00, 22.86sample/s]

Epoch 10/10, Training Loss: 0.6611422480586469, Validation Loss: 0.6444847984502544  
Accuracy: 0.6367231638418079, Precision: 0.6527198808978469, Recall: 0.6367231638418079, F1-score: 0.6260437002246273

Тренировка завершена!

Test: 100% | [██████████] |  
72/72 [00:03<00:00, 20.82sample/s]

```
Test Accuracy: 0.624860646599777  
Precision: 0.6477000141806943, Recall: 0.624860646599777, F1-score: 0.61108105158179  
19  
Accuracy of cats : 81 %  
Accuracy of dogs : 43 %
```

```
Class_name: cats  
Train_count: 900  
Test_count: 300  
Valid_count: 300
```

```
Shutil images: 100%|██████████| 150  
0/1500 [00:00<00:00, 1887.60image/s]
```

```
Class_name: dogs  
Train_count: 900  
Test_count: 300  
Valid_count: 300
```

```
Shutil images: 100%|██████████| 150  
0/1500 [00:00<00:00, 1864.29image/s]
```

---

```
-----  
Выбранная модель: shufflenet_v2_x1_0  
Пользовательское название модели: shufflenet_v2_x1_0_Exp2  
Выбранный оптимизатор: AdamW  
-----
```

```
Epoch 1/10 (Train): 100%|██████████| 1  
17/117 [00:11<00:00, 9.88sample/s]  
Epoch 1/10 (Eval): 100%|██████████| 1  
71/71 [00:03<00:00, 22.66sample/s]
```

```
Epoch 1/10, Training Loss: 0.7408177376407938, Validation Loss: 0.6983024225396625  
Accuracy: 0.5327683615819209, Precision: 0.55722051482701, Recall: 0.5327683615819209, F1-score: 0.4827537550437681
```

```
Epoch 2/10 (Train): 100%|██████████| 1  
17/117 [00:11<00:00, 9.96sample/s]  
Epoch 2/10 (Eval): 100%|██████████| 1  
71/71 [00:03<00:00, 22.43sample/s]
```

```
Epoch 2/10, Training Loss: 0.7069699944499432, Validation Loss: 0.6650916923910885  
Accuracy: 0.6112994350282486, Precision: 0.6156613876235499, Recall: 0.6112994350282486, F1-score: 0.6068654870522366
```

```
Epoch 3/10 (Train): 100%|██████████| 1  
17/117 [00:11<00:00, 9.94sample/s]  
Epoch 3/10 (Eval): 100%|██████████| 1  
71/71 [00:03<00:00, 22.46sample/s]
```

```
Epoch 3/10, Training Loss: 0.6939665886135036, Validation Loss: 0.661952395392003  
Accuracy: 0.5909604519774011, Precision: 0.6615555407099588, Recall: 0.5909604519774011, F1-score: 0.5385212256920476
```

```
Epoch 4/10 (Train): 100%|██████████| 1  
17/117 [00:11<00:00, 9.84sample/s]  
Epoch 4/10 (Eval): 100%|██████████| 1  
71/71 [00:03<00:00, 22.38sample/s]
```

Epoch 4/10, Training Loss: 0.6672505476220777, Validation Loss: 0.632167416693127  
Accuracy: 0.6632768361581921, Precision: 0.6706183735955386, Recall: 0.6632768361581921, F1-score: 0.6600728445729772

Epoch 5/10 (Train): 100% | [██████████] | 1  
17/117 [00:12<00:00, 9.58sample/s]

Epoch 5/10 (Eval): 100% | [██████████] |  
71/71 [00:03<00:00, 19.38sample/s]

Epoch 5/10, Training Loss: 0.6517140391663587, Validation Loss: 0.5914628320494614  
Accuracy: 0.6875706214689266, Precision: 0.6908549532085172, Recall: 0.6875706214689266, F1-score: 0.6859566293545238

Epoch 6/10 (Train): 100% | [██████████] | 1  
17/117 [00:14<00:00, 7.94sample/s]

Epoch 6/10 (Eval): 100% | [██████████] |  
71/71 [00:03<00:00, 19.95sample/s]

Epoch 6/10, Training Loss: 0.6538150577815538, Validation Loss: 0.6191981294229205  
Accuracy: 0.6531073446327683, Precision: 0.7280861708555386, Recall: 0.6531073446327683, F1-score: 0.6208219138730942

Epoch 7/10 (Train): 100% | [██████████] | 1  
17/117 [00:12<00:00, 9.26sample/s]

Epoch 7/10 (Eval): 100% | [██████████] |  
71/71 [00:03<00:00, 21.07sample/s]

Epoch 7/10, Training Loss: 0.6310357886184123, Validation Loss: 0.5764907662477871  
Accuracy: 0.707909604519774, Precision: 0.7174312208302627, Recall: 0.707909604519774, F1-score: 0.7043214959920435

Epoch 8/10 (Train): 100% | [██████████] | 1  
17/117 [00:12<00:00, 9.40sample/s]

Epoch 8/10 (Eval): 100% | [██████████] |  
71/71 [00:03<00:00, 22.02sample/s]

Epoch 8/10, Training Loss: 0.6103270704701185, Validation Loss: 0.5697174225065668  
Accuracy: 0.6858757062146893, Precision: 0.7672318108935352, Recall: 0.6858757062146893, F1-score: 0.6590547818268214

Epoch 9/10 (Train): 100% | [██████████] | 1  
17/117 [00:11<00:00, 9.79sample/s]

Epoch 9/10 (Eval): 100% | [██████████] |  
71/71 [00:03<00:00, 21.79sample/s]

Epoch 9/10, Training Loss: 0.6060830695727437, Validation Loss: 0.4957368351982138  
Accuracy: 0.7745762711864407, Precision: 0.7766906042877657, Recall: 0.7745762711864407, F1-score: 0.7742358587201242

Epoch 10/10 (Train): 100% | [██████████] | 1  
17/117 [00:11<00:00, 9.76sample/s]

Epoch 10/10 (Eval): 100% | [██████████] |  
71/71 [00:03<00:00, 21.68sample/s]

Epoch 10/10, Training Loss: 0.5852062988936696, Validation Loss: 0.5185669681615075  
Accuracy: 0.7621468926553673, Precision: 0.7795501956385081, Recall: 0.7621468926553673, F1-score: 0.7580968574533411

Тренировка завершена!

Test: 100% | [██████████] |  
72/72 [00:03<00:00, 19.43sample/s]

```
Test Accuracy: 0.7586399108138239
Precision: 0.7781455429963912, Recall: 0.7586399108138239, F1-score: 0.7546851354460
297
Accuracy of cats : 88 %
Accuracy of dogs : 63 %
```

```
Class_name: cats
```

```
Train_count: 900
```

```
Test_count: 300
```

```
Valid_count: 300
```

```
Shutil images: 100%|██████████| 150
0/1500 [00:00<00:00, 1810.50image/s]
```

```
Class_name: dogs
```

```
Train_count: 900
```

```
Test_count: 300
```

```
Valid_count: 300
```

```
Shutil images: 100%|██████████| 150
0/1500 [00:00<00:00, 1825.78image/s]
```

---

```
Выбранная модель: shufflenet_v2_x1_5
```

```
Пользовательское название модели: shufflenet_v2_x1_5_Exp2
```

```
Выбранный оптимизатор: AdamW
```

---

```
Epoch 1/10 (Train): 100%|██████████| 1
17/117 [00:12<00:00, 9.43sample/s]
```

```
Epoch 1/10 (Eval): 100%|██████████| 1
71/71 [00:03<00:00, 20.35sample/s]
```

```
Epoch 1/10, Training Loss: 0.7275803649855643, Validation Loss: 0.6902893939092334
Accuracy: 0.5497175141242938, Precision: 0.6058677187353066, Recall: 0.5497175141242
938, F1-score: 0.4848181098297793
```

```
Epoch 2/10 (Train): 100%|██████████| 1
17/117 [00:12<00:00, 9.59sample/s]
```

```
Epoch 2/10 (Eval): 100%|██████████| 1
71/71 [00:03<00:00, 22.40sample/s]
```

```
Epoch 2/10, Training Loss: 0.6871405564427785, Validation Loss: 0.6472441005167988
Accuracy: 0.6129943502824858, Precision: 0.6958421538106768, Recall: 0.6129943502824
858, F1-score: 0.565419924230937
```

```
Epoch 3/10 (Train): 100%|██████████| 1
17/117 [00:11<00:00, 9.92sample/s]
```

```
Epoch 3/10 (Eval): 100%|██████████| 1
71/71 [00:03<00:00, 21.54sample/s]
```

```
Epoch 3/10, Training Loss: 0.6722009174295307, Validation Loss: 0.6279469202298903
Accuracy: 0.6649717514124294, Precision: 0.6941835831478933, Recall: 0.6649717514124
294, F1-score: 0.6526983732337628
```

```
Epoch 4/10 (Train): 100%|██████████| 1
17/117 [00:12<00:00, 9.68sample/s]
```

```
Epoch 4/10 (Eval): 100%|██████████| 1
71/71 [00:03<00:00, 22.37sample/s]
```

Epoch 4/10, Training Loss: 0.6487512315056988, Validation Loss: 0.5722244097351354  
Accuracy: 0.7169491525423729, Precision: 0.721782531362539, Recall: 0.7169491525423729, F1-score: 0.7156240280896274

Epoch 5/10 (Train): 100% | [██████████] | 1  
17/117 [00:11<00:00, 9.81sample/s]

Epoch 5/10 (Eval): 100% | [██████████] |  
71/71 [00:03<00:00, 22.28sample/s]

Epoch 5/10, Training Loss: 0.6177061654345686, Validation Loss: 0.521852917169447  
Accuracy: 0.7418079096045198, Precision: 0.7590627807934222, Recall: 0.7418079096045198, F1-score: 0.7370929456683467

Epoch 6/10 (Train): 100% | [██████████] | 1  
17/117 [00:12<00:00, 9.26sample/s]

Epoch 6/10 (Eval): 100% | [██████████] |  
71/71 [00:03<00:00, 21.87sample/s]

Epoch 6/10, Training Loss: 0.6007303178720048, Validation Loss: 0.5810774482239438  
Accuracy: 0.7, Precision: 0.7462464985994397, Recall: 0.7, F1-score: 0.6859258013460632

Epoch 7/10 (Train): 100% | [██████████] | 1  
17/117 [00:12<00:00, 9.63sample/s]

Epoch 7/10 (Eval): 100% | [██████████] |  
71/71 [00:03<00:00, 22.22sample/s]

Epoch 7/10, Training Loss: 0.5804556042365602, Validation Loss: 0.5132596954955893  
Accuracy: 0.768361581920904, Precision: 0.7764796210280229, Recall: 0.768361581920904, F1-score: 0.7664546741774224

Epoch 8/10 (Train): 100% | [██████████] | 1  
17/117 [00:12<00:00, 9.42sample/s]

Epoch 8/10 (Eval): 100% | [██████████] |  
71/71 [00:03<00:00, 23.01sample/s]

Epoch 8/10, Training Loss: 0.5960310805601763, Validation Loss: 0.47344827348903074  
Accuracy: 0.8084745762711865, Precision: 0.808684310832166, Recall: 0.8084745762711865, F1-score: 0.8084180029794167

Epoch 9/10 (Train): 100% | [██████████] | 1  
17/117 [00:12<00:00, 9.24sample/s]

Epoch 9/10 (Eval): 100% | [██████████] |  
71/71 [00:03<00:00, 20.85sample/s]

Epoch 9/10, Training Loss: 0.547547578709232, Validation Loss: 0.4360180721528786  
Accuracy: 0.8231638418079096, Precision: 0.8266501177594259, Recall: 0.8231638418079096, F1-score: 0.822610711050033

Epoch 10/10 (Train): 100% | [██████████] | 1  
17/117 [00:12<00:00, 9.10sample/s]

Epoch 10/10 (Eval): 100% | [██████████] |  
71/71 [00:03<00:00, 20.87sample/s]

Epoch 10/10, Training Loss: 0.5573337745318299, Validation Loss: 0.4382321735223134  
Accuracy: 0.827683615819209, Precision: 0.8305561440677965, Recall: 0.827683615819209, F1-score: 0.8273757406668624

Тренировка завершена!

Test: 100% | [██████████] |  
72/72 [00:03<00:00, 18.90sample/s]

```
Test Accuracy: 0.8244147157190636
Precision: 0.8279542031251083, Recall: 0.8244147157190636, F1-score: 0.8238476942213
1
Accuracy of cats : 76 %
Accuracy of dogs : 87 %
```

```
Class_name: cats
```

```
Train_count: 900
```

```
Test_count: 300
```

```
Valid_count: 300
```

```
Shutil images: 100%|██████████| 150
0/1500 [00:00<00:00, 1893.58image/s]
```

```
Class_name: dogs
```

```
Train_count: 900
```

```
Test_count: 300
```

```
Valid_count: 300
```

```
Shutil images: 100%|██████████| 150
0/1500 [00:00<00:00, 1791.24image/s]
```

---

```
Выбранная модель: shufflenet_v2_x2_0
```

```
Пользовательское название модели: shufflenet_v2_x2_0_Exp2
```

```
Выбранный оптимизатор: AdamW
```

---

```
Epoch 1/10 (Train): 100%|██████████| 1
17/117 [00:12<00:00, 9.41sample/s]
```

```
Epoch 1/10 (Eval): 100%|██████████| 1
71/71 [00:03<00:00, 20.58sample/s]
```

```
Epoch 1/10, Training Loss: 0.7818373362837788, Validation Loss: 0.6694855243809479
Accuracy: 0.5694915254237288, Precision: 0.6259043600036523, Recall: 0.5694915254237288,
F1-score: 0.5121810434321343
```

```
Epoch 2/10 (Train): 100%|██████████| 1
17/117 [00:12<00:00, 9.07sample/s]
```

```
Epoch 2/10 (Eval): 100%|██████████| 1
71/71 [00:03<00:00, 20.29sample/s]
```

```
Epoch 2/10, Training Loss: 0.6892301994295874, Validation Loss: 0.5868471929077375
Accuracy: 0.6949152542372882, Precision: 0.70726470729754, Recall: 0.6949152542372882,
F1-score: 0.6907329032979306
```

```
Epoch 3/10 (Train): 100%|██████████| 1
17/117 [00:12<00:00, 9.67sample/s]
```

```
Epoch 3/10 (Eval): 100%|██████████| 1
71/71 [00:03<00:00, 20.63sample/s]
```

```
Epoch 3/10, Training Loss: 0.6723110473033079, Validation Loss: 0.6207994846469265
Accuracy: 0.7220338983050848, Precision: 0.7373563794846172, Recall: 0.7220338983050848,
F1-score: 0.7170879401596207
```

```
Epoch 4/10 (Train): 100%|██████████| 1
17/117 [00:13<00:00, 8.95sample/s]
```

```
Epoch 4/10 (Eval): 100%|██████████| 1
71/71 [00:03<00:00, 21.00sample/s]
```

Epoch 4/10, Training Loss: 0.6442985593555719, Validation Loss: 0.57820005058232  
Accuracy: 0.7220338983050848, Precision: 0.7642705665649281, Recall: 0.7220338983050848, F1-score: 0.7098850827513163

Epoch 5/10 (Train): 100% | [██████████] | 1  
17/117 [00:11<00:00, 9.79sample/s]

Epoch 5/10 (Eval): 100% | [██████████] |  
71/71 [00:03<00:00, 20.42sample/s]

Epoch 5/10, Training Loss: 0.6076265445484739, Validation Loss: 0.48135274160379743  
Accuracy: 0.7977401129943503, Precision: 0.8075697836585299, Recall: 0.7977401129943503, F1-score: 0.7959464857612887

Epoch 6/10 (Train): 100% | [██████████] | 1  
17/117 [00:12<00:00, 9.40sample/s]

Epoch 6/10 (Eval): 100% | [██████████] |  
71/71 [00:03<00:00, 21.29sample/s]

Epoch 6/10, Training Loss: 0.5862973091221347, Validation Loss: 0.5020454996554865  
Accuracy: 0.772316384180791, Precision: 0.7874293999458878, Recall: 0.772316384180791, F1-score: 0.7690341009658702

Epoch 7/10 (Train): 100% | [██████████] | 1  
17/117 [00:12<00:00, 9.45sample/s]

Epoch 7/10 (Eval): 100% | [██████████] |  
71/71 [00:03<00:00, 20.89sample/s]

Epoch 7/10, Training Loss: 0.5642907366002958, Validation Loss: 0.4461560648376659  
Accuracy: 0.7932203389830509, Precision: 0.7936494699986005, Recall: 0.7932203389830509, F1-score: 0.793106202488199

Epoch 8/10 (Train): 100% | [██████████] | 1  
17/117 [00:11<00:00, 10.05sample/s]

Epoch 8/10 (Eval): 100% | [██████████] |  
71/71 [00:03<00:00, 21.39sample/s]

Epoch 8/10, Training Loss: 0.5617299373309637, Validation Loss: 0.5760649809729581  
Accuracy: 0.6802259887005649, Precision: 0.707756734136366, Recall: 0.6802259887005649, F1-score: 0.6685534898278673

Epoch 9/10 (Train): 100% | [██████████] | 1  
17/117 [00:11<00:00, 10.13sample/s]

Epoch 9/10 (Eval): 100% | [██████████] |  
71/71 [00:03<00:00, 21.04sample/s]

Epoch 9/10, Training Loss: 0.5528948945073328, Validation Loss: 0.420026018542085  
Accuracy: 0.8355932203389831, Precision: 0.8393900195963833, Recall: 0.8355932203389831, F1-score: 0.8350578299339264

Epoch 10/10 (Train): 100% | [██████████] | 1  
17/117 [00:11<00:00, 10.09sample/s]

Epoch 10/10 (Eval): 100% | [██████████] |  
71/71 [00:03<00:00, 21.25sample/s]

Epoch 10/10, Training Loss: 0.5245235834744378, Validation Loss: 0.39620387457353246  
Accuracy: 0.8502824858757062, Precision: 0.8587402561526826, Recall: 0.8502824858757062, F1-score: 0.8493000109992174

Тренировка завершена!

Test: 100% | [██████████] |  
72/72 [00:03<00:00, 18.02sample/s]

```
Test Accuracy: 0.855072463768116
Precision: 0.8614637496773242, Recall: 0.855072463768116, F1-score: 0.85451798701443
64
Accuracy of cats : 92 %
Accuracy of dogs : 79 %
```

```
Class_name: cats
```

```
Train_count: 900
```

```
Test_count: 300
```

```
Valid_count: 300
```

```
Shutil images: 100%|██████████| 150
0/1500 [00:00<00:00, 1728.34image/s]
```

```
Class_name: dogs
```

```
Train_count: 900
```

```
Test_count: 300
```

```
Valid_count: 300
```

```
Shutil images: 100%|██████████| 150
0/1500 [00:00<00:00, 1787.85image/s]
```

---

```
Выбранная модель: swin_b
```

```
Пользовательское название модели: swin_b_Exp2
```

```
Выбранный оптимизатор: SGD
```

---

```
Epoch 1/10 (Train): 100%|██████████| 1
17/117 [00:19<00:00, 5.92sample/s]
Epoch 1/10 (Eval): 100%|██████████| 1
71/71 [00:04<00:00, 14.47sample/s]
```

```
Epoch 1/10, Training Loss: 0.7135328924942672, Validation Loss: 0.6758842665260121
Accuracy: 0.5790960451977402, Precision: 0.5810291292930367, Recall: 0.5790960451977
402, F1-score: 0.5756746568235596
```

```
Epoch 2/10 (Train): 100%|██████████| 1
17/117 [00:19<00:00, 5.91sample/s]
Epoch 2/10 (Eval): 100%|██████████| 1
71/71 [00:04<00:00, 14.37sample/s]
```

```
Epoch 2/10, Training Loss: 0.6977162754412779, Validation Loss: 0.6632744991509928
Accuracy: 0.6073446327683616, Precision: 0.6123334998669681, Recall: 0.6073446327683
616, F1-score: 0.6021113361212064
```

```
Epoch 3/10 (Train): 100%|██████████| 1
17/117 [00:20<00:00, 5.72sample/s]
Epoch 3/10 (Eval): 100%|██████████| 1
71/71 [00:04<00:00, 14.31sample/s]
```

```
Epoch 3/10, Training Loss: 0.6939569696323159, Validation Loss: 0.6584344309265331
Accuracy: 0.6129943502824858, Precision: 0.6255860384946855, Recall: 0.6129943502824
858, F1-score: 0.6019286284506485
```

```
Epoch 4/10 (Train): 100%|██████████| 1
17/117 [00:19<00:00, 5.91sample/s]
Epoch 4/10 (Eval): 100%|██████████| 1
71/71 [00:05<00:00, 14.00sample/s]
```

Epoch 4/10, Training Loss: 0.6836255292097727, Validation Loss: 0.6465733921797262  
Accuracy: 0.615819209039548, Precision: 0.6160426371167427, Recall: 0.615819209039548, F1-score: 0.6154385957005802

Epoch 5/10 (Train): 100% | ██████████ | 1  
17/117 [00:20<00:00, 5.84sample/s]  
Epoch 5/10 (Eval): 100% | ██████████ |  
71/71 [00:04<00:00, 14.42sample/s]

Epoch 5/10, Training Loss: 0.6787540421043474, Validation Loss: 0.6505283922125391  
Accuracy: 0.6209039548022599, Precision: 0.6427010454460588, Recall: 0.6209039548022599, F1-score: 0.6046206474627972

Epoch 6/10 (Train): 100% | ██████████ | 1  
17/117 [00:20<00:00, 5.78sample/s]  
Epoch 6/10 (Eval): 100% | ██████████ |  
71/71 [00:04<00:00, 14.31sample/s]

Epoch 6/10, Training Loss: 0.6786812960691878, Validation Loss: 0.6420589486757914  
Accuracy: 0.6259887005649718, Precision: 0.6555655763539492, Recall: 0.6259887005649718, F1-score: 0.6060433388803862

Epoch 7/10 (Train): 100% | ██████████ | 1  
17/117 [00:20<00:00, 5.67sample/s]  
Epoch 7/10 (Eval): 100% | ██████████ |  
71/71 [00:04<00:00, 14.42sample/s]

Epoch 7/10, Training Loss: 0.6758919189271239, Validation Loss: 0.6554664817065169  
Accuracy: 0.6016949152542372, Precision: 0.6697491452464193, Recall: 0.6016949152542372, F1-score: 0.5553196316700351

Epoch 8/10 (Train): 100% | ██████████ | 1  
17/117 [00:20<00:00, 5.68sample/s]  
Epoch 8/10 (Eval): 100% | ██████████ |  
71/71 [00:05<00:00, 13.99sample/s]

Epoch 8/10, Training Loss: 0.6755467462785465, Validation Loss: 0.6291542703149009  
Accuracy: 0.6429378531073446, Precision: 0.6468785060082984, Recall: 0.6429378531073446, F1-score: 0.640946018392511

Epoch 9/10 (Train): 100% | ██████████ | 1  
17/117 [00:20<00:00, 5.68sample/s]  
Epoch 9/10 (Eval): 100% | ██████████ |  
71/71 [00:04<00:00, 14.40sample/s]

Epoch 9/10, Training Loss: 0.6693866882742066, Validation Loss: 0.6531203149233834  
Accuracy: 0.6005649717514124, Precision: 0.6729663815454048, Recall: 0.6005649717514124, F1-score: 0.551839122541721

Epoch 10/10 (Train): 100% | ██████████ | 1  
17/117 [00:20<00:00, 5.65sample/s]  
Epoch 10/10 (Eval): 100% | ██████████ |  
71/71 [00:05<00:00, 13.64sample/s]

Epoch 10/10, Training Loss: 0.6646194295170381, Validation Loss: 0.6134481406481253  
Accuracy: 0.6508474576271186, Precision: 0.6522487131229829, Recall: 0.6508474576271186, F1-score: 0.6497774378821587

Тренировка завершена!

Test: 100% | ██████████ |  
72/72 [00:05<00:00, 13.64sample/s]

```
Test Accuracy: 0.6471571906354515
Precision: 0.6495241537257953, Recall: 0.6471571906354515, F1-score: 0.6461069569104
512
Accuracy of cats : 70 %
Accuracy of dogs : 59 %
```

```
Class_name: cats
```

```
Train_count: 900
```

```
Test_count: 300
```

```
Valid_count: 300
```

```
Shutil images: 100%|██████████| 150
0/1500 [00:00<00:00, 1811.40image/s]
```

```
Class_name: dogs
```

```
Train_count: 900
```

```
Test_count: 300
```

```
Valid_count: 300
```

```
Shutil images: 100%|██████████| 150
0/1500 [00:00<00:00, 1664.52image/s]
```

---

```
-----
```

Выбранная модель: swin\_s

Пользовательское название модели: swin\_s\_Exp2

Выбранный оптимизатор: SGD

```
-----
```

```
Epoch 1/10 (Train): 100%|██████████| 1
17/117 [00:16<00:00, 7.09sample/s]
Epoch 1/10 (Eval): 100%|██████████| 1
71/71 [00:04<00:00, 17.08sample/s]
```

```
Epoch 1/10, Training Loss: 0.7044486243700244, Validation Loss: 0.6832598656584314
Accuracy: 0.5457627118644067, Precision: 0.5483834579383019, Recall: 0.5457627118644
067, F1-score: 0.541338373996874
```

```
Epoch 2/10 (Train): 100%|██████████| 1
17/117 [00:16<00:00, 7.18sample/s]
Epoch 2/10 (Eval): 100%|██████████| 1
71/71 [00:04<00:00, 17.11sample/s]
```

```
Epoch 2/10, Training Loss: 0.6902549480859357, Validation Loss: 0.6563661096796478
Accuracy: 0.6033898305084746, Precision: 0.6041126603088686, Recall: 0.6033898305084
746, F1-score: 0.602319605173292
```

```
Epoch 3/10 (Train): 100%|██████████| 1
17/117 [00:16<00:00, 7.05sample/s]
Epoch 3/10 (Eval): 100%|██████████| 1
71/71 [00:04<00:00, 17.16sample/s]
```

```
Epoch 3/10, Training Loss: 0.6843828977792943, Validation Loss: 0.6685626799777403
Accuracy: 0.5887005649717514, Precision: 0.6517088997035297, Recall: 0.5887005649717
514, F1-score: 0.5387205197030807
```

```
Epoch 4/10 (Train): 100%|██████████| 1
17/117 [00:16<00:00, 7.13sample/s]
Epoch 4/10 (Eval): 100%|██████████| 1
71/71 [00:04<00:00, 17.29sample/s]
```

Epoch 4/10, Training Loss: 0.6761333074971163, Validation Loss: 0.6421362915955021  
Accuracy: 0.6367231638418079, Precision: 0.6376520397037791, Recall: 0.6367231638418079, F1-score: 0.6358472532933982

Epoch 5/10 (Train): 100% | ██████████ | 1  
17/117 [00:17<00:00, 6.88sample/s]

Epoch 5/10 (Eval): 100% | ██████████ |  
71/71 [00:04<00:00, 16.30sample/s]

Epoch 5/10, Training Loss: 0.6787735129549741, Validation Loss: 0.6325838335153073  
Accuracy: 0.6502824858757063, Precision: 0.6514534543950427, Recall: 0.6502824858757063, F1-score: 0.6493593454203777

Epoch 6/10 (Train): 100% | ██████████ | 1  
17/117 [00:16<00:00, 6.94sample/s]

Epoch 6/10 (Eval): 100% | ██████████ |  
71/71 [00:04<00:00, 16.15sample/s]

Epoch 6/10, Training Loss: 0.6715296823339364, Validation Loss: 0.6350028261458133  
Accuracy: 0.6305084745762712, Precision: 0.6691021988575693, Recall: 0.6305084745762712, F1-score: 0.6068352720900342

Epoch 7/10 (Train): 100% | ██████████ | 1  
17/117 [00:16<00:00, 6.89sample/s]

Epoch 7/10 (Eval): 100% | ██████████ |  
71/71 [00:04<00:00, 16.23sample/s]

Epoch 7/10, Training Loss: 0.665621120085831, Validation Loss: 0.6233016286192641  
Accuracy: 0.6576271186440678, Precision: 0.6674300690530461, Recall: 0.6576271186440678, F1-score: 0.6519518083027814

Epoch 8/10 (Train): 100% | ██████████ | 1  
17/117 [00:17<00:00, 6.52sample/s]

Epoch 8/10 (Eval): 100% | ██████████ |  
71/71 [00:04<00:00, 15.93sample/s]

Epoch 8/10, Training Loss: 0.6647637881773854, Validation Loss: 0.6245809497132813  
Accuracy: 0.6559322033898305, Precision: 0.6559374649231114, Recall: 0.6559322033898305, F1-score: 0.6558877142934091

Epoch 9/10 (Train): 100% | ██████████ | 1  
17/117 [00:16<00:00, 6.89sample/s]

Epoch 9/10 (Eval): 100% | ██████████ |  
71/71 [00:04<00:00, 16.51sample/s]

Epoch 9/10, Training Loss: 0.657615260774737, Validation Loss: 0.6153301270836491  
Accuracy: 0.6677966101694915, Precision: 0.6689115779018161, Recall: 0.6677966101694915, F1-score: 0.667050300710771

Epoch 10/10 (Train): 100% | ██████████ | 1  
17/117 [00:17<00:00, 6.86sample/s]

Epoch 10/10 (Eval): 100% | ██████████ |  
71/71 [00:04<00:00, 16.18sample/s]

Epoch 10/10, Training Loss: 0.6555253074750867, Validation Loss: 0.6099015321098479  
Accuracy: 0.6779661016949152, Precision: 0.6805137636011822, Recall: 0.6779661016949152, F1-score: 0.6770592995048534

Тренировка завершена!

Test: 100% | ██████████ |  
72/72 [00:04<00:00, 15.32sample/s]

```
Test Accuracy: 0.6666666666666666  
Precision: 0.6688046932125661, Recall: 0.6666666666666666, F1-score: 0.6652956884524  
845  
Accuracy of cats : 60 %  
Accuracy of dogs : 72 %
```

```
Class_name: cats
```

```
Train_count: 900
```

```
Test_count: 300
```

```
Valid_count: 300
```

```
Shutil images: 100%|██████████| 150  
0/1500 [00:00<00:00, 1756.92image/s]
```

```
Class_name: dogs
```

```
Train_count: 900
```

```
Test_count: 300
```

```
Valid_count: 300
```

```
Shutil images: 100%|██████████| 150  
0/1500 [00:00<00:00, 1778.07image/s]
```

---

```
-----  
Выбранная модель: swin_t
```

```
Пользовательское название модели: swin_t_Exp2
```

```
Выбранный оптимизатор: SGD
```

---

```
Epoch 1/10 (Train): 100%|██████████| 1  
17/117 [00:12<00:00, 9.73sample/s]  
Epoch 1/10 (Eval): 100%|██████████| 1  
71/71 [00:03<00:00, 19.69sample/s]
```

```
Epoch 1/10, Training Loss: 0.7009894656356668, Validation Loss: 0.6910210273696877  
Accuracy: 0.5694915254237288, Precision: 0.5821055582067091, Recall: 0.5694915254237  
288, F1-score: 0.5500176817940311
```

```
Epoch 2/10 (Train): 100%|██████████| 1  
17/117 [00:11<00:00, 9.84sample/s]  
Epoch 2/10 (Eval): 100%|██████████| 1  
71/71 [00:03<00:00, 19.13sample/s]
```

```
Epoch 2/10, Training Loss: 0.6932308799827221, Validation Loss: 0.6671412913812755  
Accuracy: 0.5796610169491525, Precision: 0.5810153925398726, Recall: 0.5796610169491  
525, F1-score: 0.5784774014589666
```

```
Epoch 3/10 (Train): 100%|██████████| 1  
17/117 [00:12<00:00, 9.59sample/s]  
Epoch 3/10 (Eval): 100%|██████████| 1  
71/71 [00:03<00:00, 19.04sample/s]
```

```
Epoch 3/10, Training Loss: 0.6851298253970457, Validation Loss: 0.6546560049393756  
Accuracy: 0.5949152542372881, Precision: 0.6105376391809597, Recall: 0.5949152542372  
881, F1-score: 0.5785111323273994
```

```
Epoch 4/10 (Train): 100%|██████████| 1  
17/117 [00:11<00:00, 10.26sample/s]  
Epoch 4/10 (Eval): 100%|██████████| 1  
71/71 [00:03<00:00, 20.42sample/s]
```

Epoch 4/10, Training Loss: 0.6758141298474315, Validation Loss: 0.6630090113076786  
Accuracy: 0.6084745762711864, Precision: 0.6085393979791762, Recall: 0.6084745762711  
864, F1-score: 0.6082688519368354

Epoch 5/10 (Train): 100% | ██████████ | 1  
17/117 [00:11<00:00, 10.12sample/s]  
Epoch 5/10 (Eval): 100% | ██████████ |  
71/71 [00:03<00:00, 20.29sample/s]

Epoch 5/10, Training Loss: 0.6808163448912171, Validation Loss: 0.6422904494118555  
Accuracy: 0.6293785310734463, Precision: 0.6299142442038096, Recall: 0.6293785310734  
463, F1-score: 0.628768338685396

Epoch 6/10 (Train): 100% | ██████████ | 1  
17/117 [00:11<00:00, 10.09sample/s]  
Epoch 6/10 (Eval): 100% | ██████████ |  
71/71 [00:03<00:00, 20.41sample/s]

Epoch 6/10, Training Loss: 0.6722907174084195, Validation Loss: 0.6383570309749431  
Accuracy: 0.6344632768361582, Precision: 0.6345415896949597, Recall: 0.6344632768361  
582, F1-score: 0.6343076548255371

Epoch 7/10 (Train): 100% | ██████████ | 1  
17/117 [00:11<00:00, 10.08sample/s]  
Epoch 7/10 (Eval): 100% | ██████████ |  
71/71 [00:03<00:00, 19.97sample/s]

Epoch 7/10, Training Loss: 0.664116823693731, Validation Loss: 0.6444557994435736  
Accuracy: 0.6276836158192091, Precision: 0.6316963957649487, Recall: 0.6276836158192  
091, F1-score: 0.624260216907521

Epoch 8/10 (Train): 100% | ██████████ | 1  
17/117 [00:11<00:00, 10.03sample/s]  
Epoch 8/10 (Eval): 100% | ██████████ |  
71/71 [00:03<00:00, 18.87sample/s]

Epoch 8/10, Training Loss: 0.6732276863453724, Validation Loss: 0.6316001130699438  
Accuracy: 0.6468926553672316, Precision: 0.6502298653763193, Recall: 0.6468926553672  
316, F1-score: 0.6445096540362459

Epoch 9/10 (Train): 100% | ██████████ | 1  
17/117 [00:11<00:00, 9.90sample/s]  
Epoch 9/10 (Eval): 100% | ██████████ |  
71/71 [00:03<00:00, 19.31sample/s]

Epoch 9/10, Training Loss: 0.6615358262332445, Validation Loss: 0.6297939413853284  
Accuracy: 0.6480225988700565, Precision: 0.6590615780927985, Recall: 0.6480225988700  
565, F1-score: 0.6424573038318205

Epoch 10/10 (Train): 100% | ██████████ | 1  
17/117 [00:11<00:00, 9.86sample/s]  
Epoch 10/10 (Eval): 100% | ██████████ |  
71/71 [00:03<00:00, 19.84sample/s]

Epoch 10/10, Training Loss: 0.6582334004726607, Validation Loss: 0.6207369739389689  
Accuracy: 0.6598870056497175, Precision: 0.6639874409693, Recall: 0.659887005649717  
5, F1-score: 0.6581037668107768

Тренировка завершена!

Test: 100% | ██████████ |  
72/72 [00:03<00:00, 18.28sample/s]

```
Test Accuracy: 0.6521739130434783
Precision: 0.6541633408754581, Recall: 0.6521739130434783, F1-score: 0.6506927207379
681
Accuracy of cats : 58 %
Accuracy of dogs : 71 %
```

```
Class_name: cats
```

```
Train_count: 900
```

```
Test_count: 300
```

```
Valid_count: 300
```

```
Shutil images: 100%|██████████| 150
0/1500 [00:00<00:00, 1849.29image/s]
```

```
Class_name: dogs
```

```
Train_count: 900
```

```
Test_count: 300
```

```
Valid_count: 300
```

```
Shutil images: 100%|██████████| 150
0/1500 [00:00<00:00, 1775.26image/s]
```

---

```
-----
```

Выбранная модель: vgg11

Пользовательское название модели: vgg11\_Exp2

Выбранный оптимизатор: SGD

```
-----
```

```
Epoch 1/10 (Train): 100%|██████████| 1
17/117 [00:08<00:00, 13.31sample/s]
Epoch 1/10 (Eval): 100%|██████████| 1
71/71 [00:02<00:00, 24.51sample/s]
```

```
Epoch 1/10, Training Loss: 0.6942040427648735, Validation Loss: 0.6913207245748595
Accuracy: 0.5259887005649717, Precision: 0.5832342798444493, Recall: 0.5259887005649
717, F1-score: 0.420876993997328
```

```
Epoch 2/10 (Train): 100%|██████████| 1
17/117 [00:08<00:00, 13.38sample/s]
Epoch 2/10 (Eval): 100%|██████████| 1
71/71 [00:02<00:00, 24.09sample/s]
```

```
Epoch 2/10, Training Loss: 0.6952513509599614, Validation Loss: 0.6909728301110241
Accuracy: 0.4971751412429379, Precision: 0.7501509039867397, Recall: 0.4971751412429
379, F1-score: 0.3308268179758882
```

```
Epoch 3/10 (Train): 100%|██████████| 1
17/117 [00:09<00:00, 12.77sample/s]
Epoch 3/10 (Eval): 100%|██████████| 1
71/71 [00:02<00:00, 23.83sample/s]
```

```
Epoch 3/10, Training Loss: 0.6956300153765073, Validation Loss: 0.6891412532935708
Accuracy: 0.5242937853107345, Precision: 0.6331208230315069, Recall: 0.5242937853107
345, F1-score: 0.39699450445307927
```

```
Epoch 4/10 (Train): 100%|██████████| 1
17/117 [00:08<00:00, 13.07sample/s]
Epoch 4/10 (Eval): 100%|██████████| 1
71/71 [00:02<00:00, 24.46sample/s]
```

Epoch 4/10, Training Loss: 0.6924722504984472, Validation Loss: 0.6881853640079498  
Accuracy: 0.5169491525423728, Precision: 0.6259599261877804, Recall: 0.5169491525423  
728, F1-score: 0.3890975315915526

Epoch 5/10 (Train): 100% | ██████████ | 1  
17/117 [00:08<00:00, 13.52sample/s]  
Epoch 5/10 (Eval): 100% | ██████████ |  
71/71 [00:02<00:00, 24.41sample/s]

Epoch 5/10, Training Loss: 0.6884940539029046, Validation Loss: 0.6869129530117337  
Accuracy: 0.5316384180790961, Precision: 0.6375667693888032, Recall: 0.5316384180790  
961, F1-score: 0.42444270115008703

Epoch 6/10 (Train): 100% | ██████████ | 1  
17/117 [00:08<00:00, 13.43sample/s]  
Epoch 6/10 (Eval): 100% | ██████████ |  
71/71 [00:02<00:00, 24.33sample/s]

Epoch 6/10, Training Loss: 0.6889966454907381, Validation Loss: 0.6850432125525286  
Accuracy: 0.5858757062146893, Precision: 0.6180106795906656, Recall: 0.5858757062146  
893, F1-score: 0.5577208200182778

Epoch 7/10 (Train): 100% | ██████████ | 1  
17/117 [00:08<00:00, 13.45sample/s]  
Epoch 7/10 (Eval): 100% | ██████████ |  
71/71 [00:02<00:00, 24.47sample/s]

Epoch 7/10, Training Loss: 0.6875413794492938, Validation Loss: 0.6842238753192169  
Accuracy: 0.5531073446327683, Precision: 0.6285041006014216, Recall: 0.5531073446327  
683, F1-score: 0.4798806251943516

Epoch 8/10 (Train): 100% | ██████████ | 1  
17/117 [00:09<00:00, 12.85sample/s]  
Epoch 8/10 (Eval): 100% | ██████████ |  
71/71 [00:03<00:00, 23.42sample/s]

Epoch 8/10, Training Loss: 0.6883922145538723, Validation Loss: 0.6828662318698431  
Accuracy: 0.5644067796610169, Precision: 0.6289437095921847, Recall: 0.5644067796610  
169, F1-score: 0.5052027107671834

Epoch 9/10 (Train): 100% | ██████████ | 1  
17/117 [00:08<00:00, 13.31sample/s]  
Epoch 9/10 (Eval): 100% | ██████████ |  
71/71 [00:02<00:00, 24.31sample/s]

Epoch 9/10, Training Loss: 0.685567582595799, Validation Loss: 0.6803906927001004  
Accuracy: 0.6282485875706215, Precision: 0.6288974325907614, Recall: 0.6282485875706  
215, F1-score: 0.6275293090198132

Epoch 10/10 (Train): 100% | ██████████ | 1  
17/117 [00:08<00:00, 13.40sample/s]  
Epoch 10/10 (Eval): 100% | ██████████ |  
71/71 [00:02<00:00, 24.59sample/s]

Epoch 10/10, Training Loss: 0.6844140471461713, Validation Loss: 0.6790921634199929  
Accuracy: 0.5870056497175141, Precision: 0.6415650860116677, Recall: 0.5870056497175  
141, F1-score: 0.5452369903389724

Тренировка завершена!

Test: 100% | ██████████ |  
72/72 [00:03<00:00, 18.65sample/s]

```
Test Accuracy: 0.584726867335563
Precision: 0.6286258768198444, Recall: 0.584726867335563, F1-score: 0.54325243006108
96
Accuracy of cats : 28 %
Accuracy of dogs : 88 %
```

```
Class_name: cats
```

```
Train_count: 900
```

```
Test_count: 300
```

```
Valid_count: 300
```

```
Shutil images: 100%|██████████| 150
0/1500 [00:00<00:00, 1763.35image/s]
```

```
Class_name: dogs
```

```
Train_count: 900
```

```
Test_count: 300
```

```
Valid_count: 300
```

```
Shutil images: 100%|██████████| 150
0/1500 [00:00<00:00, 1826.39image/s]
```

---

```
Выбранная модель: vgg11_bn
```

```
Пользовательское название модели: vgg11_bn_Exp2
```

```
Выбранный оптимизатор: SGD
```

---

```
Epoch 1/10 (Train): 100%|██████████| 1
17/117 [00:08<00:00, 13.19sample/s]
```

```
Epoch 1/10 (Eval): 100%|██████████| 1
71/71 [00:02<00:00, 24.07sample/s]
```

```
Epoch 1/10, Training Loss: 0.7501083822389648, Validation Loss: 0.7595618680372076
Accuracy: 0.503954802259887, Precision: 0.5846201068554383, Recall: 0.50395480225988
7, F1-score: 0.3393605141996859
```

```
Epoch 2/10 (Train): 100%|██████████| 1
17/117 [00:09<00:00, 12.86sample/s]
```

```
Epoch 2/10 (Eval): 100%|██████████| 1
71/71 [00:02<00:00, 24.17sample/s]
```

```
Epoch 2/10, Training Loss: 0.7543212062714436, Validation Loss: 0.6555876560130361
Accuracy: 0.6615819209039548, Precision: 0.6681653138561479, Recall: 0.6615819209039
548, F1-score: 0.6577630282842563
```

```
Epoch 3/10 (Train): 100%|██████████| 1
17/117 [00:09<00:00, 12.63sample/s]
```

```
Epoch 3/10 (Eval): 100%|██████████| 1
71/71 [00:03<00:00, 22.67sample/s]
```

```
Epoch 3/10, Training Loss: 0.729715908515904, Validation Loss: 0.72951173294062
Accuracy: 0.5045197740112994, Precision: 0.75029814402945, Recall: 0.50451977401129
4, F1-score: 0.3396149214395107
```

```
Epoch 4/10 (Train): 100%|██████████| 1
17/117 [00:09<00:00, 12.80sample/s]
```

```
Epoch 4/10 (Eval): 100%|██████████| 1
71/71 [00:02<00:00, 24.07sample/s]
```

Epoch 4/10, Training Loss: 0.6974870219468251, Validation Loss: 0.6363084051905379  
Accuracy: 0.6745762711864407, Precision: 0.6779872707217541, Recall: 0.6745762711864  
407, F1-score: 0.6727031483841605

Epoch 5/10 (Train): 100% | ██████████ | 1  
17/117 [00:08<00:00, 13.02sample/s]  
Epoch 5/10 (Eval): 100% | ██████████ |  
71/71 [00:02<00:00, 24.32sample/s]

Epoch 5/10, Training Loss: 0.6791507558724315, Validation Loss: 0.6286773557885218  
Accuracy: 0.6615819209039548, Precision: 0.7023352865868371, Recall: 0.6615819209039  
548, F1-score: 0.6426622143170363

Epoch 6/10 (Train): 100% | ██████████ | 1  
17/117 [00:08<00:00, 13.14sample/s]  
Epoch 6/10 (Eval): 100% | ██████████ |  
71/71 [00:02<00:00, 24.13sample/s]

Epoch 6/10, Training Loss: 0.6794158944354434, Validation Loss: 0.6308527961794266  
Accuracy: 0.6344632768361582, Precision: 0.7044068145319529, Recall: 0.6344632768361  
582, F1-score: 0.5988319242243012

Epoch 7/10 (Train): 100% | ██████████ | 1  
17/117 [00:09<00:00, 12.74sample/s]  
Epoch 7/10 (Eval): 100% | ██████████ |  
71/71 [00:03<00:00, 23.58sample/s]

Epoch 7/10, Training Loss: 0.6627568029046468, Validation Loss: 0.6024321839634308  
Accuracy: 0.6937853107344633, Precision: 0.6961554914240664, Recall: 0.6937853107344  
633, F1-score: 0.6926440370264325

Epoch 8/10 (Train): 100% | ██████████ | 1  
17/117 [00:09<00:00, 12.62sample/s]  
Epoch 8/10 (Eval): 100% | ██████████ |  
71/71 [00:02<00:00, 23.69sample/s]

Epoch 8/10, Training Loss: 0.6812761243675992, Validation Loss: 0.6045046042924547  
Accuracy: 0.6870056497175141, Precision: 0.7035200351659463, Recall: 0.6870056497175  
141, F1-score: 0.6810525399031069

Epoch 9/10 (Train): 100% | ██████████ | 1  
17/117 [00:09<00:00, 12.54sample/s]  
Epoch 9/10 (Eval): 100% | ██████████ |  
71/71 [00:03<00:00, 22.96sample/s]

Epoch 9/10, Training Loss: 0.6513898444339582, Validation Loss: 0.5889166410865083  
Accuracy: 0.7107344632768362, Precision: 0.7132394022212182, Recall: 0.7107344632768  
362, F1-score: 0.7096961926399924

Epoch 10/10 (Train): 100% | ██████████ | 1  
17/117 [00:09<00:00, 12.43sample/s]  
Epoch 10/10 (Eval): 100% | ██████████ |  
71/71 [00:03<00:00, 20.84sample/s]

Epoch 10/10, Training Loss: 0.6543351576705159, Validation Loss: 0.6140841158938273  
Accuracy: 0.656497175141243, Precision: 0.7332015744575839, Recall: 0.65649717514124  
3, F1-score: 0.6245272371902951

Тренировка завершена!

Test: 100% | ██████████ |  
72/72 [00:04<00:00, 17.66sample/s]

```
Test Accuracy: 0.6594202898550725
Precision: 0.7399402589025756, Recall: 0.6594202898550725, F1-score: 0.6295533957440
731
Accuracy of cats : 94 %
Accuracy of dogs : 37 %
```

```
Class_name: cats
Train_count: 900
Test_count: 300
Valid_count: 300
```

```
Shutil images: 100%|██████████| 150
0/1500 [00:00<00:00, 1768.28image/s]
```

```
Class_name: dogs
Train_count: 900
Test_count: 300
Valid_count: 300
```

```
Shutil images: 100%|██████████| 150
0/1500 [00:00<00:00, 1751.91image/s]
```

---

```
-----  
Выбранная модель: vgg13
Пользовательское название модели: vgg13_Exp2
Выбранный оптимизатор: SGD
```

---

```
Epoch 1/10 (Train): 100%|██████████| 1
17/117 [00:09<00:00, 11.89sample/s]
Epoch 1/10 (Eval): 100%|██████████| 1
71/71 [00:03<00:00, 22.58sample/s]
```

```
Epoch 1/10, Training Loss: 0.6958320167466128, Validation Loss: 0.6926645336851562
Accuracy: 0.4966101694915254, Precision: 0.2466216604424016, Recall: 0.4966101694915
254, F1-score: 0.329573679866403
```

```
Epoch 2/10 (Train): 100%|██████████| 1
17/117 [00:09<00:00, 11.98sample/s]
Epoch 2/10 (Eval): 100%|██████████| 1
71/71 [00:03<00:00, 22.71sample/s]
```

```
Epoch 2/10, Training Loss: 0.6929879194682407, Validation Loss: 0.6921162660849296
Accuracy: 0.4966101694915254, Precision: 0.2466216604424016, Recall: 0.4966101694915
254, F1-score: 0.329573679866403
```

```
Epoch 3/10 (Train): 100%|██████████| 1
17/117 [00:09<00:00, 12.10sample/s]
Epoch 3/10 (Eval): 100%|██████████| 1
71/71 [00:03<00:00, 22.99sample/s]
```

```
Epoch 3/10, Training Loss: 0.6936786586476356, Validation Loss: 0.6902100427002557
Accuracy: 0.5909604519774011, Precision: 0.6133783379560027, Recall: 0.5909604519774
011, F1-score: 0.5714479560161398
```

```
Epoch 4/10 (Train): 100%|██████████| 1
17/117 [00:09<00:00, 12.09sample/s]
Epoch 4/10 (Eval): 100%|██████████| 1
71/71 [00:03<00:00, 22.84sample/s]
```

Epoch 4/10, Training Loss: 0.6945854797191227, Validation Loss: 0.6892847913806721  
Accuracy: 0.6135593220338983, Precision: 0.6157409285997775, Recall: 0.6135593220338983, F1-score: 0.612173387295924

Epoch 5/10 (Train): 100% | 17/117 [00:09<00:00, 11.74sample/s]

Epoch 5/10 (Eval): 100% | 71/71 [00:03<00:00, 22.54sample/s]

Epoch 5/10, Training Loss: 0.6897609108911756, Validation Loss: 0.688798623064817  
Accuracy: 0.519774011299435, Precision: 0.6316645091368877, Recall: 0.519774011299435, F1-score: 0.395416424661633

Epoch 6/10 (Train): 100% | 17/117 [00:09<00:00, 11.79sample/s]

Epoch 6/10 (Eval): 100% | 71/71 [00:03<00:00, 22.55sample/s]

Epoch 6/10, Training Loss: 0.6902968326385078, Validation Loss: 0.6871582178746239  
Accuracy: 0.6237288135593221, Precision: 0.6237720192489843, Recall: 0.6237288135593221, F1-score: 0.6235942292879927

Epoch 7/10 (Train): 100% | 17/117 [00:09<00:00, 11.87sample/s]

Epoch 7/10 (Eval): 100% | 71/71 [00:03<00:00, 22.81sample/s]

Epoch 7/10, Training Loss: 0.6903055736289401, Validation Loss: 0.6872356956624716  
Accuracy: 0.5146892655367231, Precision: 0.6249482772340256, Recall: 0.5146892655367231, F1-score: 0.38300677020296126

Epoch 8/10 (Train): 100% | 17/117 [00:09<00:00, 12.06sample/s]

Epoch 8/10 (Eval): 100% | 71/71 [00:03<00:00, 23.02sample/s]

Epoch 8/10, Training Loss: 0.6900825299757862, Validation Loss: 0.6849559806497757  
Accuracy: 0.6259887005649718, Precision: 0.6289070208675425, Recall: 0.6259887005649718, F1-score: 0.623358145700401

Epoch 9/10 (Train): 100% | 17/117 [00:09<00:00, 12.01sample/s]

Epoch 9/10 (Eval): 100% | 71/71 [00:03<00:00, 22.55sample/s]

Epoch 9/10, Training Loss: 0.6871944821577302, Validation Loss: 0.6837462326564357  
Accuracy: 0.6050847457627119, Precision: 0.6277405111331158, Recall: 0.6050847457627119, F1-score: 0.5852315248224608

Epoch 10/10 (Train): 100% | 17/117 [00:09<00:00, 12.12sample/s]

Epoch 10/10 (Eval): 100% | 71/71 [00:03<00:00, 22.74sample/s]

Epoch 10/10, Training Loss: 0.6863546376580635, Validation Loss: 0.682316010281191  
Accuracy: 0.5836158192090396, Precision: 0.6321167645825707, Recall: 0.5836158192090396, F1-score: 0.543876245778779

Тренировка завершена!

Test: 100% | 72/72 [00:03<00:00, 18.03sample/s]

```
Test Accuracy: 0.5791527313266444
Precision: 0.6161949685802467, Recall: 0.5791527313266444, F1-score: 0.5398083002904
223
Accuracy of cats : 28 %
Accuracy of dogs : 86 %
```

```
Class_name: cats
```

```
Train_count: 900
```

```
Test_count: 300
```

```
Valid_count: 300
```

```
Shutil images: 100%|██████████| 150
0/1500 [00:00<00:00, 1768.68image/s]
```

```
Class_name: dogs
```

```
Train_count: 900
```

```
Test_count: 300
```

```
Valid_count: 300
```

```
Shutil images: 100%|██████████| 150
0/1500 [00:00<00:00, 1758.08image/s]
```

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```
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```

Выбранная модель: vgg13\_bn

Пользовательское название модели: vgg13\_bn\_Exp2

Выбранный оптимизатор: SGD

```
-----
```

```
Epoch 1/10 (Train): 100%|██████████| 1
17/117 [00:10<00:00, 11.43sample/s]
Epoch 1/10 (Eval): 100%|██████████| 1
71/71 [00:03<00:00, 22.13sample/s]
```

```
Epoch 1/10, Training Loss: 0.7632632950941721, Validation Loss: 0.6822936739456855
Accuracy: 0.5293785310734463, Precision: 0.624667534065385, Recall: 0.52937853107344
63, F1-score: 0.42304098697420883
```

```
Epoch 2/10 (Train): 100%|██████████| 1
17/117 [00:10<00:00, 11.38sample/s]
Epoch 2/10 (Eval): 100%|██████████| 1
71/71 [00:03<00:00, 21.79sample/s]
```

```
Epoch 2/10, Training Loss: 0.7291031253501722, Validation Loss: 0.6849127683767491
Accuracy: 0.5248587570621469, Precision: 0.6628925132885368, Recall: 0.5248587570621
469, F1-score: 0.40143265070970646
```

```
Epoch 3/10 (Train): 100%|██████████| 1
17/117 [00:10<00:00, 11.11sample/s]
Epoch 3/10 (Eval): 100%|██████████| 1
71/71 [00:03<00:00, 21.80sample/s]
```

```
Epoch 3/10, Training Loss: 0.7193226628901622, Validation Loss: 0.644100360193495
Accuracy: 0.6124293785310735, Precision: 0.6840128638215979, Recall: 0.6124293785310
735, F1-score: 0.5724236913367818
```

```
Epoch 4/10 (Train): 100%|██████████| 1
17/117 [00:10<00:00, 11.34sample/s]
Epoch 4/10 (Eval): 100%|██████████| 1
71/71 [00:03<00:00, 22.10sample/s]
```

Epoch 4/10, Training Loss: 0.6976524949893099, Validation Loss: 0.6240055877610114  
Accuracy: 0.6638418079096046, Precision: 0.6764116659031914, Recall: 0.6638418079096  
046, F1-score: 0.6583292493858667

Epoch 5/10 (Train): 100% | ██████████ | 1  
17/117 [00:10<00:00, 11.68sample/s]  
Epoch 5/10 (Eval): 100% | ██████████ |  
71/71 [00:03<00:00, 22.66sample/s]

Epoch 5/10, Training Loss: 0.6817355245044551, Validation Loss: 0.6157738100000694  
Accuracy: 0.6627118644067796, Precision: 0.6679802667568012, Recall: 0.6627118644067  
796, F1-score: 0.6604381656575377

Epoch 6/10 (Train): 100% | ██████████ | 1  
17/117 [00:10<00:00, 11.65sample/s]  
Epoch 6/10 (Eval): 100% | ██████████ |  
71/71 [00:03<00:00, 22.35sample/s]

Epoch 6/10, Training Loss: 0.672553958556906, Validation Loss: 0.6124722688211559  
Accuracy: 0.6853107344632768, Precision: 0.6915887753406447, Recall: 0.6853107344632  
768, F1-score: 0.6823475587049272

Epoch 7/10 (Train): 100% | ██████████ | 1  
17/117 [00:10<00:00, 11.51sample/s]  
Epoch 7/10 (Eval): 100% | ██████████ |  
71/71 [00:03<00:00, 22.50sample/s]

Epoch 7/10, Training Loss: 0.6580564562500137, Validation Loss: 0.6210165059162398  
Accuracy: 0.6429378531073446, Precision: 0.6846000847285414, Recall: 0.6429378531073  
446, F1-score: 0.6227305540629456

Epoch 8/10 (Train): 100% | ██████████ | 1  
17/117 [00:10<00:00, 11.64sample/s]  
Epoch 8/10 (Eval): 100% | ██████████ |  
71/71 [00:03<00:00, 22.56sample/s]

Epoch 8/10, Training Loss: 0.6695412525401492, Validation Loss: 0.6152434038408732  
Accuracy: 0.6790960451977401, Precision: 0.7119372114885717, Recall: 0.6790960451977  
401, F1-score: 0.6653922966622416

Epoch 9/10 (Train): 100% | ██████████ | 1  
17/117 [00:10<00:00, 11.51sample/s]  
Epoch 9/10 (Eval): 100% | ██████████ |  
71/71 [00:03<00:00, 22.07sample/s]

Epoch 00009: reducing learning rate of group 0 to 1.0000e-04.

Epoch 9/10, Training Loss: 0.6394560920311413, Validation Loss: 0.6150788828983145  
Accuracy: 0.6587570621468927, Precision: 0.7222819972667888, Recall: 0.6587570621468  
927, F1-score: 0.6313742224367331

Epoch 10/10 (Train): 100% | ██████████ | 1  
17/117 [00:10<00:00, 11.50sample/s]  
Epoch 10/10 (Eval): 100% | ██████████ |  
71/71 [00:03<00:00, 21.62sample/s]

Epoch 10/10, Training Loss: 0.6360229120119331, Validation Loss: 0.586057418062862  
Accuracy: 0.7073446327683616, Precision: 0.710710769995111, Recall: 0.70734463276836  
16, F1-score: 0.7059503364154291

Тренировка завершена!

Test: 100% | ██████████ |  
72/72 [00:04<00:00, 17.58sample/s]

```
Test Accuracy: 0.701783723522854
Precision: 0.7054518894689836, Recall: 0.701783723522854, F1-score: 0.70070407005255
57
Accuracy of cats : 76 %
Accuracy of dogs : 64 %
```

```
Class_name: cats
```

```
Train_count: 900
```

```
Test_count: 300
```

```
Valid_count: 300
```

```
Shutil images: 100%|██████████| 150
0/1500 [00:00<00:00, 1793.05image/s]
```

```
Class_name: dogs
```

```
Train_count: 900
```

```
Test_count: 300
```

```
Valid_count: 300
```

```
Shutil images: 100%|██████████| 150
0/1500 [00:00<00:00, 1763.36image/s]
```

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```
Выбранная модель: vgg16
```

```
Пользовательское название модели: vgg16_Exp2
```

```
Выбранный оптимизатор: SGD
```

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```
Epoch 1/10 (Train): 100%|██████████| 1
17/117 [00:11<00:00, 10.41sample/s]
Epoch 1/10 (Eval): 100%|██████████| 1
71/71 [00:03<00:00, 21.99sample/s]
```

```
Epoch 1/10, Training Loss: 0.693501518968864, Validation Loss: 0.6928150170603714
Accuracy: 0.4966101694915254, Precision: 0.2466216604424016, Recall: 0.4966101694915
254, F1-score: 0.329573679866403
```

```
Epoch 2/10 (Train): 100%|██████████| 1
17/117 [00:10<00:00, 11.36sample/s]
Epoch 2/10 (Eval): 100%|██████████| 1
71/71 [00:03<00:00, 22.35sample/s]
```

```
Epoch 2/10, Training Loss: 0.6941775200293236, Validation Loss: 0.6922213979023325
Accuracy: 0.5163841807909605, Precision: 0.6634995305628305, Recall: 0.5163841807909
605, F1-score: 0.380623852564163
```

```
Epoch 3/10 (Train): 100%|██████████| 1
17/117 [00:10<00:00, 11.19sample/s]
Epoch 3/10 (Eval): 100%|██████████| 1
71/71 [00:03<00:00, 21.58sample/s]
```

```
Epoch 3/10, Training Loss: 0.6921791949427825, Validation Loss: 0.6918216852818505
Accuracy: 0.611864406779661, Precision: 0.6118551298484525, Recall: 0.61186440677966
1, F1-score: 0.6118033125130915
```

```
Epoch 4/10 (Train): 100%|██████████| 1
17/117 [00:10<00:00, 11.22sample/s]
Epoch 4/10 (Eval): 100%|██████████| 1
71/71 [00:03<00:00, 22.05sample/s]
```

Epoch 4/10, Training Loss: 0.6936369113291252, Validation Loss: 0.6914297928244381  
Accuracy: 0.5638418079096045, Precision: 0.6377558104580928, Recall: 0.5638418079096045, F1-score: 0.4993650014867677

Epoch 5/10 (Train): 100% | ██████████ | 1  
17/117 [00:10<00:00, 11.24sample/s]  
Epoch 5/10 (Eval): 100% | ██████████ |  
71/71 [00:03<00:00, 22.01sample/s]

Epoch 5/10, Training Loss: 0.6930282356607955, Validation Loss: 0.6910762950188696  
Accuracy: 0.5915254237288136, Precision: 0.6528597262605489, Recall: 0.5915254237288136, F1-score: 0.5481506074630149

Epoch 6/10 (Train): 100% | ██████████ | 1  
17/117 [00:10<00:00, 11.35sample/s]  
Epoch 6/10 (Eval): 100% | ██████████ |  
71/71 [00:03<00:00, 22.09sample/s]

Epoch 6/10, Training Loss: 0.6905504045207885, Validation Loss: 0.6908662837777434  
Accuracy: 0.49887005649717514, Precision: 0.7505700904082769, Recall: 0.49887005649717514, F1-score: 0.3345716638722668

Epoch 7/10 (Train): 100% | ██████████ | 1  
17/117 [00:10<00:00, 10.94sample/s]  
Epoch 7/10 (Eval): 100% | ██████████ |  
71/71 [00:03<00:00, 21.74sample/s]

Epoch 7/10, Training Loss: 0.6923962051106483, Validation Loss: 0.690435687364158  
Accuracy: 0.5005649717514125, Precision: 0.695057700266605, Recall: 0.5005649717514125, F1-score: 0.33927015921931175

Epoch 8/10 (Train): 100% | ██████████ | 1  
17/117 [00:10<00:00, 10.75sample/s]  
Epoch 8/10 (Eval): 100% | ██████████ |  
71/71 [00:03<00:00, 20.06sample/s]

Epoch 8/10, Training Loss: 0.6916577211769995, Validation Loss: 0.6897746110703312  
Accuracy: 0.6429378531073446, Precision: 0.6434908720191833, Recall: 0.6429378531073446, F1-score: 0.6427408283909914

Epoch 9/10 (Train): 100% | ██████████ | 1  
17/117 [00:11<00:00, 10.09sample/s]  
Epoch 9/10 (Eval): 100% | ██████████ |  
71/71 [00:03<00:00, 21.03sample/s]

Epoch 9/10, Training Loss: 0.6914410042189241, Validation Loss: 0.6893438639613868  
Accuracy: 0.6463276836158192, Precision: 0.648569955443733, Recall: 0.6463276836158192, F1-score: 0.6446426845483758

Epoch 10/10 (Train): 100% | ██████████ | 1  
17/117 [00:10<00:00, 11.17sample/s]  
Epoch 10/10 (Eval): 100% | ██████████ |  
71/71 [00:03<00:00, 21.04sample/s]

Epoch 10/10, Training Loss: 0.6909317066988994, Validation Loss: 0.6888152312087474  
Accuracy: 0.6135593220338983, Precision: 0.6575542002455892, Recall: 0.6135593220338983, F1-score: 0.5861429225836006

Тренировка завершена!

Test: 100% | ██████████ |  
72/72 [00:04<00:00, 16.99sample/s]

```
Test Accuracy: 0.6237458193979933
Precision: 0.6671027451250204, Recall: 0.6237458193979933, F1-score: 0.5959629053722
033
Accuracy of cats : 36 %
Accuracy of dogs : 88 %
```

```
Class_name: cats
```

```
Train_count: 900
```

```
Test_count: 300
```

```
Valid_count: 300
```

```
Shutil images: 100%|██████████| 150
0/1500 [00:00<00:00, 1824.60image/s]
```

```
Class_name: dogs
```

```
Train_count: 900
```

```
Test_count: 300
```

```
Valid_count: 300
```

```
Shutil images: 100%|██████████| 150
0/1500 [00:00<00:00, 1812.69image/s]
```

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```

Выбранная модель: vgg16\_bn

Пользовательское название модели: vgg16\_bn\_Exp2

Выбранный оптимизатор: SGD

```
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```

```
Epoch 1/10 (Train): 100%|██████████| 1
17/117 [00:11<00:00, 10.33sample/s]
Epoch 1/10 (Eval): 100%|██████████| 1
71/71 [00:03<00:00, 21.58sample/s]
```

```
Epoch 1/10, Training Loss: 0.7790136704944663, Validation Loss: 0.7911404320749186
Accuracy: 0.5028248587570622, Precision: 0.4519076199164546, Recall: 0.5028248587570
622, F1-score: 0.3388511481311395
```

```
Epoch 2/10 (Train): 100%|██████████| 1
17/117 [00:10<00:00, 10.67sample/s]
Epoch 2/10 (Eval): 100%|██████████| 1
71/71 [00:03<00:00, 20.59sample/s]
```

```
Epoch 2/10, Training Loss: 0.7478211042807275, Validation Loss: 0.6728886773357283
Accuracy: 0.5757062146892655, Precision: 0.6319791165742857, Recall: 0.5757062146892
655, F1-score: 0.5223357974788919
```

```
Epoch 3/10 (Train): 100%|██████████| 1
17/117 [00:10<00:00, 10.81sample/s]
Epoch 3/10 (Eval): 100%|██████████| 1
71/71 [00:03<00:00, 21.86sample/s]
```

```
Epoch 3/10, Training Loss: 0.7260859797091009, Validation Loss: 0.660672726940974
Accuracy: 0.6310734463276836, Precision: 0.6532398766954175, Recall: 0.6310734463276
836, F1-score: 0.6161335696091935
```

```
Epoch 4/10 (Train): 100%|██████████| 1
17/117 [00:10<00:00, 10.70sample/s]
Epoch 4/10 (Eval): 100%|██████████| 1
71/71 [00:03<00:00, 21.79sample/s]
```

Epoch 4/10, Training Loss: 0.7119776093468224, Validation Loss: 0.6522315132752651  
Accuracy: 0.6242937853107344, Precision: 0.6351419227166983, Recall: 0.6242937853107344, F1-score: 0.61744551453087

Epoch 5/10 (Train): 100% | ██████████ | 1  
17/117 [00:11<00:00, 10.50sample/s]  
Epoch 5/10 (Eval): 100% | ██████████ |  
71/71 [00:03<00:00, 21.01sample/s]

Epoch 5/10, Training Loss: 0.7103005839172507, Validation Loss: 0.6702621846886004  
Accuracy: 0.5677966101694916, Precision: 0.6617336176184822, Recall: 0.5677966101694916, F1-score: 0.4914301021829228

Epoch 6/10 (Train): 100% | ██████████ | 1  
17/117 [00:11<00:00, 10.42sample/s]  
Epoch 6/10 (Eval): 100% | ██████████ |  
71/71 [00:03<00:00, 18.55sample/s]

Epoch 6/10, Training Loss: 0.6878413866270858, Validation Loss: 0.6356535986655176  
Accuracy: 0.6632768361581921, Precision: 0.6719124250788983, Recall: 0.6632768361581921, F1-score: 0.6584692546800182

Epoch 7/10 (Train): 100% | ██████████ | 1  
17/117 [00:11<00:00, 10.09sample/s]  
Epoch 7/10 (Eval): 100% | ██████████ |  
71/71 [00:03<00:00, 20.86sample/s]

Epoch 7/10, Training Loss: 0.6900126217157161, Validation Loss: 0.6404040234405443  
Accuracy: 0.6384180790960452, Precision: 0.6848722670284857, Recall: 0.6384180790960452, F1-score: 0.6129106672383493

Epoch 8/10 (Train): 100% | ██████████ | 1  
17/117 [00:11<00:00, 10.55sample/s]  
Epoch 8/10 (Eval): 100% | ██████████ |  
71/71 [00:03<00:00, 20.93sample/s]

Epoch 8/10, Training Loss: 0.6739041175936505, Validation Loss: 0.6335289210586225  
Accuracy: 0.6412429378531074, Precision: 0.6533186970836717, Recall: 0.6412429378531074, F1-score: 0.6332647934787009

Epoch 9/10 (Train): 100% | ██████████ | 1  
17/117 [00:11<00:00, 10.47sample/s]  
Epoch 9/10 (Eval): 100% | ██████████ |  
71/71 [00:03<00:00, 21.07sample/s]

Epoch 9/10, Training Loss: 0.6844419186672395, Validation Loss: 0.6199416647859886  
Accuracy: 0.6757062146892655, Precision: 0.6757006964977875, Recall: 0.6757062146892655, F1-score: 0.6756896506012687

Epoch 10/10 (Train): 100% | ██████████ | 1  
17/117 [00:11<00:00, 10.49sample/s]  
Epoch 10/10 (Eval): 100% | ██████████ |  
71/71 [00:03<00:00, 20.60sample/s]

Epoch 10/10, Training Loss: 0.6613279162198817, Validation Loss: 0.6179805205198331  
Accuracy: 0.6700564971751413, Precision: 0.6751156304910504, Recall: 0.6700564971751413, F1-score: 0.6672712921096099

Тренировка завершена!

Test: 100% | ██████████ |  
72/72 [00:04<00:00, 16.88sample/s]

```
Test Accuracy: 0.6705685618729097
Precision: 0.6754250104894627, Recall: 0.6705685618729097, F1-score: 0.6686705572414
045
Accuracy of cats : 74 %
Accuracy of dogs : 59 %
```

```
Class_name: cats
```

```
Train_count: 900
```

```
Test_count: 300
```

```
Valid_count: 300
```

```
Shutil images: 100%|██████████| 150
0/1500 [00:00<00:00, 1813.42image/s]
```

```
Class_name: dogs
```

```
Train_count: 900
```

```
Test_count: 300
```

```
Valid_count: 300
```

```
Shutil images: 100%|██████████| 150
0/1500 [00:00<00:00, 1819.57image/s]
```

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```

Выбранная модель: vgg19

Пользовательское название модели: vgg19\_Exp2

Выбранный оптимизатор: SGD

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```
Epoch 1/10 (Train): 100%|██████████| 1
17/117 [00:11<00:00, 10.34sample/s]
Epoch 1/10 (Eval): 100%|██████████| 1
71/71 [00:03<00:00, 21.22sample/s]
```

```
Epoch 1/10, Training Loss: 0.693270394175323, Validation Loss: 0.6929523628310296
Accuracy: 0.4966101694915254, Precision: 0.2466216604424016, Recall: 0.4966101694915
254, F1-score: 0.329573679866403
```

```
Epoch 2/10 (Train): 100%|██████████| 1
17/117 [00:11<00:00, 10.19sample/s]
Epoch 2/10 (Eval): 100%|██████████| 1
71/71 [00:03<00:00, 20.79sample/s]
```

```
Epoch 2/10, Training Loss: 0.6918124323038711, Validation Loss: 0.692699471941102
Accuracy: 0.4966101694915254, Precision: 0.2466216604424016, Recall: 0.4966101694915
254, F1-score: 0.329573679866403
```

```
Epoch 3/10 (Train): 100%|██████████| 1
17/117 [00:11<00:00, 10.31sample/s]
Epoch 3/10 (Eval): 100%|██████████| 1
71/71 [00:03<00:00, 20.70sample/s]
```

```
Epoch 3/10, Training Loss: 0.6934800744056702, Validation Loss: 0.6924767042957457
Accuracy: 0.4966101694915254, Precision: 0.2466216604424016, Recall: 0.4966101694915
254, F1-score: 0.329573679866403
```

```
Epoch 4/10 (Train): 100%|██████████| 1
17/117 [00:11<00:00, 10.40sample/s]
Epoch 4/10 (Eval): 100%|██████████| 1
71/71 [00:03<00:00, 21.34sample/s]
```

Epoch 4/10, Training Loss: 0.6920819735199315, Validation Loss: 0.692040083266921  
Accuracy: 0.4966101694915254, Precision: 0.49831467137050384, Recall: 0.4966101694915254, F1-score: 0.3305748845483462

Epoch 5/10 (Train): 100% | ██████████ | 1  
17/117 [00:11<00:00, 10.39sample/s]  
Epoch 5/10 (Eval): 100% | ██████████ |  
71/71 [00:03<00:00, 20.74sample/s]

Epoch 5/10, Training Loss: 0.6933163295906434, Validation Loss: 0.6919779521597307  
Accuracy: 0.4966101694915254, Precision: 0.2466216604424016, Recall: 0.4966101694915254, F1-score: 0.329573679866403

Epoch 6/10 (Train): 100% | ██████████ | 1  
17/117 [00:11<00:00, 10.37sample/s]  
Epoch 6/10 (Eval): 100% | ██████████ |  
71/71 [00:03<00:00, 21.21sample/s]

Epoch 6/10, Training Loss: 0.6930485010351922, Validation Loss: 0.691725401891827  
Accuracy: 0.4966101694915254, Precision: 0.2466216604424016, Recall: 0.4966101694915254, F1-score: 0.329573679866403

Epoch 7/10 (Train): 100% | ██████████ | 1  
17/117 [00:11<00:00, 10.33sample/s]  
Epoch 7/10 (Eval): 100% | ██████████ |  
71/71 [00:03<00:00, 20.08sample/s]

Epoch 7/10, Training Loss: 0.6920795195905614, Validation Loss: 0.6913450026916246  
Accuracy: 0.4966101694915254, Precision: 0.2466216604424016, Recall: 0.4966101694915254, F1-score: 0.329573679866403

Epoch 8/10 (Train): 100% | ██████████ | 1  
17/117 [00:11<00:00, 10.25sample/s]  
Epoch 8/10 (Eval): 100% | ██████████ |  
71/71 [00:03<00:00, 20.73sample/s]

Epoch 8/10, Training Loss: 0.6925016565830847, Validation Loss: 0.6910592684638028  
Accuracy: 0.4994350282485876, Precision: 0.750710135881308, Recall: 0.4994350282485876, F1-score: 0.3358151181990014

Epoch 9/10 (Train): 100% | ██████████ | 1  
17/117 [00:11<00:00, 10.32sample/s]  
Epoch 9/10 (Eval): 100% | ██████████ |  
71/71 [00:03<00:00, 20.34sample/s]

Epoch 9/10, Training Loss: 0.6927372594059947, Validation Loss: 0.6907242048258162  
Accuracy: 0.5067796610169492, Precision: 0.7067845091727106, Recall: 0.5067796610169492, F1-score: 0.3536318740861908

Epoch 10/10 (Train): 100% | ██████████ | 1  
17/117 [00:11<00:00, 10.07sample/s]  
Epoch 10/10 (Eval): 100% | ██████████ |  
71/71 [00:03<00:00, 20.79sample/s]

Epoch 10/10, Training Loss: 0.6909206350849256, Validation Loss: 0.6901896087463293  
Accuracy: 0.5418079096045197, Precision: 0.6379148714612516, Recall: 0.5418079096045197, F1-score: 0.4491382406726746

Тренировка завершена!

Test: 100% | ██████████ |  
72/72 [00:04<00:00, 17.65sample/s]

```
Test Accuracy: 0.5429208472686734
Precision: 0.6163696879443712, Recall: 0.5429208472686734, F1-score: 0.4521805418493
1805
Accuracy of cats : 13 %
Accuracy of dogs : 94 %
```

```
Class_name: cats
```

```
Train_count: 900
```

```
Test_count: 300
```

```
Valid_count: 300
```

```
Shutil images: 100%|██████████| 150
0/1500 [00:00<00:00, 1809.90image/s]
```

```
Class_name: dogs
```

```
Train_count: 900
```

```
Test_count: 300
```

```
Valid_count: 300
```

```
Shutil images: 100%|██████████| 150
0/1500 [00:00<00:00, 1771.36image/s]
```

---

```
Выбранная модель: vgg19_bn
```

```
Пользовательское название модели: vgg19_bn_Exp2
```

```
Выбранный оптимизатор: SGD
```

---

```
Epoch 1/10 (Train): 100%|██████████| 1
17/117 [00:11<00:00, 10.18sample/s]
```

```
Epoch 1/10 (Eval): 100%|██████████| 1
71/71 [00:03<00:00, 20.38sample/s]
```

```
Epoch 1/10, Training Loss: 0.7653489095443713, Validation Loss: 0.6865889766795487
Accuracy: 0.5418079096045197, Precision: 0.5576855176894009, Recall: 0.5418079096045
197, F1-score: 0.5031981543865746
```

```
Epoch 2/10 (Train): 100%|██████████| 1
17/117 [00:12<00:00, 9.50sample/s]
```

```
Epoch 2/10 (Eval): 100%|██████████| 1
71/71 [00:03<00:00, 19.35sample/s]
```

```
Epoch 2/10, Training Loss: 0.7309655675158877, Validation Loss: 0.7041485874497958
Accuracy: 0.5016949152542373, Precision: 0.4787309292095452, Recall: 0.5016949152542
373, F1-score: 0.3507797893270441
```

```
Epoch 3/10 (Train): 100%|██████████| 1
17/117 [00:11<00:00, 9.92sample/s]
```

```
Epoch 3/10 (Eval): 100%|██████████| 1
71/71 [00:03<00:00, 19.53sample/s]
```

```
Epoch 3/10, Training Loss: 0.7241322255830994, Validation Loss: 0.6832724607596963
Accuracy: 0.5644067796610169, Precision: 0.5870491258045794, Recall: 0.5644067796610
169, F1-score: 0.5311522471977659
```

```
Epoch 4/10 (Train): 100%|██████████| 1
17/117 [00:12<00:00, 9.60sample/s]
```

```
Epoch 4/10 (Eval): 100%|██████████| 1
71/71 [00:03<00:00, 20.64sample/s]
```

Epoch 4/10, Training Loss: 0.7323266380431316, Validation Loss: 0.6740283738758605  
Accuracy: 0.6141242937853107, Precision: 0.6158055454932541, Recall: 0.6141242937853  
107, F1-score: 0.6122553791559753

Epoch 5/10 (Train): 100% | ██████████ | 1  
17/117 [00:11<00:00, 9.83sample/s]

Epoch 5/10 (Eval): 100% | ██████████ |  
71/71 [00:03<00:00, 20.84sample/s]

Epoch 5/10, Training Loss: 0.7162848901502865, Validation Loss: 0.6746488956071562  
Accuracy: 0.5576271186440678, Precision: 0.635717644169605, Recall: 0.55762711864406  
78, F1-score: 0.486650266378752

Epoch 6/10 (Train): 100% | ██████████ | 1  
17/117 [00:11<00:00, 9.92sample/s]

Epoch 6/10 (Eval): 100% | ██████████ |  
71/71 [00:03<00:00, 20.41sample/s]

Epoch 6/10, Training Loss: 0.7071455303336337, Validation Loss: 0.664618533378267  
Accuracy: 0.619774011299435, Precision: 0.6599028409391748, Recall: 0.61977401129943  
5, F1-score: 0.5928245649518408

Epoch 7/10 (Train): 100% | ██████████ | 1  
17/117 [00:11<00:00, 9.96sample/s]

Epoch 7/10 (Eval): 100% | ██████████ |  
71/71 [00:03<00:00, 20.54sample/s]

Epoch 7/10, Training Loss: 0.6985864078056362, Validation Loss: 0.6561052364818121  
Accuracy: 0.6457627118644068, Precision: 0.6660422194831827, Recall: 0.6457627118644  
068, F1-score: 0.633704363696362

Epoch 8/10 (Train): 100% | ██████████ | 1  
17/117 [00:11<00:00, 9.94sample/s]

Epoch 8/10 (Eval): 100% | ██████████ |  
71/71 [00:03<00:00, 20.72sample/s]

Epoch 8/10, Training Loss: 0.7045647277659977, Validation Loss: 0.657269462690515  
Accuracy: 0.6045197740112994, Precision: 0.66327062155088, Recall: 0.60451977401129  
94, F1-score: 0.5635101786368765

Epoch 9/10 (Train): 100% | ██████████ | 1  
17/117 [00:12<00:00, 9.62sample/s]

Epoch 9/10 (Eval): 100% | ██████████ |  
71/71 [00:03<00:00, 20.62sample/s]

Epoch 9/10, Training Loss: 0.6981170901523013, Validation Loss: 0.6559675985810447  
Accuracy: 0.6322033898305085, Precision: 0.6324804432855281, Recall: 0.6322033898305  
085, F1-score: 0.6321220214707479

Epoch 10/10 (Train): 100% | ██████████ | 1  
17/117 [00:11<00:00, 9.79sample/s]

Epoch 10/10 (Eval): 100% | ██████████ |  
71/71 [00:03<00:00, 20.67sample/s]

Epoch 10/10, Training Loss: 0.6819913219340479, Validation Loss: 0.6545449863214278  
Accuracy: 0.6107344632768361, Precision: 0.6601324807056568, Recall: 0.6107344632768  
361, F1-score: 0.576468675966825

Тренировка завершена!

Test: 100% | ██████████ |  
72/72 [00:03<00:00, 18.55sample/s]

```
Test Accuracy: 0.6036789297658863
Precision: 0.6560115623066224, Recall: 0.6036789297658863, F1-score: 0.5695131568811
389
Accuracy of  cats : 88 %
Accuracy of  dogs : 32 %
```

```
Class_name: cats
```

```
Train_count: 900
```

```
Test_count: 300
```

```
Valid_count: 300
```

```
Shutil images: 100%|██████████| 150
0/1500 [00:00<00:00, 1764.52image/s]
```

```
Class_name: dogs
```

```
Train_count: 900
```

```
Test_count: 300
```

```
Valid_count: 300
```

```
Shutil images: 100%|██████████| 150
0/1500 [00:00<00:00, 1783.79image/s]
```

---

```
-----
```

Выбранная модель: vit\_b\_16

Пользовательское название модели: vit\_b\_16\_Exp2

Выбранный оптимизатор: SGD

```
-----
```

```
Epoch 1/10 (Train):  0%
| 0/117 [00:00<?, ?sample/s]
```

06:46:29-247112 ERROR

GraduateModel

Traceback (most recent call last)

```
in graduate:59
  56 |         num_workers=num_workers,
  57 |         pin_memory=pin_memory,
  58 |         seed=seed)
> 59 |         train.graduate()
  60 |     except Exception as ex:
  61 |         log.exception("GraduateModel\"
  62 |
```

```
in graduate:111
```

```
 108 |         # Выводим информацию
 109 |         print(self.__str__())
 110 |         # Обучаем
> 111 |         self.train_model()
 112 |         # Тестируем
 113 |         self.evaluate_model()
 114 |
```

```
in train_model:417
```

```
 414 |             unit=
 415 |             inputs, labels = inputs.cuda(),
 416 |             self.optimizer.zero_grad()
> 417 |             outputs = self.model(inputs)
 418 |             loss = self.criterion(outputs)
 419 |             loss.backward()
 420 |             self.optimizer.step()
```

```
C:\Users\NightMare\PycharmProjects\CVtools\venv\lib\site-packages\torch\nn\functional.py:1130 in _call_impl
```

```
 1127 |             # this function, and just call forward
 1128 |             if not (self._backward_hooks or self._global_backward_hooks
 1129 |                     or self._global_forward_hooks or
> 1130 |                     return forward_call(*input, **kwargs)
 1131 |             # Do not call functions when jit is used
 1132 |             full_backward_hooks, non_full_backward_hooks
 1133 |             if self._backward_hooks or self._global_backward_hooks or self._global_forward_hooks
```

```
C:\Users\NightMare\PycharmProjects\CVtools\venv\lib\site-packages\torchvision\models\detection\transformer.py:291 in forward
```

```
 288 |
 289 |     def forward(self, x: torch.Tensor):
 290 |         # Reshape and permute the input tensor
> 291 |         x = self._process_input(x)
 292 |         n = x.shape[0]
 293 |
 294 |         # Expand the class token to the full
```

```
C:\Users\NightMare\PycharmProjects\CVtools\venv\lib  
ision_transformer.py:271 in _process_input
```

```
268     def _process_input(self, x: torch.Tensor  
269         n, c, h, w = x.shape  
270         p = self.patch_size  
271     torch._assert(h == self.image_size,  
272         torch._assert(w == self.image_size,  
273             n_h = h // p  
274             n_w = w // p
```

```
C:\Users\NightMare\PycharmProjects\CVtools\venv\lib  
3 in _assert
```

```
830     if type(condition) is not torch.Tensor:  
831         return handle_torch_function(_assert  
832             assert condition, message  
833             #####  
834 # Import most common subpackages
```

**AssertionError:** Wrong image height!

```
Class_name: cats  
Train_count: 900  
Test_count: 300  
Valid_count: 300
```

```
Shutil images: 100%|██████████| 150  
0/1500 [00:00<00:00, 1734.54image/s]
```

```
Class_name: dogs  
Train_count: 900  
Test_count: 300  
Valid_count: 300
```

```
Shutil images: 100%|██████████| 150  
0/1500 [00:00<00:00, 1731.11image/s]
```

---

```
-----  
Выбранная модель: vit_b_32  
Пользовательское название модели: vit_b_32_Exp2  
Выбранный оптимизатор: SGD  
-----
```

```
Epoch 1/10 (Train):  0%|  
| 0/117 [00:00<?, ?sample/s]
```

06:46:36-714967 ERROR

GraduateModel

Traceback (most recent call last)

```
in graduate:59
  56 |           num_workers=num_workers,
  57 |           pin_memory=pin_memory,
  58 |           seed=seed)
> 59 |           train.graduate()
  60 |     except Exception as ex:
  61 |         log.exception("GraduateModel\"
  62

in graduate:111
 108 |         # Выводим информацию
 109 |         print(self.__str__())
 110 |         # Обучаем
> 111 |         self.train_model()
 112 |         # Тестируем
 113 |         self.evaluate_model()
 114

in train_model:417
 414 |             unit=
 415 |             inputs, labels = inputs.cuda()
 416 |             self.optimizer.zero_grad()
> 417 |             outputs = self.model(inputs)
 418 |             loss = self.criterion(outputs)
 419 |             loss.backward()
 420 |             self.optimizer.step()

C:\Users\NightMare\PycharmProjects\CVtools\venv\lib\site-packages\torch\nn\modules\module.py:1130 in __call__impl
 1127 |         # this function, and just call forward
 1128 |         if not (self._backward_hooks or self._global_backward_hooks
 1129 |                 or self._global_forward_hooks or
> 1130 |                 return forward_call(*input, **kwargs)
 1131 |         # Do not call functions when jit is used
 1132 |         full_backward_hooks, non_full_backward_hooks
 1133 |         if self._backward_hooks or self._global_forward_hooks or self._global_forward_hooks

C:\Users\NightMare\PycharmProjects\CVtools\venv\lib\site-packages\torch\vision\models\detection\transformer.py:291 in forward
 288 |
 289 |     def forward(self, x: torch.Tensor):
 290 |         # Reshape and permute the input tensor
> 291 |         x = self._process_input(x)
 292 |         n = x.shape[0]
 293 |
 294 |         # Expand the class token to the full
```

```
C:\Users\NightMare\PycharmProjects\CVtools\venv\lib\site-packages\vision_transformer.py:271 in _process_input
```

```
268     def _process_input(self, x: torch.Tensor):
269         n, c, h, w = x.shape
270         p = self.patch_size
271     > 271         torch._assert(h == self.image_size,
272         torch._assert(w == self.image_size,
273         n_h = h // p
274         n_w = w // p
```

```
C:\Users\NightMare\PycharmProjects\CVtools\venv\lib\site-packages\vision_transformer.py:3 in _assert
```

```
830
831     if type(condition) is not torch.Tensor:
832         return handle_torch_function(_assert)
833     > 833     assert condition, message
834
835 ##### Import most common subpackages
836 # Import most common subpackages
```

**AssertionError:** Wrong image height!

```
Class_name: cats
Train_count: 900
Test_count: 300
Valid_count: 300
```

```
Shutil images: 100%|██████████| 150 /1500 [00:00<00:00, 1783.27image/s]
```

```
Class_name: dogs
Train_count: 900
Test_count: 300
Valid_count: 300
```

```
Shutil images: 100%|██████████| 150 /1500 [00:00<00:00, 1788.06image/s]
```

-----

```
Выбранная модель: wide_resnet101_2
```

```
Пользовательское название модели: wide_resnet101_2_Exp2
```

```
Выбранный оптимизатор: SGD
```

-----

```
Epoch 1/10 (Train): 100%|██████████| 1
```

```
17/117 [00:16<00:00, 6.96sample/s]
```

```
Epoch 1/10 (Eval): 100%|██████████|
```

```
71/71 [00:04<00:00, 16.18sample/s]
```

```
Epoch 1/10, Training Loss: 0.7341173126320659, Validation Loss: 0.8124274554225684
```

```
Accuracy: 0.503954802259887, Precision: 0.5076691714221873, Recall: 0.503954802259887,
```

```
F1-score: 0.35826712610850436
```

```
Epoch 2/10 (Train): 100%|██████████| 1  
17/117 [00:16<00:00, 6.97sample/s]  
Epoch 2/10 (Eval): 100%|██████████|  
71/71 [00:04<00:00, 16.07sample/s]  
Epoch 2/10, Training Loss: 0.7389494878115114, Validation Loss: 0.7487983163972359  
Accuracy: 0.4994350282485876, Precision: 0.5076095131052466, Recall: 0.4994350282485876, F1-score: 0.3937773013868211  
Epoch 3/10 (Train): 100%|██████████| 1  
17/117 [00:17<00:00, 6.86sample/s]  
Epoch 3/10 (Eval): 100%|██████████|  
71/71 [00:04<00:00, 15.78sample/s]  
Epoch 3/10, Training Loss: 0.7424020796911823, Validation Loss: 0.708954110657428  
Accuracy: 0.5169491525423728, Precision: 0.5205850219828903, Recall: 0.5169491525423728, F1-score: 0.5023890459753259  
Epoch 4/10 (Train): 100%|██████████| 1  
17/117 [00:17<00:00, 6.77sample/s]  
Epoch 4/10 (Eval): 100%|██████████|  
71/71 [00:04<00:00, 15.64sample/s]  
Epoch 4/10, Training Loss: 0.7375236752721452, Validation Loss: 0.6904905630370318  
Accuracy: 0.5372881355932203, Precision: 0.5378114826372772, Recall: 0.537288135593203, F1-score: 0.5338079906955415  
Epoch 5/10 (Train): 100%|██████████| 1  
17/117 [00:17<00:00, 6.77sample/s]  
Epoch 5/10 (Eval): 100%|██████████|  
71/71 [00:04<00:00, 15.83sample/s]  
Epoch 5/10, Training Loss: 0.7240483496606964, Validation Loss: 0.8415589753517323  
Accuracy: 0.4966101694915254, Precision: 0.4983127627310594, Recall: 0.4966101694915254, F1-score: 0.3315708596507212  
Epoch 6/10 (Train): 100%|██████████| 1  
17/117 [00:17<00:00, 6.79sample/s]  
Epoch 6/10 (Eval): 100%|██████████|  
71/71 [00:04<00:00, 15.70sample/s]  
Epoch 6/10, Training Loss: 0.7192975829557046, Validation Loss: 0.7024761115090322  
Accuracy: 0.5327683615819209, Precision: 0.5546227137795653, Recall: 0.5327683615819209, F1-score: 0.4866669958887283  
Epoch 7/10 (Train): 100%|██████████| 1  
17/117 [00:17<00:00, 6.83sample/s]  
Epoch 7/10 (Eval): 100%|██████████|  
71/71 [00:04<00:00, 15.83sample/s]  
Epoch 00007: reducing learning rate of group 0 to 1.0000e-04.  
Epoch 7/10, Training Loss: 0.7236346212244525, Validation Loss: 0.7660138580085194  
Accuracy: 0.511864406779661, Precision: 0.569310613647122, Recall: 0.511864406779661, F1-score: 0.3745672588756241  
Epoch 8/10 (Train): 100%|██████████| 1  
17/117 [00:17<00:00, 6.76sample/s]  
Epoch 8/10 (Eval): 100%|██████████|  
71/71 [00:04<00:00, 15.94sample/s]  
Epoch 8/10, Training Loss: 0.6964522866448996, Validation Loss: 0.6851364251247234  
Accuracy: 0.5451977401129944, Precision: 0.5518748937135083, Recall: 0.5451977401129944, F1-score: 0.5329364492151484
```

```
Epoch 9/10 (Train): 100%|██████████| 1  
17/117 [00:17<00:00, 6.72sample/s]  
Epoch 9/10 (Eval): 100%|██████████| 1  
71/71 [00:04<00:00, 15.83sample/s]  
Epoch 9/10, Training Loss: 0.6996333326670722, Validation Loss: 0.6909290249064818  
Accuracy: 0.5378531073446328, Precision: 0.5407829711444226, Recall: 0.5378531073446  
328, F1-score: 0.5318861725635998  
Epoch 10/10 (Train): 100%|██████████| 1  
17/117 [00:17<00:00, 6.77sample/s]  
Epoch 10/10 (Eval): 100%|██████████| 1  
71/71 [00:04<00:00, 15.66sample/s]  
Epoch 10/10, Training Loss: 0.6998929979465262, Validation Loss: 0.6806814714340167  
Accuracy: 0.5423728813559322, Precision: 0.5437338589885904, Recall: 0.5423728813559  
322, F1-score: 0.5401946574616654  
Тренировка завершена!  
Test: 100%|██████████| 1  
72/72 [00:04<00:00, 15.30sample/s]  
Test Accuracy: 0.5301003344481605  
Precision: 0.5300429894021919, Recall: 0.5301003344481605, F1-score: 0.5286422769094  
47  
Accuracy of cats : 47 %  
Accuracy of dogs : 58 %  
  
Class_name: cats  
Train_count: 900  
Test_count: 300  
Valid_count: 300  
Shutil images: 100%|██████████| 150  
0/1500 [00:00<00:00, 1776.65image/s]  
Class_name: dogs  
Train_count: 900  
Test_count: 300  
Valid_count: 300  
Shutil images: 100%|██████████| 150  
0/1500 [00:00<00:00, 1789.31image/s]
```

---

Выбранная модель: wide\_resnet50\_2  
Пользовательское название модели: wide\_resnet50\_2\_Exp2  
Выбранный оптимизатор: SGD

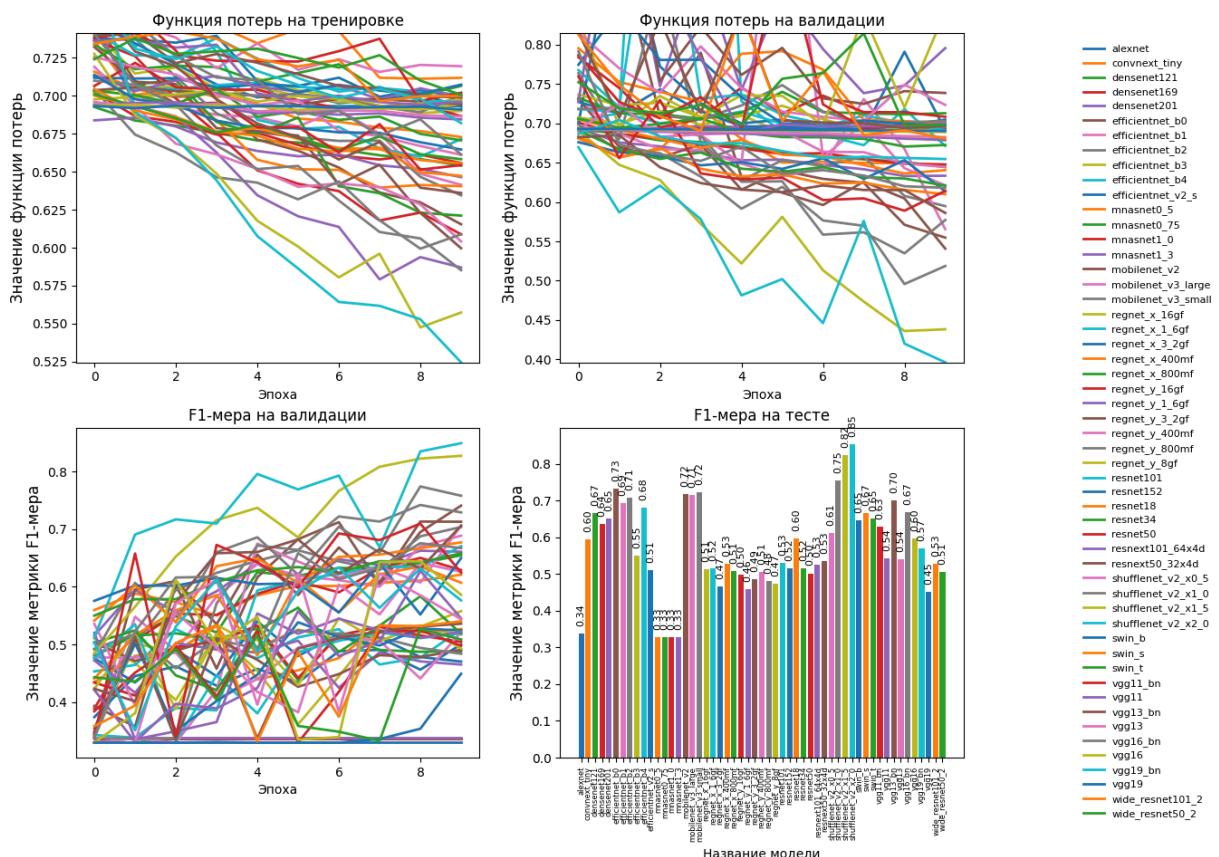
---

```
Epoch 1/10 (Train): 100%|██████████| 1  
17/117 [00:11<00:00, 10.13sample/s]  
Epoch 1/10 (Eval): 100%|██████████| 1  
71/71 [00:03<00:00, 19.95sample/s]  
Epoch 1/10, Training Loss: 0.7240147006880376, Validation Loss: 0.7521856350582198  
Accuracy: 0.5, Precision: 0.5037229065959768, Recall: 0.5, F1-score: 0.4429679590969  
914
```

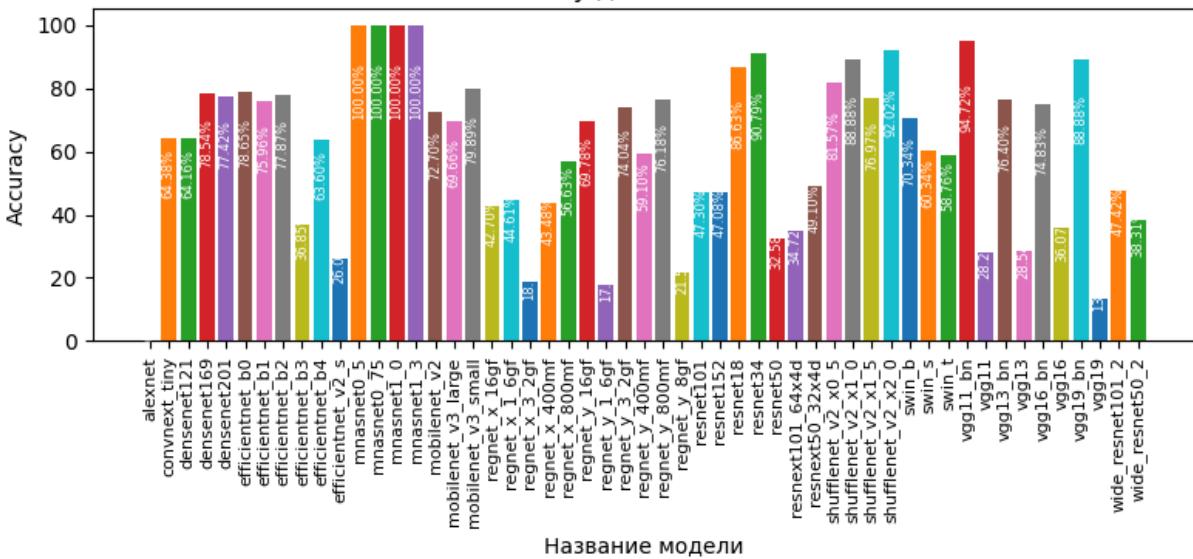
```
Epoch 2/10 (Train): 100%|██████████| 1  
17/117 [00:11<00:00, 10.30sample/s]  
Epoch 2/10 (Eval): 100%|██████████|  
71/71 [00:03<00:00, 19.76sample/s]  
Epoch 2/10, Training Loss: 0.7378491977440942, Validation Loss: 0.7190479120965731  
Accuracy: 0.4937853107344633, Precision: 0.4858178329205038, Recall: 0.4937853107344633, F1-score: 0.4355355475231934  
Epoch 3/10 (Train): 100%|██████████| 1  
17/117 [00:11<00:00, 10.24sample/s]  
Epoch 3/10 (Eval): 100%|██████████|  
71/71 [00:03<00:00, 19.06sample/s]  
Epoch 3/10, Training Loss: 0.7275325398879362, Validation Loss: 0.7126074251482042  
Accuracy: 0.5033898305084745, Precision: 0.5048872799078492, Recall: 0.5033898305084745, F1-score: 0.49184414828904555  
Epoch 4/10 (Train): 100%|██████████| 1  
17/117 [00:11<00:00, 10.19sample/s]  
Epoch 4/10 (Eval): 100%|██████████|  
71/71 [00:03<00:00, 19.66sample/s]  
Epoch 4/10, Training Loss: 0.7291866550126027, Validation Loss: 0.723405659703885  
Accuracy: 0.5090395480225989, Precision: 0.5206488749209527, Recall: 0.5090395480225989, F1-score: 0.4043518616871648  
Epoch 5/10 (Train): 100%|██████████| 1  
17/117 [00:11<00:00, 10.22sample/s]  
Epoch 5/10 (Eval): 100%|██████████|  
71/71 [00:03<00:00, 19.90sample/s]  
Epoch 5/10, Training Loss: 0.7309774504494422, Validation Loss: 0.6979796076561772  
Accuracy: 0.5203389830508475, Precision: 0.5219164973853354, Recall: 0.5203389830508475, F1-score: 0.5156125820851483  
Epoch 6/10 (Train): 100%|██████████| 1  
17/117 [00:11<00:00, 9.82sample/s]  
Epoch 6/10 (Eval): 100%|██████████|  
71/71 [00:03<00:00, 18.99sample/s]  
Epoch 6/10, Training Loss: 0.7248031183616402, Validation Loss: 0.7565301390690992  
Accuracy: 0.5062146892655367, Precision: 0.5360237622778332, Recall: 0.5062146892655367, F1-score: 0.35849144937909666  
Epoch 7/10 (Train): 100%|██████████| 1  
17/117 [00:11<00:00, 9.85sample/s]  
Epoch 7/10 (Eval): 100%|██████████|  
71/71 [00:03<00:00, 18.91sample/s]  
Epoch 7/10, Training Loss: 0.7185076900159371, Validation Loss: 0.7637097951719316  
Accuracy: 0.5067796610169492, Precision: 0.6089964811066313, Recall: 0.5067796610169492, F1-score: 0.3484904632671514  
Epoch 8/10 (Train): 100%|██████████| 1  
17/117 [00:12<00:00, 9.42sample/s]  
Epoch 8/10 (Eval): 100%|██████████|  
71/71 [00:03<00:00, 18.89sample/s]  
Epoch 00008: reducing learning rate of group 0 to 1.0000e-04.  
Epoch 8/10, Training Loss: 0.7266650618761266, Validation Loss: 0.8141984440344202  
Accuracy: 0.4971751412429379, Precision: 0.5487914726076728, Recall: 0.4971751412429379, F1-score: 0.33281654085452744
```

Epoch 9/10 (Train): 100% | 1  
 17/117 [00:12<00:00, 9.74sample/s]  
 Epoch 9/10 (Eval): 100% |  
 71/71 [00:03<00:00, 18.64sample/s]  
 Epoch 9/10, Training Loss: 0.7099576041460857, Validation Loss: 0.6974037348550591  
 Accuracy: 0.5310734463276836, Precision: 0.5328931936646439, Recall: 0.5310734463276836, F1-score: 0.5270207994161518  
 Epoch 10/10 (Train): 100% | 1  
 17/117 [00:11<00:00, 10.01sample/s]  
 Epoch 10/10 (Eval): 100% |  
 71/71 [00:03<00:00, 19.18sample/s]  
 Epoch 10/10, Training Loss: 0.7005605008389122, Validation Loss: 0.6977975801222742  
 Accuracy: 0.5146892655367231, Precision: 0.5162964830308113, Recall: 0.5146892655367231, F1-score: 0.5086122607426871  
 Тренировка завершена!

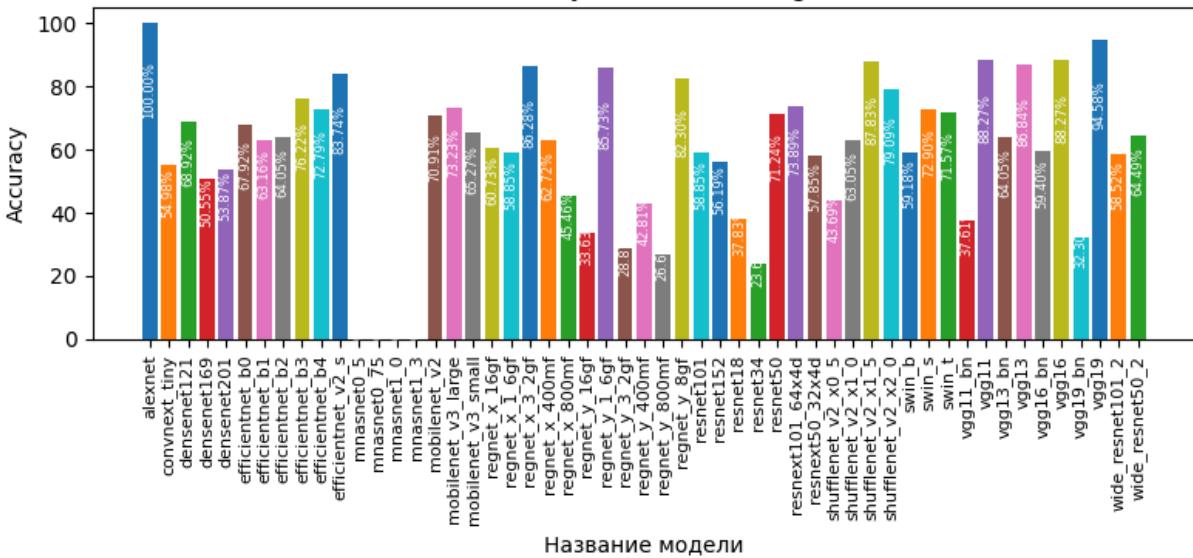
Test: 100% |  
 72/72 [00:03<00:00, 18.08sample/s]  
 Test Accuracy: 0.5150501672240803  
 Precision: 0.5150613603638674, Recall: 0.5150501672240803, F1-score: 0.5065822318225057  
 Accuracy of cats : 38 %  
 Accuracy of dogs : 64 %



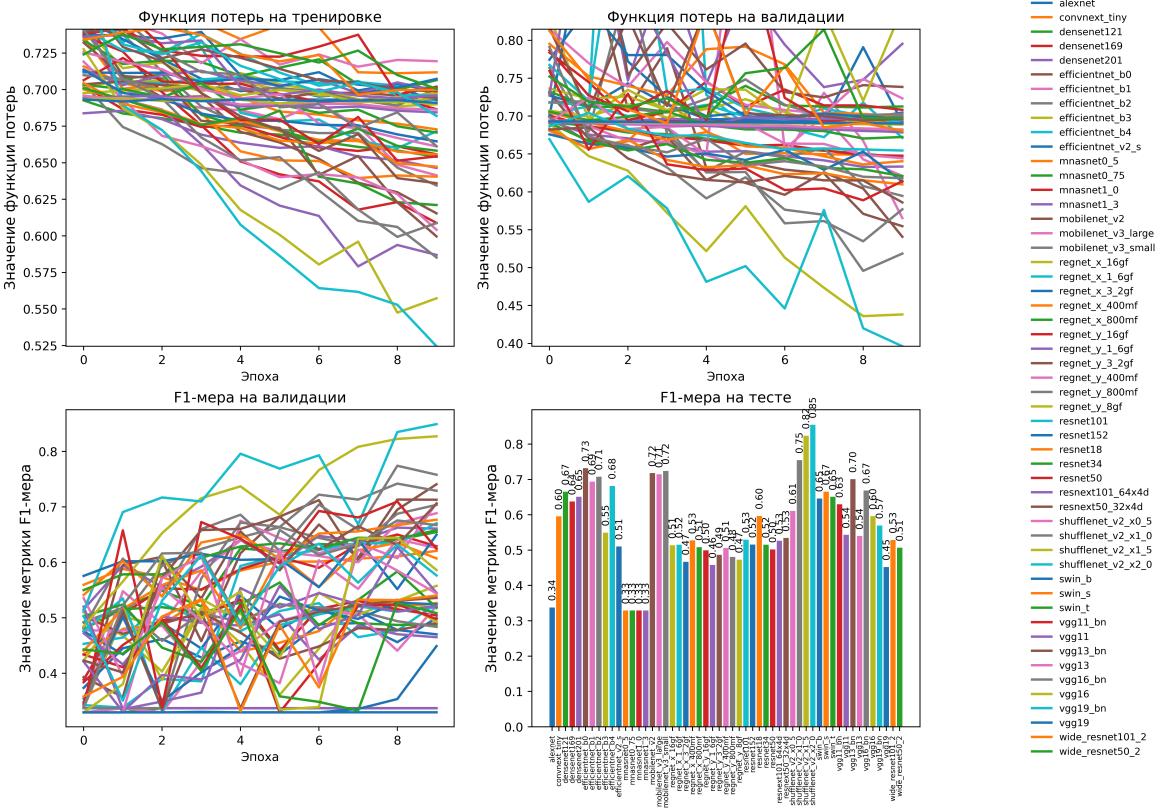
Accuracy для класса: cats

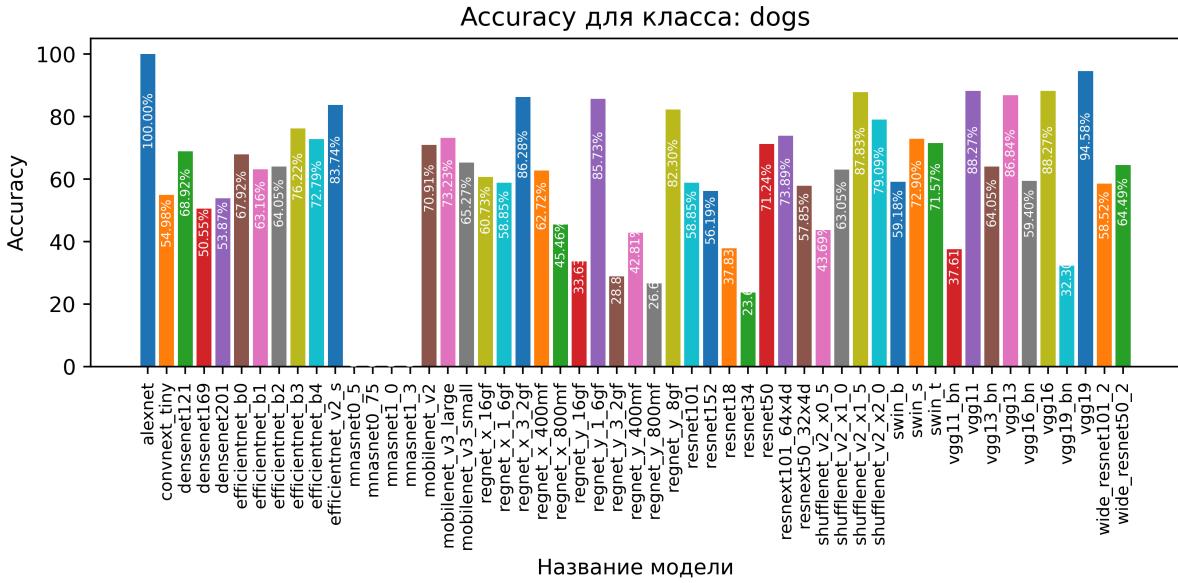
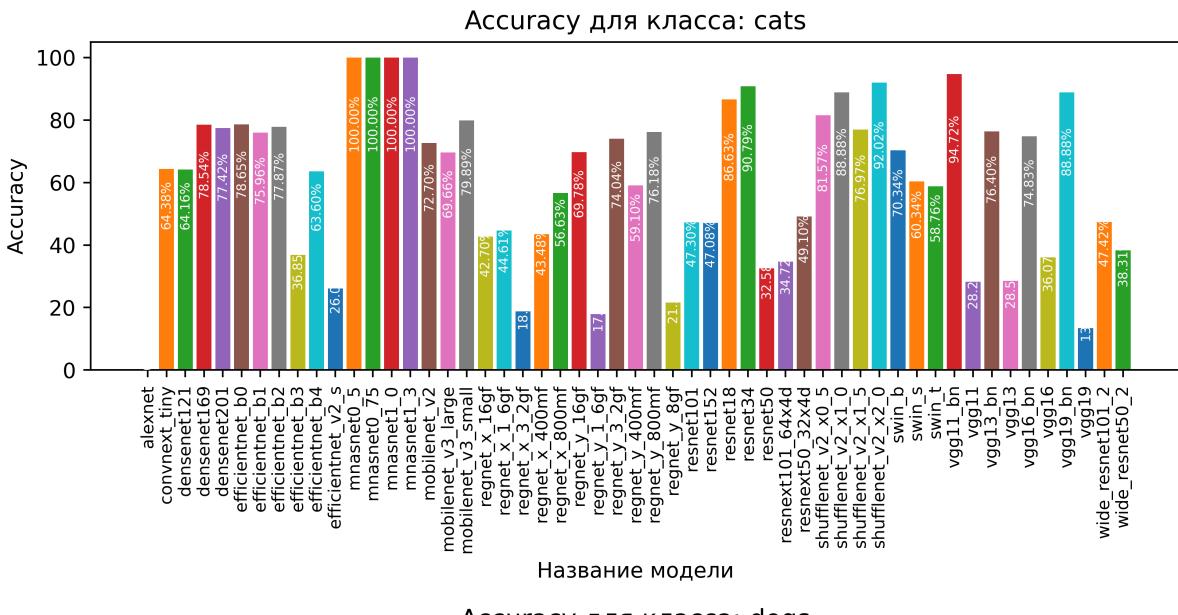


Accuracy для класса: dogs



```
In [200]: ipd.display(ipd.Image(filename="./plot/PlotsMetrics_Exp2.png"))
ipd.display(ipd.Image(filename="./plot/AccuracyForClass_Exp2.png"))
```





**Exp3 / Дисбаланс классов + кроссэнтропия + oversampling**

```
In [201... graduate_pipeline = validate_with_pydantic(EntryGraduateModel)(GraduateModelPipeliner
    entry = {
        "prefix": "Exp3",
        "models": model_list,
        "name_optimizers": optimizer_list,
        "name_loss": "CrossEntropyLoss",
        "ratio": (70, 15, 15),
        "size_img": (64, 64),
        "batch_size": 25,
        "num_epochs": 10,
        "class_percentage": {"cats": 0.3, "dogs": 1.0},
        "resampling_method": "oversampling"
    }
)
```

```
In [202... graduate_pipeline.graduate()
```

```
Class_name: cats
Train_count: 900
Test_count: 300
Valid_count: 300
Shutil images: 100%|██████████| 150 /1500 [00:00<00:00, 1581.45image/s]
Class_name: dogs
Train_count: 900
Test_count: 300
Valid_count: 300
Shutil images: 100%|██████████| 150 /1500 [00:00<00:00, 1795.42image/s]
```

---

```
-----  
Выбранная модель: alexnet  
Пользовательское название модели: alexnet_Exp3  
Выбранный оптимизатор: SGD
```

---

```
Epoch 1/10 (Train): 100%|██████████| 1 /118 [00:06<00:00, 17.00sample/s]
Epoch 1/10 (Eval): 100%|██████████| 1 /71 [00:02<00:00, 25.49sample/s]
Epoch 1/10, Training Loss: 0.6932017837007487, Validation Loss: 0.6931827024551435
Accuracy: 0.4966101694915254, Precision: 0.2466216604424016, Recall: 0.4966101694915
254, F1-score: 0.329573679866403
Epoch 2/10 (Train): 100%|██████████| 1 /118 [00:08<00:00, 14.70sample/s]
Epoch 2/10 (Eval): 100%|██████████| 1 /71 [00:02<00:00, 24.54sample/s]
Epoch 2/10, Training Loss: 0.6932622427330878, Validation Loss: 0.6931674884537519
Accuracy: 0.4966101694915254, Precision: 0.2466216604424016, Recall: 0.4966101694915
254, F1-score: 0.329573679866403
```

```
Epoch 3/10 (Train): 100%|██████████| 1  
18/118 [00:08<00:00, 14.60sample/s]  
Epoch 3/10 (Eval): 100%|██████████| 1  
71/71 [00:02<00:00, 24.02sample/s]  
Epoch 3/10, Training Loss: 0.6930515760440005, Validation Loss: 0.6931550096994066  
Accuracy: 0.4966101694915254, Precision: 0.2466216604424016, Recall: 0.4966101694915  
254, F1-score: 0.329573679866403  
Epoch 4/10 (Train): 100%|██████████| 1  
18/118 [00:07<00:00, 15.24sample/s]  
Epoch 4/10 (Eval): 100%|██████████| 1  
71/71 [00:02<00:00, 24.83sample/s]  
Epoch 00004: reducing learning rate of group 0 to 1.0000e-04.  
  
Epoch 4/10, Training Loss: 0.6931298087902943, Validation Loss: 0.6931441847213917  
Accuracy: 0.49830508474576274, Precision: 0.6497508042444904, Recall: 0.498305084745  
76274, F1-score: 0.3343158295267644  
Epoch 5/10 (Train): 100%|██████████| 1  
18/118 [00:07<00:00, 15.67sample/s]  
Epoch 5/10 (Eval): 100%|██████████| 1  
71/71 [00:02<00:00, 25.34sample/s]  
Epoch 5/10, Training Loss: 0.692986300320798, Validation Loss: 0.6931432972183336  
Accuracy: 0.4977401129943503, Precision: 0.5824906798877743, Recall: 0.4977401129943  
503, F1-score: 0.33405981658444817  
Epoch 6/10 (Train): 100%|██████████| 1  
18/118 [00:07<00:00, 15.11sample/s]  
Epoch 6/10 (Eval): 100%|██████████| 1  
71/71 [00:02<00:00, 24.42sample/s]  
Epoch 6/10, Training Loss: 0.6931437788478985, Validation Loss: 0.6931436065226625  
Accuracy: 0.4977401129943503, Precision: 0.6244414265696681, Recall: 0.4977401129943  
503, F1-score: 0.33307126176149393  
Epoch 7/10 (Train): 100%|██████████| 1  
18/118 [00:07<00:00, 15.34sample/s]  
Epoch 7/10 (Eval): 100%|██████████| 1  
71/71 [00:02<00:00, 25.18sample/s]  
Epoch 00007: reducing learning rate of group 0 to 1.0000e-05.  
  
Epoch 7/10, Training Loss: 0.6930578311501671, Validation Loss: 0.6931439383892016  
Accuracy: 0.4966101694915254, Precision: 0.49831467137050384, Recall: 0.496610169491  
5254, F1-score: 0.3305748845483462  
Epoch 8/10 (Train): 100%|██████████| 1  
18/118 [00:07<00:00, 15.18sample/s]  
Epoch 8/10 (Eval): 100%|██████████| 1  
71/71 [00:02<00:00, 24.64sample/s]  
Epoch 8/10, Training Loss: 0.6932054604884296, Validation Loss: 0.6931439515224285  
Accuracy: 0.4966101694915254, Precision: 0.49831467137050384, Recall: 0.496610169491  
5254, F1-score: 0.3305748845483462  
Epoch 9/10 (Train): 100%|██████████| 1  
18/118 [00:07<00:00, 14.86sample/s]  
Epoch 9/10 (Eval): 100%|██████████| 1  
71/71 [00:02<00:00, 23.78sample/s]  
Epoch 9/10, Training Loss: 0.693161254029362, Validation Loss: 0.6931440023715887  
Accuracy: 0.4966101694915254, Precision: 0.49831467137050384, Recall: 0.496610169491  
5254, F1-score: 0.3305748845483462
```

```
Epoch 10/10 (Train): 100%|██████████| 1  
18/118 [00:07<00:00, 15.07sample/s]  
Epoch 10/10 (Eval): 100%|██████████| 1  
71/71 [00:02<00:00, 25.27sample/s]  
Epoch 00010: reducing learning rate of group 0 to 1.0000e-06.  
  
Epoch 10/10, Training Loss: 0.6929924607032468, Validation Loss: 0.693143883835798  
Accuracy: 0.4966101694915254, Precision: 0.49831467137050384, Recall: 0.496610169491  
5254, F1-score: 0.3305748845483462  
Тренировка завершена!  
  
Test: 100%|██████████| 1  
72/72 [00:03<00:00, 19.60sample/s]  
Test Accuracy: 0.5027870680044593  
Precision: 0.25363811912724954, Recall: 0.5027870680044593, F1-score: 0.337180645011  
89254  
Accuracy of cats : 0 %  
Accuracy of dogs : 99 %  
  
Class_name: cats  
Train_count: 900  
Test_count: 300  
Valid_count: 300  
  
Shutil images: 100%|██████████| 150  
0/1500 [00:00<00:00, 1822.13image/s]  
Class_name: dogs  
Train_count: 900  
Test_count: 300  
Valid_count: 300  
  
Shutil images: 100%|██████████| 150  
0/1500 [00:00<00:00, 1756.67image/s]
```

---

Выбранная модель: convnext\_tiny  
Пользовательское название модели: convnext\_tiny\_Exp3  
Выбранный оптимизатор: SGD

---

```
Epoch 1/10 (Train): 100%|██████████| 1  
18/118 [00:10<00:00, 11.76sample/s]  
Epoch 1/10 (Eval): 100%|██████████| 1  
71/71 [00:03<00:00, 23.47sample/s]  
Epoch 1/10, Training Loss: 0.7233959969517636, Validation Loss: 1.015580299547163  
Accuracy: 0.507909604519774, Precision: 0.5081384126682098, Recall: 0.50790960451977  
4, F1-score: 0.507568104155418  
  
Epoch 2/10 (Train): 100%|██████████| 1  
18/118 [00:09<00:00, 12.20sample/s]  
Epoch 2/10 (Eval): 100%|██████████| 1  
71/71 [00:02<00:00, 23.73sample/s]  
Epoch 2/10, Training Loss: 0.6925649058712889, Validation Loss: 0.8389011653466413  
Accuracy: 0.5084745762711864, Precision: 0.5093814958196342, Recall: 0.5084745762711  
864, F1-score: 0.5047332271875173
```

```
Epoch 3/10 (Train): 100%|██████████| 1  
18/118 [00:09<00:00, 12.57sample/s]  
Epoch 3/10 (Eval): 100%|██████████|  
71/71 [00:03<00:00, 23.57sample/s]  
Epoch 3/10, Training Loss: 0.6914106284765372, Validation Loss: 0.7434138096658524  
Accuracy: 0.5480225988700564, Precision: 0.5482765991302996, Recall: 0.5480225988700564, F1-score: 0.5478407688810962  
Epoch 4/10 (Train): 100%|██████████| 1  
18/118 [00:09<00:00, 12.31sample/s]  
Epoch 4/10 (Eval): 100%|██████████|  
71/71 [00:03<00:00, 22.90sample/s]  
Epoch 4/10, Training Loss: 0.6851130623525735, Validation Loss: 0.955540308676197  
Accuracy: 0.5163841807909605, Precision: 0.5169070171871485, Recall: 0.5163841807909605, F1-score: 0.515245715277006  
Epoch 5/10 (Train): 100%|██████████| 1  
18/118 [00:09<00:00, 11.92sample/s]  
Epoch 5/10 (Eval): 100%|██████████|  
71/71 [00:03<00:00, 22.40sample/s]  
Epoch 5/10, Training Loss: 0.686723942656429, Validation Loss: 0.7359262780617859  
Accuracy: 0.5468926553672316, Precision: 0.5470651872972009, Recall: 0.5468926553672316, F1-score: 0.5468000811611454  
Epoch 6/10 (Train): 100%|██████████| 1  
18/118 [00:09<00:00, 12.03sample/s]  
Epoch 6/10 (Eval): 100%|██████████|  
71/71 [00:03<00:00, 22.59sample/s]  
Epoch 6/10, Training Loss: 0.6697602474925783, Validation Loss: 0.6700952883999226  
Accuracy: 0.592090395480226, Precision: 0.5938263467903704, Recall: 0.592090395480226, F1-score: 0.589525674906131  
Epoch 7/10 (Train): 100%|██████████| 1  
18/118 [00:09<00:00, 12.10sample/s]  
Epoch 7/10 (Eval): 100%|██████████|  
71/71 [00:03<00:00, 22.90sample/s]  
Epoch 7/10, Training Loss: 0.6840148137516953, Validation Loss: 0.7866677378362181  
Accuracy: 0.5418079096045197, Precision: 0.541750979757917, Recall: 0.5418079096045197, F1-score: 0.5415425518261314  
Epoch 8/10 (Train): 100%|██████████| 1  
18/118 [00:09<00:00, 12.21sample/s]  
Epoch 8/10 (Eval): 100%|██████████|  
71/71 [00:03<00:00, 22.87sample/s]  
Epoch 8/10, Training Loss: 0.6671698139248363, Validation Loss: 0.6889776651468654  
Accuracy: 0.5774011299435028, Precision: 0.5777119388641012, Recall: 0.5774011299435028, F1-score: 0.577231118903825  
Epoch 9/10 (Train): 100%|██████████| 1  
18/118 [00:09<00:00, 12.34sample/s]  
Epoch 9/10 (Eval): 100%|██████████|  
71/71 [00:02<00:00, 23.83sample/s]  
Epoch 9/10, Training Loss: 0.6754542739115915, Validation Loss: 0.6619217987619551  
Accuracy: 0.5977401129943503, Precision: 0.6006849657451792, Recall: 0.5977401129943503, F1-score: 0.5954271143846396  
Epoch 10/10 (Train): 100%|██████████| 1  
18/118 [00:09<00:00, 12.43sample/s]  
Epoch 10/10 (Eval): 100%|██████████|  
71/71 [00:02<00:00, 23.94sample/s]
```

```
Epoch 10/10, Training Loss: 0.6663858142623491, Validation Loss: 0.6715278893204059
Accuracy: 0.5824858757062147, Precision: 0.5824651337363203, Recall: 0.5824858757062
147, F1-score: 0.5823934891323966
Тренировка завершена!
```

```
Test: 100%|██████████| 1
72/72 [00:03<00:00, 19.75sample/s]
Test Accuracy: 0.5819397993311036
Precision: 0.5822486410962334, Recall: 0.5819397993311036, F1-score: 0.5818046796799
502
Accuracy of cats : 60 %
Accuracy of dogs : 56 %
```

```
Class_name: cats
Train_count: 900
Test_count: 300
Valid_count: 300
Shutil images: 100%|██████████| 150
0/1500 [00:00<00:00, 1814.82image/s]
Class_name: dogs
Train_count: 900
Test_count: 300
Valid_count: 300
Shutil images: 100%|██████████| 150
0/1500 [00:00<00:00, 1828.58image/s]
```

---

```
-----  
Выбранная модель: densenet121  
Пользовательское название модели: densenet121_Exp3  
Выбранный оптимизатор: SGD
```

---

```
Epoch 1/10 (Train): 100%|██████████| 1
18/118 [00:19<00:00, 5.95sample/s]
Epoch 1/10 (Eval): 100%|██████████| 1
71/71 [00:05<00:00, 13.72sample/s]
Epoch 1/10, Training Loss: 0.6936994475692572, Validation Loss: 0.6952323475799992
Accuracy: 0.5180790960451978, Precision: 0.5368735642888185, Recall: 0.5180790960451
978, F1-score: 0.4358211609163549
Epoch 2/10 (Train): 100%|██████████| 1
18/118 [00:19<00:00, 6.01sample/s]
Epoch 2/10 (Eval): 100%|██████████| 1
71/71 [00:05<00:00, 13.59sample/s]
Epoch 2/10, Training Loss: 0.6813208430048056, Validation Loss: 0.6940627064408555
Accuracy: 0.535593220338983, Precision: 0.5410798212878305, Recall: 0.53559322033898
3, F1-score: 0.5231624138878177
Epoch 3/10 (Train): 100%|██████████| 1
18/118 [00:20<00:00, 5.89sample/s]
Epoch 3/10 (Eval): 100%|██████████| 1
71/71 [00:05<00:00, 13.87sample/s]
```

Epoch 3/10, Training Loss: 0.6834936174357173, Validation Loss: 0.6815655009221222  
Accuracy: 0.5457627118644067, Precision: 0.5922227213017814, Recall: 0.5457627118644  
067, F1-score: 0.4757632969922302

Epoch 4/10 (Train): 100% | ██████████ | 1  
18/118 [00:20<00:00, 5.86sample/s]

Epoch 4/10 (Eval): 100% | ██████████ |  
71/71 [00:05<00:00, 13.81sample/s]

Epoch 4/10, Training Loss: 0.6733749905678807, Validation Loss: 0.6781051953633627  
Accuracy: 0.6028248587570622, Precision: 0.6043138026820141, Recall: 0.6028248587570  
622, F1-score: 0.6018230305521388

Epoch 5/10 (Train): 100% | ██████████ | 1  
18/118 [00:19<00:00, 5.98sample/s]

Epoch 5/10 (Eval): 100% | ██████████ |  
71/71 [00:05<00:00, 13.77sample/s]

Epoch 5/10, Training Loss: 0.6683272430323121, Validation Loss: 0.671274029434064  
Accuracy: 0.588135593220339, Precision: 0.6308060999850386, Recall: 0.58813559322033  
9, F1-score: 0.5493135052673306

Epoch 6/10 (Train): 100% | ██████████ | 1  
18/118 [00:19<00:00, 5.97sample/s]

Epoch 6/10 (Eval): 100% | ██████████ |  
71/71 [00:05<00:00, 13.85sample/s]

Epoch 6/10, Training Loss: 0.6618808580642682, Validation Loss: 0.6739338505066047  
Accuracy: 0.5864406779661017, Precision: 0.6174792510321483, Recall: 0.5864406779661  
017, F1-score: 0.5592547379325449

Epoch 7/10 (Train): 100% | ██████████ | 1  
18/118 [00:19<00:00, 6.05sample/s]

Epoch 7/10 (Eval): 100% | ██████████ |  
71/71 [00:05<00:00, 14.09sample/s]

Epoch 7/10, Training Loss: 0.6604541296512397, Validation Loss: 0.6588523246474185  
Accuracy: 0.6214689265536724, Precision: 0.6316430670450996, Recall: 0.6214689265536  
724, F1-score: 0.6148623100244575

Epoch 8/10 (Train): 100% | ██████████ | 1  
18/118 [00:18<00:00, 6.26sample/s]

Epoch 8/10 (Eval): 100% | ██████████ |  
71/71 [00:05<00:00, 14.18sample/s]

Epoch 8/10, Training Loss: 0.6553157123285699, Validation Loss: 0.6625796788829869  
Accuracy: 0.6141242937853107, Precision: 0.6405657079297897, Recall: 0.6141242937853  
107, F1-score: 0.5936550876320629

Epoch 9/10 (Train): 100% | ██████████ | 1  
18/118 [00:19<00:00, 6.20sample/s]

Epoch 9/10 (Eval): 100% | ██████████ |  
71/71 [00:04<00:00, 14.23sample/s]

Epoch 9/10, Training Loss: 0.6506503837938107, Validation Loss: 0.6575129416029332  
Accuracy: 0.6271186440677966, Precision: 0.6589680825462733, Recall: 0.6271186440677  
966, F1-score: 0.6061637852173325

Epoch 10/10 (Train): 100% | ██████████ | 1  
18/118 [00:18<00:00, 6.29sample/s]

Epoch 10/10 (Eval): 100% | ██████████ |  
71/71 [00:04<00:00, 14.29sample/s]

Epoch 10/10, Training Loss: 0.6504289770036712, Validation Loss: 0.652266410111034  
Accuracy: 0.6299435028248588, Precision: 0.6335242689817304, Recall: 0.6299435028248  
588, F1-score: 0.6279105678049699

Тренировка завершена!

```
Test: 100%|██████████| 72/72 [00:05<00:00, 13.75sample/s]
Test Accuracy: 0.6465997770345596
Precision: 0.6487349617368056, Recall: 0.6465997770345596, F1-score: 0.6449351774916
156
Accuracy of  cats : 57 %
Accuracy of  dogs : 71 %

Class_name: cats
Train_count: 900
Test_count: 300
Valid_count: 300

Shutil images: 100%|██████████| 0/1500 [00:00<00:00, 1818.21image/s]
Class_name: dogs
Train_count: 900
Test_count: 300
Valid_count: 300

Shutil images: 100%|██████████| 0/1500 [00:00<00:00, 1804.36image/s]
```

Выбранная модель: densenet169  
Пользовательское название модели: densenet169\_Exp3  
Выбранный оптимизатор: SGD

```
Epoch 1/10 (Train): 100%|██████████| 1  
18/118 [00:25<00:00, 4.66sample/s]  
Epoch 1/10 (Eval): 100%|██████████|  
71/71 [00:06<00:00, 11.32sample/s]  
Epoch 1/10, Training Loss: 0.7002758771608891, Validation Loss: 0.7130982990318773  
Accuracy: 0.5028248587570622, Precision: 0.49488665364925793, Recall: 0.5028248587570622, F1-score: 0.354087500518999  
  
Epoch 2/10 (Train): 100%|██████████| 1  
18/118 [00:26<00:00, 4.42sample/s]  
Epoch 2/10 (Eval): 100%|██████████|  
71/71 [00:06<00:00, 10.21sample/s]  
Epoch 2/10, Training Loss: 0.6857811151631303, Validation Loss: 0.6918454197167003  
Accuracy: 0.5282485875706214, Precision: 0.5354915527170501, Recall: 0.5282485875706214, F1-score: 0.5082774001821602  
  
Epoch 3/10 (Train): 100%|██████████| 1  
18/118 [00:26<00:00, 4.42sample/s]  
Epoch 3/10 (Eval): 100%|██████████|  
71/71 [00:06<00:00, 10.32sample/s]  
Epoch 3/10, Training Loss: 0.6799710864940899, Validation Loss: 0.6836784047595525  
Accuracy: 0.5717514124293785, Precision: 0.5821253916056732, Recall: 0.5717514124293785, F1-score: 0.559619867591977
```

```
Epoch 4/10 (Train): 100%|██████████| 1  
18/118 [00:26<00:00, 4.41sample/s]  
Epoch 4/10 (Eval): 100%|██████████|  
71/71 [00:06<00:00, 10.28sample/s]  
Epoch 4/10, Training Loss: 0.6741972790135966, Validation Loss: 0.6795146913178223  
Accuracy: 0.5864406779661017, Precision: 0.5950410528844436, Recall: 0.5864406779661017, F1-score: 0.5781720097376519  
Epoch 5/10 (Train): 100%|██████████| 1  
18/118 [00:26<00:00, 4.39sample/s]  
Epoch 5/10 (Eval): 100%|██████████|  
71/71 [00:07<00:00, 10.08sample/s]  
Epoch 5/10, Training Loss: 0.6686672573617608, Validation Loss: 0.6757930759656228  
Accuracy: 0.5836158192090396, Precision: 0.6160768348914392, Recall: 0.5836158192090396, F1-score: 0.5544892794851021  
Epoch 6/10 (Train): 100%|██████████| 1  
18/118 [00:26<00:00, 4.44sample/s]  
Epoch 6/10 (Eval): 100%|██████████|  
71/71 [00:06<00:00, 10.35sample/s]  
Epoch 6/10, Training Loss: 0.6667906951798369, Validation Loss: 0.6709578956587839  
Accuracy: 0.603954802259887, Precision: 0.6155656215085459, Recall: 0.603954802259887, F1-score: 0.5948877254415292  
Epoch 7/10 (Train): 100%|██████████| 1  
18/118 [00:26<00:00, 4.39sample/s]  
Epoch 7/10 (Eval): 100%|██████████|  
71/71 [00:06<00:00, 10.38sample/s]  
Epoch 7/10, Training Loss: 0.6701227977148735, Validation Loss: 0.6616862086252978  
Accuracy: 0.615819209039548, Precision: 0.6250640933026717, Recall: 0.615819209039548, F1-score: 0.6094620725277563  
Epoch 8/10 (Train): 100%|██████████| 1  
18/118 [00:26<00:00, 4.42sample/s]  
Epoch 8/10 (Eval): 100%|██████████|  
71/71 [00:06<00:00, 10.24sample/s]  
Epoch 8/10, Training Loss: 0.6573886462498102, Validation Loss: 0.6778079055796908  
Accuracy: 0.5644067796610169, Precision: 0.6061251614060851, Recall: 0.5644067796610169, F1-score: 0.5199906016098337  
Epoch 9/10 (Train): 100%|██████████| 1  
18/118 [00:26<00:00, 4.42sample/s]  
Epoch 9/10 (Eval): 100%|██████████|  
71/71 [00:06<00:00, 10.27sample/s]  
Epoch 9/10, Training Loss: 0.665978509293626, Validation Loss: 0.6856025185457058  
Accuracy: 0.5508474576271186, Precision: 0.6503913103174724, Recall: 0.5508474576271186, F1-score: 0.4581762758698667  
Epoch 10/10 (Train): 100%|██████████| 1  
18/118 [00:26<00:00, 4.40sample/s]  
Epoch 10/10 (Eval): 100%|██████████|  
71/71 [00:06<00:00, 10.45sample/s]  
Epoch 00010: reducing learning rate of group 0 to 1.0000e-04.  
Epoch 10/10, Training Loss: 0.662015070816628, Validation Loss: 0.6665947832966929  
Accuracy: 0.5943502824858757, Precision: 0.6427968747684758, Recall: 0.5943502824858757, F1-score: 0.5546437472574187  
Тренировка завершена!  
Test: 100%|██████████|  
72/72 [00:07<00:00, 9.85sample/s]
```

```
Test Accuracy: 0.5914158305462653
Precision: 0.6484253181710549, Recall: 0.5914158305462653, F1-score: 0.5504885919092
424
Accuracy of cats : 89 %
Accuracy of dogs : 29 %
```

```
Class_name: cats
```

```
Train_count: 900
```

```
Test_count: 300
```

```
Valid_count: 300
```

```
Shutil images: 100%|██████████| 150
0/1500 [00:00<00:00, 1828.22image/s]
```

```
Class_name: dogs
```

```
Train_count: 900
```

```
Test_count: 300
```

```
Valid_count: 300
```

```
Shutil images: 100%|██████████| 150
0/1500 [00:00<00:00, 1841.44image/s]
```

---

```
-----
```

Выбранная модель: densenet201

Пользовательское название модели: densenet201\_Exp3

Выбранный оптимизатор: SGD

```
-----
```

```
Epoch 1/10 (Train): 100%|██████████| 1
18/118 [00:31<00:00,  3.74sample/s]
Epoch 1/10 (Eval): 100%|██████████| 1
71/71 [00:07<00:00,  9.18sample/s]
```

```
Epoch 1/10, Training Loss: 0.6969302922018733, Validation Loss: 0.6913870759939743
Accuracy: 0.5214689265536723, Precision: 0.5688208365160304, Recall: 0.5214689265536
723, F1-score: 0.41396855666413845
```

```
Epoch 2/10 (Train): 100%|██████████| 1
18/118 [00:31<00:00,  3.79sample/s]
Epoch 2/10 (Eval): 100%|██████████| 1
71/71 [00:07<00:00,  9.45sample/s]
```

```
Epoch 2/10, Training Loss: 0.6801430490517242, Validation Loss: 0.6933931752113299
Accuracy: 0.5418079096045197, Precision: 0.5929312344638193, Recall: 0.5418079096045
197, F1-score: 0.47333846942324587
```

```
Epoch 3/10 (Train): 100%|██████████| 1
18/118 [00:31<00:00,  3.74sample/s]
Epoch 3/10 (Eval): 100%|██████████| 1
71/71 [00:07<00:00,  9.14sample/s]
```

```
Epoch 3/10, Training Loss: 0.676533403436533, Validation Loss: 0.6878322219781283
Accuracy: 0.5700564971751413, Precision: 0.6107303014751722, Recall: 0.5700564971751
413, F1-score: 0.529365408964594
```

```
Epoch 4/10 (Train): 100%|██████████| 1
18/118 [00:31<00:00,  3.75sample/s]
Epoch 4/10 (Eval): 100%|██████████| 1
71/71 [00:07<00:00,  9.04sample/s]
```

Epoch 4/10, Training Loss: 0.6729105180937871, Validation Loss: 0.6927577875091531  
Accuracy: 0.5203389830508475, Precision: 0.6157573987789862, Recall: 0.5203389830508475, F1-score: 0.3899614925422192

Epoch 5/10 (Train): 100% | [██████████] | 1  
18/118 [00:31<00:00, 3.76sample/s]

Epoch 5/10 (Eval): 100% | [██████████] |  
71/71 [00:07<00:00, 9.22sample/s]

Epoch 5/10, Training Loss: 0.6675141331926243, Validation Loss: 0.673996524285462  
Accuracy: 0.6124293785310735, Precision: 0.6349515459294794, Recall: 0.6124293785310735, F1-score: 0.5968712234508595

Epoch 6/10 (Train): 100% | [██████████] | 1  
18/118 [00:31<00:00, 3.76sample/s]

Epoch 6/10 (Eval): 100% | [██████████] |  
71/71 [00:07<00:00, 9.25sample/s]

Epoch 6/10, Training Loss: 0.6632976736911583, Validation Loss: 0.6589326538608573  
Accuracy: 0.6237288135593221, Precision: 0.6446932156384445, Recall: 0.6237288135593221, F1-score: 0.6107047978322088

Epoch 7/10 (Train): 100% | [██████████] | 1  
18/118 [00:31<00:00, 3.78sample/s]

Epoch 7/10 (Eval): 100% | [██████████] |  
71/71 [00:07<00:00, 9.21sample/s]

Epoch 7/10, Training Loss: 0.6531882416647913, Validation Loss: 0.6588417798449091  
Accuracy: 0.6338983050847458, Precision: 0.6444379028062523, Recall: 0.6338983050847458, F1-score: 0.6278403279382149

Epoch 8/10 (Train): 100% | [██████████] | 1  
18/118 [00:31<00:00, 3.74sample/s]

Epoch 8/10 (Eval): 100% | [██████████] |  
71/71 [00:07<00:00, 9.09sample/s]

Epoch 8/10, Training Loss: 0.6521706787063418, Validation Loss: 0.6534243751380403  
Accuracy: 0.6231638418079096, Precision: 0.648828878549986, Recall: 0.6231638418079096, F1-score: 0.6073964390308958

Epoch 9/10 (Train): 100% | [██████████] | 1  
18/118 [00:31<00:00, 3.76sample/s]

Epoch 9/10 (Eval): 100% | [██████████] |  
71/71 [00:07<00:00, 9.15sample/s]

Epoch 9/10, Training Loss: 0.65329984773615, Validation Loss: 0.6611741822486543  
Accuracy: 0.5949152542372881, Precision: 0.67712317819572, Recall: 0.5949152542372881, F1-score: 0.5395631983586535

Epoch 10/10 (Train): 100% | [██████████] | 1  
18/118 [00:31<00:00, 3.77sample/s]

Epoch 10/10 (Eval): 100% | [██████████] |  
71/71 [00:07<00:00, 9.11sample/s]

Epoch 10/10, Training Loss: 0.6437749744113471, Validation Loss: 0.6459148167553594  
Accuracy: 0.632768361581921, Precision: 0.6687651690830364, Recall: 0.632768361581921, F1-score: 0.610824228621707

Тренировка завершена!

Test: 100% | [██████████] |  
72/72 [00:08<00:00, 8.71sample/s]

```
Test Accuracy: 0.6321070234113713
Precision: 0.6764106241193784, Recall: 0.6321070234113713, F1-score: 0.6089531438825
635
Accuracy of cats : 87 %
Accuracy of dogs : 38 %
```

```
Class_name: cats
Train_count: 900
Test_count: 300
Valid_count: 300
```

```
Shutil images: 100%|██████████| 150
0/1500 [00:00<00:00, 1826.78image/s]
```

```
Class_name: dogs
Train_count: 900
Test_count: 300
Valid_count: 300
```

```
Shutil images: 100%|██████████| 150
0/1500 [00:00<00:00, 1849.50image/s]
```

---

```
-----  
Выбранная модель: efficientnet_b0
Пользовательское название модели: efficientnet_b0_Exp3
Выбранный оптимизатор: AdamW
```

---

```
Epoch 1/10 (Train): 100%|██████████| 1
18/118 [00:17<00:00, 6.83sample/s]
Epoch 1/10 (Eval): 100%|██████████| 1
71/71 [00:03<00:00, 18.99sample/s]
```

```
Epoch 1/10, Training Loss: 0.7379316492840108, Validation Loss: 0.6911301749237513
Accuracy: 0.4971751412429379, Precision: 0.7501509039867397, Recall: 0.4971751412429
379, F1-score: 0.3308268179758882
```

```
Epoch 2/10 (Train): 100%|██████████| 1
18/118 [00:17<00:00, 6.72sample/s]
Epoch 2/10 (Eval): 100%|██████████| 1
71/71 [00:03<00:00, 18.91sample/s]
```

```
Epoch 2/10, Training Loss: 0.7265227592651435, Validation Loss: 0.7124394974802847
Accuracy: 0.5299435028248588, Precision: 0.588539783844864, Recall: 0.52994350282485
88, F1-score: 0.43069557627646954
```

```
Epoch 3/10 (Train): 100%|██████████| 1
18/118 [00:17<00:00, 6.93sample/s]
Epoch 3/10 (Eval): 100%|██████████| 1
71/71 [00:03<00:00, 18.71sample/s]
```

```
Epoch 3/10, Training Loss: 0.6742176899988197, Validation Loss: 0.6555216450475704
Accuracy: 0.6096045197740113, Precision: 0.6805957773232029, Recall: 0.6096045197740
113, F1-score: 0.5652097201286237
```

```
Epoch 4/10 (Train): 100%|██████████| 1
18/118 [00:17<00:00, 6.94sample/s]
Epoch 4/10 (Eval): 100%|██████████| 1
71/71 [00:03<00:00, 19.15sample/s]
```

Epoch 4/10, Training Loss: 0.6488470809148422, Validation Loss: 0.639534140037278  
Accuracy: 0.6587570621468927, Precision: 0.7022006875184605, Recall: 0.6587570621468927, F1-score: 0.6383658985961709

Epoch 5/10 (Train): 100% | ██████████ | 1  
18/118 [00:17<00:00, 6.91sample/s]

Epoch 5/10 (Eval): 100% | ██████████ |  
71/71 [00:03<00:00, 18.91sample/s]

Epoch 5/10, Training Loss: 0.6371143187917591, Validation Loss: 0.6010832661962778  
Accuracy: 0.6926553672316385, Precision: 0.7061017791353319, Recall: 0.6926553672316385, F1-score: 0.6880165408978969

Epoch 6/10 (Train): 100% | ██████████ | 1  
18/118 [00:17<00:00, 6.92sample/s]

Epoch 6/10 (Eval): 100% | ██████████ |  
71/71 [00:03<00:00, 19.10sample/s]

Epoch 6/10, Training Loss: 0.6208969870008024, Validation Loss: 0.5740864459572539  
Accuracy: 0.7192090395480226, Precision: 0.7192051049511512, Recall: 0.7192090395480226, F1-score: 0.7192050060644277

Epoch 7/10 (Train): 100% | ██████████ | 1  
18/118 [00:17<00:00, 6.86sample/s]

Epoch 7/10 (Eval): 100% | ██████████ |  
71/71 [00:03<00:00, 18.63sample/s]

Epoch 7/10, Training Loss: 0.6099449862520416, Validation Loss: 0.6669783121616827  
Accuracy: 0.6943502824858757, Precision: 0.7008593016153793, Recall: 0.6943502824858757, F1-score: 0.6921736294273374

Epoch 8/10 (Train): 100% | ██████████ | 1  
18/118 [00:17<00:00, 6.93sample/s]

Epoch 8/10 (Eval): 100% | ██████████ |  
71/71 [00:03<00:00, 18.88sample/s]

Epoch 8/10, Training Loss: 0.5909805712293291, Validation Loss: 0.5660241110681814  
Accuracy: 0.735593220338983, Precision: 0.7365599415110189, Recall: 0.735593220338983, F1-score: 0.7352280218081267

Epoch 9/10 (Train): 100% | ██████████ | 1  
18/118 [00:17<00:00, 6.81sample/s]

Epoch 9/10 (Eval): 100% | ██████████ |  
71/71 [00:03<00:00, 19.15sample/s]

Epoch 9/10, Training Loss: 0.5621243715795522, Validation Loss: 0.8441610294630972  
Accuracy: 0.7203389830508474, Precision: 0.7208511398511821, Recall: 0.7203389830508474, F1-score: 0.7202449642214646

Epoch 10/10 (Train): 100% | ██████████ | 1  
18/118 [00:16<00:00, 6.97sample/s]

Epoch 10/10 (Eval): 100% | ██████████ |  
71/71 [00:03<00:00, 19.03sample/s]

Epoch 10/10, Training Loss: 0.5542467855278629, Validation Loss: 0.7202532767912763  
Accuracy: 0.7367231638418079, Precision: 0.7465799607538963, Recall: 0.7367231638418079, F1-score: 0.7343343420805226

Тренировка завершена!

Test: 100% | ██████████ |  
72/72 [00:04<00:00, 17.35sample/s]

```
Test Accuracy: 0.7486064659977704
Precision: 0.7583075185848059, Recall: 0.7486064659977704, F1-score: 0.7459355101847
518
Accuracy of cats : 64 %
Accuracy of dogs : 84 %
```

```
Class_name: cats
Train_count: 900
Test_count: 300
Valid_count: 300
```

```
Shutil images: 100%|██████████| 150
0/1500 [00:00<00:00, 1839.73image/s]
```

```
Class_name: dogs
Train_count: 900
Test_count: 300
Valid_count: 300
```

```
Shutil images: 100%|██████████| 150
0/1500 [00:00<00:00, 1835.87image/s]
```

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```
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```

Выбранная модель: efficientnet\_b1

Пользовательское название модели: efficientnet\_b1\_Exp3

Выбранный оптимизатор: AdamW

```
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```

```
Epoch 1/10 (Train): 100%|██████████| 1
18/118 [00:21<00:00, 5.37sample/s]
Epoch 1/10 (Eval): 100%|██████████| 1
71/71 [00:04<00:00, 16.60sample/s]
```

```
Epoch 1/10, Training Loss: 0.7629931305298965, Validation Loss: 0.7263802050028817
Accuracy: 0.503954802259887, Precision: 0.5164727153394352, Recall: 0.503954802259887,
F1-score: 0.34620439557974014
```

```
Epoch 2/10 (Train): 100%|██████████| 1
18/118 [00:21<00:00, 5.43sample/s]
Epoch 2/10 (Eval): 100%|██████████| 1
71/71 [00:04<00:00, 16.29sample/s]
```

```
Epoch 2/10, Training Loss: 0.7078191230986433, Validation Loss: 0.699703036055053
Accuracy: 0.5056497175141242, Precision: 0.6016101694915253, Recall: 0.5056497175141242,
F1-score: 0.34505953827998803
```

```
Epoch 3/10 (Train): 100%|██████████| 1
18/118 [00:22<00:00, 5.32sample/s]
Epoch 3/10 (Eval): 100%|██████████| 1
71/71 [00:04<00:00, 16.39sample/s]
```

```
Epoch 3/10, Training Loss: 0.7000973176361353, Validation Loss: 1.5860588171724546
Accuracy: 0.5468926553672316, Precision: 0.5892004919094855, Recall: 0.5468926553672316,
F1-score: 0.48146400683352203
```

```
Epoch 4/10 (Train): 100%|██████████| 1
18/118 [00:21<00:00, 5.37sample/s]
Epoch 4/10 (Eval): 100%|██████████| 1
71/71 [00:04<00:00, 16.60sample/s]
```

Epoch 4/10, Training Loss: 0.7111127179775512, Validation Loss: 0.7926435221386494  
Accuracy: 0.615819209039548, Precision: 0.6188456091322643, Recall: 0.615819209039548, F1-score: 0.6138678145457807

Epoch 5/10 (Train): 100% | 18/118 [00:21<00:00, 5.42sample/s]

Epoch 5/10 (Eval): 100% | 71/71 [00:04<00:00, 16.48sample/s]

Epoch 5/10, Training Loss: 0.6917373319032334, Validation Loss: 0.6714550052995736  
Accuracy: 0.6067796610169491, Precision: 0.65695539250396, Recall: 0.6067796610169491, F1-score: 0.570800096638078

Epoch 6/10 (Train): 100% | 18/118 [00:22<00:00, 5.36sample/s]

Epoch 6/10 (Eval): 100% | 71/71 [00:04<00:00, 16.41sample/s]

Epoch 6/10, Training Loss: 0.6863273654543042, Validation Loss: 0.8850408964237925  
Accuracy: 0.5689265536723164, Precision: 0.6244913629198693, Recall: 0.5689265536723164, F1-score: 0.5117554636082078

Epoch 7/10 (Train): 100% | 18/118 [00:21<00:00, 5.42sample/s]

Epoch 7/10 (Eval): 100% | 71/71 [00:04<00:00, 16.25sample/s]

Epoch 7/10, Training Loss: 0.6634791545361097, Validation Loss: 0.828098550691443  
Accuracy: 0.566666666666666667, Precision: 0.567431867013457, Recall: 0.566666666666666667, F1-score: 0.5659734552166652

Epoch 8/10 (Train): 100% | 18/118 [00:21<00:00, 5.38sample/s]

Epoch 8/10 (Eval): 100% | 71/71 [00:04<00:00, 16.62sample/s]

Epoch 00008: reducing learning rate of group 0 to 1.0000e-04.

Epoch 8/10, Training Loss: 0.6619618196277202, Validation Loss: 0.7141224207346049  
Accuracy: 0.5813559322033899, Precision: 0.5959322845898587, Recall: 0.5813559322033899, F1-score: 0.5665862282868105

Epoch 9/10 (Train): 100% | 18/118 [00:22<00:00, 5.32sample/s]

Epoch 9/10 (Eval): 100% | 71/71 [00:04<00:00, 16.60sample/s]

Epoch 9/10, Training Loss: 0.6516465405772504, Validation Loss: 0.6641283450321963  
Accuracy: 0.6209039548022599, Precision: 0.6329997277638288, Recall: 0.6209039548022599, F1-score: 0.6130091723052784

Epoch 10/10 (Train): 100% | 18/118 [00:21<00:00, 5.38sample/s]

Epoch 10/10 (Eval): 100% | 71/71 [00:04<00:00, 16.36sample/s]

Epoch 10/10, Training Loss: 0.6355113297782364, Validation Loss: 0.6622332796706991  
Accuracy: 0.6480225988700565, Precision: 0.6497749882193242, Recall: 0.6480225988700565, F1-score: 0.6472512130369472

Тренировка завершена!

Test: 100% | 72/72 [00:04<00:00, 15.63sample/s]

```
Test Accuracy: 0.644927536231884
Precision: 0.6458158028321018, Recall: 0.644927536231884, F1-score: 0.64411479775693
1
Accuracy of cats : 59 %
Accuracy of dogs : 69 %
```

```
Class_name: cats
```

```
Train_count: 900
```

```
Test_count: 300
```

```
Valid_count: 300
```

```
Shutil images: 100%|██████████| 150
0/1500 [00:00<00:00, 1853.64image/s]
```

```
Class_name: dogs
```

```
Train_count: 900
```

```
Test_count: 300
```

```
Valid_count: 300
```

```
Shutil images: 100%|██████████| 150
0/1500 [00:00<00:00, 1866.16image/s]
```

---

```
-----
```

Выбранная модель: efficientnet\_b2

Пользовательское название модели: efficientnet\_b2\_Exp3

Выбранный оптимизатор: AdamW

```
-----
```

```
Epoch 1/10 (Train): 100%|██████████| 1
18/118 [00:22<00:00, 5.28sample/s]
Epoch 1/10 (Eval): 100%|██████████| 1
71/71 [00:04<00:00, 16.89sample/s]
```

```
Epoch 1/10, Training Loss: 0.7496337472210987, Validation Loss: 0.7233480103945328
Accuracy: 0.5005649717514125, Precision: 0.32363858105611853, Recall: 0.500564971751
4125, F1-score: 0.3368406846089726
```

```
Epoch 2/10 (Train): 100%|██████████| 1
18/118 [00:22<00:00, 5.35sample/s]
Epoch 2/10 (Eval): 100%|██████████| 1
71/71 [00:04<00:00, 16.78sample/s]
```

```
Epoch 2/10, Training Loss: 0.7251845198140434, Validation Loss: 0.7358518164541762
Accuracy: 0.5028248587570622, Precision: 0.4850239026510213, Recall: 0.5028248587570
622, F1-score: 0.3437506045530486
```

```
Epoch 3/10 (Train): 100%|██████████| 1
18/118 [00:22<00:00, 5.23sample/s]
Epoch 3/10 (Eval): 100%|██████████| 1
71/71 [00:04<00:00, 16.73sample/s]
```

```
Epoch 3/10, Training Loss: 0.7387536098226977, Validation Loss: 0.7338538025058595
Accuracy: 0.4966101694915254, Precision: 0.2466216604424016, Recall: 0.4966101694915
254, F1-score: 0.329573679866403
```

```
Epoch 4/10 (Train): 100%|██████████| 1
18/118 [00:21<00:00, 5.39sample/s]
Epoch 4/10 (Eval): 100%|██████████| 1
71/71 [00:04<00:00, 16.86sample/s]
```

Epoch 4/10, Training Loss: 0.7144967213283234, Validation Loss: 0.7145794067679152  
Accuracy: 0.5016949152542373, Precision: 0.4839880595216277, Recall: 0.5016949152542  
373, F1-score: 0.35534351392676633

Epoch 5/10 (Train): 100% | ██████████ | 1  
18/118 [00:21<00:00, 5.38sample/s]  
Epoch 5/10 (Eval): 100% | ██████████ |  
71/71 [00:04<00:00, 16.41sample/s]

Epoch 5/10, Training Loss: 0.6996620759031826, Validation Loss: 0.7057443754484425  
Accuracy: 0.5282485875706214, Precision: 0.5484790451273218, Recall: 0.5282485875706  
214, F1-score: 0.465682584682639

Epoch 6/10 (Train): 100% | ██████████ | 1  
18/118 [00:22<00:00, 5.31sample/s]  
Epoch 6/10 (Eval): 100% | ██████████ |  
71/71 [00:04<00:00, 16.50sample/s]

Epoch 6/10, Training Loss: 0.7048601120690002, Validation Loss: 0.7042741267021093  
Accuracy: 0.492090395480226, Precision: 0.44706693092764715, Recall: 0.4920903954802  
26, F1-score: 0.3656681991811341

Epoch 7/10 (Train): 100% | ██████████ | 1  
18/118 [00:21<00:00, 5.41sample/s]  
Epoch 7/10 (Eval): 100% | ██████████ |  
71/71 [00:04<00:00, 16.46sample/s]

Epoch 7/10, Training Loss: 0.701059964447908, Validation Loss: 0.7105825496258709  
Accuracy: 0.5011299435028248, Precision: 0.4459703841291953, Recall: 0.5011299435028  
248, F1-score: 0.3429631806327411

Epoch 8/10 (Train): 100% | ██████████ | 1  
18/118 [00:22<00:00, 5.32sample/s]  
Epoch 8/10 (Eval): 100% | ██████████ |  
71/71 [00:04<00:00, 16.43sample/s]

Epoch 8/10, Training Loss: 0.7003163817355833, Validation Loss: 0.7137120564778646  
Accuracy: 0.47401129943502823, Precision: 0.424955902660794, Recall: 0.4740112994350  
2823, F1-score: 0.37717877564215213

Epoch 9/10 (Train): 100% | ██████████ | 1  
18/118 [00:22<00:00, 5.31sample/s]  
Epoch 9/10 (Eval): 100% | ██████████ |  
71/71 [00:04<00:00, 16.86sample/s]

Epoch 9/10, Training Loss: 0.7152770795972072, Validation Loss: 0.6995420395317724  
Accuracy: 0.5022598870056497, Precision: 0.4980487828482577, Recall: 0.5022598870056  
497, F1-score: 0.3954287039015114

Epoch 10/10 (Train): 100% | ██████████ | 1  
18/118 [00:21<00:00, 5.43sample/s]  
Epoch 10/10 (Eval): 100% | ██████████ |  
71/71 [00:04<00:00, 16.43sample/s]

Epoch 10/10, Training Loss: 0.7059213210480391, Validation Loss: 0.6941817076192738  
Accuracy: 0.5073446327683616, Precision: 0.5312922726893613, Recall: 0.5073446327683  
616, F1-score: 0.3704856167993564

Тренировка завершена!

Test: 100% | ██████████ |  
72/72 [00:04<00:00, 15.55sample/s]

```
Test Accuracy: 0.5027870680044593
Precision: 0.5518420114650225, Recall: 0.5027870680044593, F1-score: 0.3642498981748
6253
Accuracy of cats : 97 %
Accuracy of dogs : 3 %
```

```
Class_name: cats
Train_count: 900
Test_count: 300
Valid_count: 300
```

```
Shutil images: 100%|██████████| 150
0/1500 [00:00<00:00, 1841.49image/s]
```

```
Class_name: dogs
Train_count: 900
Test_count: 300
Valid_count: 300
```

```
Shutil images: 100%|██████████| 150
0/1500 [00:00<00:00, 1857.91image/s]
```

---

```
-----  
Выбранная модель: efficientnet_b3  
Пользовательское название модели: efficientnet_b3_Exp3  
Выбранный оптимизатор: AdamW
```

---

```
Epoch 1/10 (Train): 100%|██████████| 1
18/118 [00:24<00:00, 4.88sample/s]
Epoch 1/10 (Eval): 100%|██████████| 1
71/71 [00:04<00:00, 15.68sample/s]
```

```
Epoch 1/10, Training Loss: 0.7689464438556403, Validation Loss: 0.7193466832408797
Accuracy: 0.5050847457627119, Precision: 0.5345487094625633, Recall: 0.5050847457627
119, F1-score: 0.3505440009851479
```

```
Epoch 2/10 (Train): 100%|██████████| 1
18/118 [00:24<00:00, 4.89sample/s]
Epoch 2/10 (Eval): 100%|██████████| 1
71/71 [00:04<00:00, 15.90sample/s]
```

```
Epoch 2/10, Training Loss: 0.7315147685743894, Validation Loss: 2.5766330994455156
Accuracy: 0.5124293785310734, Precision: 0.5183739973288284, Recall: 0.5124293785310
734, F1-score: 0.45063051377298313
```

```
Epoch 3/10 (Train): 100%|██████████| 1
18/118 [00:23<00:00, 5.02sample/s]
Epoch 3/10 (Eval): 100%|██████████| 1
71/71 [00:04<00:00, 15.61sample/s]
```

```
Epoch 3/10, Training Loss: 0.7105554972131694, Validation Loss: 0.7103605022874929
Accuracy: 0.5056497175141242, Precision: 0.5239276621864458, Recall: 0.5056497175141
242, F1-score: 0.36179534364711147
```

```
Epoch 4/10 (Train): 100%|██████████| 1
18/118 [00:24<00:00, 4.82sample/s]
Epoch 4/10 (Eval): 100%|██████████| 1
71/71 [00:04<00:00, 15.37sample/s]
```

Epoch 4/10, Training Loss: 0.6968583157025049, Validation Loss: 1.0079783487454645  
Accuracy: 0.5327683615819209, Precision: 0.534338697841058, Recall: 0.5327683615819209, F1-score: 0.5295304795980355

Epoch 5/10 (Train): 100% | 18/118 [00:24<00:00, 4.87sample/s]

Epoch 5/10 (Eval): 100% | 71/71 [00:04<00:00, 15.59sample/s]

Epoch 5/10, Training Loss: 0.713410136130112, Validation Loss: 0.724391358552006  
Accuracy: 0.5169491525423728, Precision: 0.5185946237650567, Recall: 0.5169491525423728, F1-score: 0.5112677602906546

Epoch 6/10 (Train): 100% | 18/118 [00:24<00:00, 4.84sample/s]

Epoch 6/10 (Eval): 100% | 71/71 [00:04<00:00, 15.68sample/s]

Epoch 00006: reducing learning rate of group 0 to 1.0000e-04.

Epoch 6/10, Training Loss: 0.7165578210590151, Validation Loss: 6.251671911969697  
Accuracy: 0.4966101694915254, Precision: 0.48928179490306056, Recall: 0.4966101694915254, F1-score: 0.42934627901003625

Epoch 7/10 (Train): 100% | 18/118 [00:24<00:00, 4.90sample/s]

Epoch 7/10 (Eval): 100% | 71/71 [00:04<00:00, 15.63sample/s]

Epoch 7/10, Training Loss: 0.6997016506780115, Validation Loss: 0.829558098720292  
Accuracy: 0.5045197740112994, Precision: 0.5043866814327626, Recall: 0.5045197740112994, F1-score: 0.4278911635216402

Epoch 8/10 (Train): 100% | 18/118 [00:23<00:00, 4.92sample/s]

Epoch 8/10 (Eval): 100% | 71/71 [00:04<00:00, 15.46sample/s]

Epoch 8/10, Training Loss: 0.6964392247301051, Validation Loss: 1.0183175468848924  
Accuracy: 0.5316384180790961, Precision: 0.5466500578288415, Recall: 0.5316384180790961, F1-score: 0.48405502370034814

Epoch 9/10 (Train): 100% | 18/118 [00:24<00:00, 4.87sample/s]

Epoch 9/10 (Eval): 100% | 71/71 [00:04<00:00, 15.41sample/s]

Epoch 00009: reducing learning rate of group 0 to 1.0000e-05.

Epoch 9/10, Training Loss: 0.6976986660056137, Validation Loss: 0.7346006126727088  
Accuracy: 0.5259887005649717, Precision: 0.5371555549330268, Recall: 0.5259887005649717, F1-score: 0.47939724504636916

Epoch 10/10 (Train): 100% | 18/118 [00:24<00:00, 4.92sample/s]

Epoch 10/10 (Eval): 100% | 71/71 [00:04<00:00, 15.67sample/s]

Epoch 10/10, Training Loss: 0.6961127023784901, Validation Loss: 0.7298551159726698  
Accuracy: 0.5220338983050847, Precision: 0.5315734598461083, Recall: 0.5220338983050847, F1-score: 0.47327500902791314

Тренировка завершена!

Test: 100% | 72/72 [00:04<00:00, 14.59sample/s]

```
Test Accuracy: 0.5217391304347826
Precision: 0.5395466074714079, Recall: 0.5217391304347826, F1-score: 0.4708612916416
368
Accuracy of cats : 83 %
Accuracy of dogs : 21 %
```

```
Class_name: cats
```

```
Train_count: 900
```

```
Test_count: 300
```

```
Valid_count: 300
```

```
Shutil images: 100%|██████████| 150
0/1500 [00:00<00:00, 1828.13image/s]
```

```
Class_name: dogs
```

```
Train_count: 900
```

```
Test_count: 300
```

```
Valid_count: 300
```

```
Shutil images: 100%|██████████| 150
0/1500 [00:00<00:00, 1829.04image/s]
```

---

```
-----
```

Выбранная модель: efficientnet\_b4

Пользовательское название модели: efficientnet\_b4\_Exp3

Выбранный оптимизатор: AdamW

```
-----
```

```
Epoch 1/10 (Train): 100%|██████████| 1
18/118 [00:29<00:00, 3.97sample/s]
Epoch 1/10 (Eval): 100%|██████████| 1
71/71 [00:05<00:00, 13.63sample/s]
```

```
Epoch 1/10, Training Loss: 0.7520789758888565, Validation Loss: 0.7511376188804875
Accuracy: 0.503954802259887, Precision: 0.5846201068554383, Recall: 0.50395480225988
7, F1-score: 0.3393605141996859
```

```
Epoch 2/10 (Train): 100%|██████████| 1
18/118 [00:29<00:00, 4.02sample/s]
Epoch 2/10 (Eval): 100%|██████████| 1
71/71 [00:05<00:00, 13.43sample/s]
```

```
Epoch 2/10, Training Loss: 0.726737882939415, Validation Loss: 1.2949765623457687
Accuracy: 0.5028248587570622, Precision: 0.48697319336912254, Recall: 0.50282485875
70622, F1-score: 0.34471511174279196
```

```
Epoch 3/10 (Train): 100%|██████████| 1
18/118 [00:29<00:00, 3.98sample/s]
Epoch 3/10 (Eval): 100%|██████████| 1
71/71 [00:05<00:00, 13.64sample/s]
```

```
Epoch 3/10, Training Loss: 0.7286053304792836, Validation Loss: 1.7581655645774583
Accuracy: 0.503954802259887, Precision: 0.5294475083173723, Recall: 0.50395480225988
7, F1-score: 0.3423245682218763
```

```
Epoch 4/10 (Train): 100%|██████████| 1
18/118 [00:29<00:00, 4.06sample/s]
Epoch 4/10 (Eval): 100%|██████████| 1
71/71 [00:05<00:00, 13.49sample/s]
```

```
Epoch 4/10, Training Loss: 0.7087547726526867, Validation Loss: 0.7124000208526008
Accuracy: 0.5062146892655367, Precision: 0.5278234903608968, Recall: 0.5062146892655
367, F1-score: 0.36384838823288285
Epoch 5/10 (Train): 100%|██████████| 1
18/118 [00:29<00:00, 4.02sample/s]
Epoch 5/10 (Eval): 100%|██████████| 1
71/71 [00:05<00:00, 13.51sample/s]
Epoch 5/10, Training Loss: 0.6963615191773201, Validation Loss: 0.6772590520354987
Accuracy: 0.5423728813559322, Precision: 0.6217670726866396, Recall: 0.5423728813559
322, F1-score: 0.4488859445200486
Epoch 6/10 (Train): 100%|██████████| 1
18/118 [00:29<00:00, 3.97sample/s]
Epoch 6/10 (Eval): 100%|██████████| 1
71/71 [00:05<00:00, 13.45sample/s]
Epoch 6/10, Training Loss: 0.7200374431953964, Validation Loss: 0.6885962764085349
Accuracy: 0.5610169491525424, Precision: 0.5907029090034861, Recall: 0.5610169491525
424, F1-score: 0.5185821934457384
Epoch 7/10 (Train): 100%|██████████| 1
18/118 [00:29<00:00, 4.02sample/s]
Epoch 7/10 (Eval): 100%|██████████| 1
71/71 [00:05<00:00, 13.78sample/s]
Epoch 7/10, Training Loss: 0.7054852250701177, Validation Loss: 0.6776553592776174
Accuracy: 0.5751412429378531, Precision: 0.6002109952669873, Recall: 0.5751412429378
531, F1-score: 0.5443138389959788
Epoch 8/10 (Train): 100%|██████████| 1
18/118 [00:29<00:00, 3.98sample/s]
Epoch 8/10 (Eval): 100%|██████████| 1
71/71 [00:05<00:00, 13.58sample/s]
Epoch 00008: reducing learning rate of group 0 to 1.0000e-04.

Epoch 8/10, Training Loss: 0.7067077648370785, Validation Loss: 0.6788996389019961
Accuracy: 0.5740112994350283, Precision: 0.5795662447718549, Recall: 0.5740112994350
283, F1-score: 0.5649055785399706
Epoch 9/10 (Train): 100%|██████████| 1
18/118 [00:28<00:00, 4.11sample/s]
Epoch 9/10 (Eval): 100%|██████████| 1
71/71 [00:05<00:00, 13.55sample/s]
Epoch 9/10, Training Loss: 0.6792577571723857, Validation Loss: 0.6772089961726787
Accuracy: 0.584180790960452, Precision: 0.5979586368594847, Recall: 0.58418079096045
2, F1-score: 0.5672413014263417
Epoch 10/10 (Train): 100%|██████████| 1
18/118 [00:29<00:00, 4.05sample/s]
Epoch 10/10 (Eval): 100%|██████████| 1
71/71 [00:05<00:00, 13.78sample/s]
Epoch 10/10, Training Loss: 0.6724152342961899, Validation Loss: 0.6481687605886136
Accuracy: 0.6429378531073446, Precision: 0.6484725103522692, Recall: 0.6429378531073
446, F1-score: 0.6390383950190246
Тренировка завершена!
Test: 100%|██████████| 1
72/72 [00:05<00:00, 12.85sample/s]
```

```
Test Accuracy: 0.649386845039019
Precision: 0.6547187127441558, Recall: 0.649386845039019, F1-score: 0.64685874143031
02
Accuracy of cats : 73 %
Accuracy of dogs : 56 %
```

```
Class_name: cats
```

```
Train_count: 900
```

```
Test_count: 300
```

```
Valid_count: 300
```

```
Shutil images: 100%|██████████| 150
0/1500 [00:00<00:00, 1821.95image/s]
```

```
Class_name: dogs
```

```
Train_count: 900
```

```
Test_count: 300
```

```
Valid_count: 300
```

```
Shutil images: 100%|██████████| 150
0/1500 [00:00<00:00, 1811.60image/s]
```

---

```
Выбранная модель: efficientnet_v2_s
```

```
Пользовательское название модели: efficientnet_v2_s_Exp3
```

```
Выбранный оптимизатор: AdamW
```

---

```
Epoch 1/10 (Train): 100%|██████████| 1
18/118 [00:31<00:00, 3.75sample/s]
Epoch 1/10 (Eval): 100%|██████████| 1
71/71 [00:05<00:00, 12.76sample/s]
```

```
Epoch 1/10, Training Loss: 0.7386375120137542, Validation Loss: 0.7076020740856559
Accuracy: 0.4971751412429379, Precision: 0.5020420169851104, Recall: 0.4971751412429
379, F1-score: 0.36200441794770727
```

```
Epoch 2/10 (Train): 100%|██████████| 1
18/118 [00:31<00:00, 3.75sample/s]
Epoch 2/10 (Eval): 100%|██████████| 1
71/71 [00:05<00:00, 12.83sample/s]
```

```
Epoch 2/10, Training Loss: 0.7390416694763011, Validation Loss: 1.4977716212555514
Accuracy: 0.48983050847457626, Precision: 0.48371637017272523, Recall: 0.48983050847
457626, F1-score: 0.41304459632541474
```

```
Epoch 3/10 (Train): 100%|██████████| 1
18/118 [00:31<00:00, 3.72sample/s]
Epoch 3/10 (Eval): 100%|██████████| 1
71/71 [00:05<00:00, 12.76sample/s]
```

```
Epoch 3/10, Training Loss: 0.7223492575196966, Validation Loss: 0.8182473559837556
Accuracy: 0.5067796610169492, Precision: 0.5274799286351473, Recall: 0.5067796610169
492, F1-score: 0.3693375052440873
```

```
Epoch 4/10 (Train): 100%|██████████| 1
18/118 [00:31<00:00, 3.76sample/s]
Epoch 4/10 (Eval): 100%|██████████| 1
71/71 [00:05<00:00, 12.91sample/s]
```

Epoch 00004: reducing learning rate of group 0 to 1.0000e-04.

Epoch 4/10, Training Loss: 0.7098403243438397, Validation Loss: 0.9009946766546217  
Accuracy: 0.5028248587570622, Precision: 0.48851249012288633, Recall: 0.502824858757  
0622, F1-score: 0.3456745668640237

Epoch 5/10 (Train): 100% | ██████████ | 1  
18/118 [00:31<00:00, 3.78sample/s]  
Epoch 5/10 (Eval): 100% | ██████████ |  
71/71 [00:05<00:00, 12.95sample/s]

Epoch 5/10, Training Loss: 0.7008109771667567, Validation Loss: 0.7315631534083414  
Accuracy: 0.5011299435028248, Precision: 0.45148958837772396, Recall: 0.501129943502  
8248, F1-score: 0.3439233840244508

Epoch 6/10 (Train): 100% | ██████████ | 1  
18/118 [00:31<00:00, 3.70sample/s]  
Epoch 6/10 (Eval): 100% | ██████████ |  
71/71 [00:05<00:00, 12.88sample/s]

Epoch 6/10, Training Loss: 0.7005961471767517, Validation Loss: 0.7967457321740813  
Accuracy: 0.507909604519774, Precision: 0.5330517517017875, Recall: 0.50790960451977  
4, F1-score: 0.37331730532475127

Epoch 7/10 (Train): 100% | ██████████ | 1  
18/118 [00:31<00:00, 3.73sample/s]  
Epoch 7/10 (Eval): 100% | ██████████ |  
71/71 [00:05<00:00, 12.85sample/s]

Epoch 00007: reducing learning rate of group 0 to 1.0000e-05.

Epoch 7/10, Training Loss: 0.6981039986533819, Validation Loss: 0.7597973333240229  
Accuracy: 0.49265536723163844, Precision: 0.4730847906390208, Recall: 0.492655367231  
63844, F1-score: 0.35795507956941525

Epoch 8/10 (Train): 100% | ██████████ | 1  
18/118 [00:31<00:00, 3.72sample/s]  
Epoch 8/10 (Eval): 100% | ██████████ |  
71/71 [00:05<00:00, 12.90sample/s]

Epoch 8/10, Training Loss: 0.6988660190216255, Validation Loss: 0.722140645913485  
Accuracy: 0.503954802259887, Precision: 0.5098914020519828, Recall: 0.50395480225988  
7, F1-score: 0.35280123112049383

Epoch 9/10 (Train): 100% | ██████████ | 1  
18/118 [00:31<00:00, 3.74sample/s]  
Epoch 9/10 (Eval): 100% | ██████████ |  
71/71 [00:05<00:00, 12.71sample/s]

Epoch 9/10, Training Loss: 0.6956556149524772, Validation Loss: 0.7095884493852066  
Accuracy: 0.5112994350282486, Precision: 0.5599003115304686, Recall: 0.511299435028  
486, F1-score: 0.3759602598810133

Epoch 10/10 (Train): 100% | ██████████ | 1  
18/118 [00:32<00:00, 3.64sample/s]  
Epoch 10/10 (Eval): 100% | ██████████ |  
71/71 [00:05<00:00, 12.76sample/s]

Epoch 00010: reducing learning rate of group 0 to 1.0000e-06.

Epoch 10/10, Training Loss: 0.7031337099171467, Validation Loss: 0.7134226146390883  
Accuracy: 0.5062146892655367, Precision: 0.5186510627138536, Recall: 0.5062146892655  
367, F1-score: 0.3757218928987097

Тренировка завершена!

Test: 100% | ██████████ |  
72/72 [00:05<00:00, 12.09sample/s]

```
Test Accuracy: 0.4944258639910814
Precision: 0.4893935178076262, Recall: 0.4944258639910814, F1-score: 0.3679226811234
214
Accuracy of cats : 94 %
Accuracy of dogs : 4 %
```

```
Class_name: cats
```

```
Train_count: 900
```

```
Test_count: 300
```

```
Valid_count: 300
```

```
Shutil images: 100%|██████████| 150
0/1500 [00:00<00:00, 1832.77image/s]
```

```
Class_name: dogs
```

```
Train_count: 900
```

```
Test_count: 300
```

```
Valid_count: 300
```

```
Shutil images: 100%|██████████| 150
0/1500 [00:00<00:00, 1859.93image/s]
```

---

```
Выбранная модель: mnasnet0_5
```

```
Пользовательское название модели: mnasnet0_5_Exp3
```

```
Выбранный оптимизатор: AdamW
```

---

```
Epoch 1/10 (Train): 100%|██████████| 1
18/118 [00:12<00:00, 9.08sample/s]
Epoch 1/10 (Eval): 100%|██████████| 1
71/71 [00:03<00:00, 22.00sample/s]
```

```
Epoch 1/10, Training Loss: 0.7636850132611379, Validation Loss: 0.6931246471943828
Accuracy: 0.5033898305084745, Precision: 0.25340132145935074, Recall: 0.503389830508
4745, F1-score: 0.3371066057745591
```

```
Epoch 2/10 (Train): 100%|██████████| 1
18/118 [00:12<00:00, 9.19sample/s]
Epoch 2/10 (Eval): 100%|██████████| 1
71/71 [00:03<00:00, 22.09sample/s]
```

```
Epoch 2/10, Training Loss: 0.6880694549945797, Validation Loss: 0.6931241801229574
Accuracy: 0.5033898305084745, Precision: 0.25340132145935074, Recall: 0.503389830508
4745, F1-score: 0.3371066057745591
```

```
Epoch 3/10 (Train): 100%|██████████| 1
18/118 [00:12<00:00, 9.19sample/s]
Epoch 3/10 (Eval): 100%|██████████| 1
71/71 [00:03<00:00, 22.63sample/s]
```

```
Epoch 3/10, Training Loss: 0.6850889189880512, Validation Loss: 0.6931279843809914
Accuracy: 0.5033898305084745, Precision: 0.25340132145935074, Recall: 0.503389830508
4745, F1-score: 0.3371066057745591
```

```
Epoch 4/10 (Train): 100%|██████████| 1
18/118 [00:12<00:00, 9.15sample/s]
Epoch 4/10 (Eval): 100%|██████████| 1
71/71 [00:03<00:00, 21.99sample/s]
```

Epoch 00004: reducing learning rate of group 0 to 1.0000e-04.

Epoch 4/10, Training Loss: 0.6697331219504161, Validation Loss: 0.6934376865793757  
Accuracy: 0.5033898305084745, Precision: 0.25340132145935074, Recall: 0.503389830508  
4745, F1-score: 0.3371066057745591

Epoch 5/10 (Train): 100% | ██████████ | 1  
18/118 [00:12<00:00, 9.22sample/s]  
Epoch 5/10 (Eval): 100% | ██████████ |  
71/71 [00:03<00:00, 22.41sample/s]

Epoch 5/10, Training Loss: 0.6492721141810622, Validation Loss: 0.6932736615003166  
Accuracy: 0.5033898305084745, Precision: 0.25340132145935074, Recall: 0.503389830508  
4745, F1-score: 0.3371066057745591

Epoch 6/10 (Train): 100% | ██████████ | 1  
18/118 [00:12<00:00, 9.23sample/s]  
Epoch 6/10 (Eval): 100% | ██████████ |  
71/71 [00:03<00:00, 22.28sample/s]

Epoch 6/10, Training Loss: 0.6406856125560593, Validation Loss: 0.6931685667253483  
Accuracy: 0.5033898305084745, Precision: 0.25340132145935074, Recall: 0.503389830508  
4745, F1-score: 0.3371066057745591

Epoch 7/10 (Train): 100% | ██████████ | 1  
18/118 [00:12<00:00, 9.15sample/s]  
Epoch 7/10 (Eval): 100% | ██████████ |  
71/71 [00:03<00:00, 22.57sample/s]

Epoch 00007: reducing learning rate of group 0 to 1.0000e-05.

Epoch 7/10, Training Loss: 0.6363989950163431, Validation Loss: 0.6931687667544952  
Accuracy: 0.5033898305084745, Precision: 0.25340132145935074, Recall: 0.503389830508  
4745, F1-score: 0.3371066057745591

Epoch 8/10 (Train): 100% | ██████████ | 1  
18/118 [00:12<00:00, 9.23sample/s]  
Epoch 8/10 (Eval): 100% | ██████████ |  
71/71 [00:03<00:00, 22.17sample/s]

Epoch 8/10, Training Loss: 0.6185577236273805, Validation Loss: 0.6931634164799405  
Accuracy: 0.5033898305084745, Precision: 0.25340132145935074, Recall: 0.503389830508  
4745, F1-score: 0.3371066057745591

Epoch 9/10 (Train): 100% | ██████████ | 1  
18/118 [00:12<00:00, 9.32sample/s]  
Epoch 9/10 (Eval): 100% | ██████████ |  
71/71 [00:03<00:00, 22.35sample/s]

Epoch 9/10, Training Loss: 0.609288467925425, Validation Loss: 0.6931950017220556  
Accuracy: 0.5033898305084745, Precision: 0.25340132145935074, Recall: 0.503389830508  
4745, F1-score: 0.3371066057745591

Epoch 10/10 (Train): 100% | ██████████ | 1  
18/118 [00:12<00:00, 9.18sample/s]  
Epoch 10/10 (Eval): 100% | ██████████ |  
71/71 [00:03<00:00, 22.30sample/s]

Epoch 00010: reducing learning rate of group 0 to 1.0000e-06.

Epoch 10/10, Training Loss: 0.6213861159567791, Validation Loss: 0.6932327664841367  
Accuracy: 0.5033898305084745, Precision: 0.25340132145935074, Recall: 0.503389830508  
4745, F1-score: 0.3371066057745591

Тренировка завершена!

Test: 100% | ██████████ |  
72/72 [00:03<00:00, 18.93sample/s]

```
Test Accuracy: 0.496098104793757
Precision: 0.2461133295799575, Recall: 0.496098104793757, F1-score: 0.32900693984086
715
Accuracy of cats : 100 %
Accuracy of dogs : 0 %
```

```
Class_name: cats
```

```
Train_count: 900
```

```
Test_count: 300
```

```
Valid_count: 300
```

```
Shutil images: 100%|██████████| 150
0/1500 [00:00<00:00, 1871.33image/s]
```

```
Class_name: dogs
```

```
Train_count: 900
```

```
Test_count: 300
```

```
Valid_count: 300
```

```
Shutil images: 100%|██████████| 150
0/1500 [00:00<00:00, 1871.16image/s]
```

---

```
-----
```

Выбранная модель: mnasnet0\_75

Пользовательское название модели: mnasnet0\_75\_Exp3

Выбранный оптимизатор: AdamW

```
-----
```

```
Epoch 1/10 (Train): 100%|██████████| 1
18/118 [00:12<00:00, 9.10sample/s]
Epoch 1/10 (Eval): 100%|██████████| 1
71/71 [00:03<00:00, 21.94sample/s]
```

```
Epoch 1/10, Training Loss: 0.7344195654110311, Validation Loss: 0.6931500163792217
Accuracy: 0.4966101694915254, Precision: 0.2466216604424016, Recall: 0.4966101694915
254, F1-score: 0.329573679866403
```

```
Epoch 2/10 (Train): 100%|██████████| 1
18/118 [00:13<00:00, 9.02sample/s]
Epoch 2/10 (Eval): 100%|██████████| 1
71/71 [00:03<00:00, 22.49sample/s]
```

```
Epoch 2/10, Training Loss: 0.7130252367327332, Validation Loss: 0.6931645440853248
Accuracy: 0.5033898305084745, Precision: 0.25340132145935074, Recall: 0.503389830508
4745, F1-score: 0.3371066057745591
```

```
Epoch 3/10 (Train): 100%|██████████| 1
18/118 [00:13<00:00, 9.07sample/s]
Epoch 3/10 (Eval): 100%|██████████| 1
71/71 [00:03<00:00, 22.64sample/s]
```

```
Epoch 3/10, Training Loss: 0.7037823107946596, Validation Loss: 0.6934622923533121
Accuracy: 0.5033898305084745, Precision: 0.25340132145935074, Recall: 0.503389830508
4745, F1-score: 0.3371066057745591
```

```
Epoch 4/10 (Train): 100%|██████████| 1
18/118 [00:12<00:00, 9.10sample/s]
Epoch 4/10 (Eval): 100%|██████████| 1
71/71 [00:03<00:00, 22.69sample/s]
```

Epoch 00004: reducing learning rate of group 0 to 1.0000e-04.

Epoch 4/10, Training Loss: 0.680700796133675, Validation Loss: 0.6956699384471118  
Accuracy: 0.5033898305084745, Precision: 0.25340132145935074, Recall: 0.503389830508  
4745, F1-score: 0.3371066057745591

Epoch 5/10 (Train): 100% | 1  
18/118 [00:12<00:00, 9.11sample/s]  
Epoch 5/10 (Eval): 100% |  
71/71 [00:03<00:00, 22.54sample/s]

Epoch 5/10, Training Loss: 0.617811970865979, Validation Loss: 0.6971597152914705  
Accuracy: 0.5033898305084745, Precision: 0.25340132145935074, Recall: 0.503389830508  
4745, F1-score: 0.3371066057745591

Epoch 6/10 (Train): 100% | 1  
18/118 [00:12<00:00, 9.20sample/s]  
Epoch 6/10 (Eval): 100% |  
71/71 [00:03<00:00, 22.28sample/s]

Epoch 6/10, Training Loss: 0.601558727622847, Validation Loss: 0.6999144303259877  
Accuracy: 0.5033898305084745, Precision: 0.25340132145935074, Recall: 0.503389830508  
4745, F1-score: 0.3371066057745591

Epoch 7/10 (Train): 100% | 1  
18/118 [00:12<00:00, 9.09sample/s]  
Epoch 7/10 (Eval): 100% |  
71/71 [00:03<00:00, 22.26sample/s]

Epoch 00007: reducing learning rate of group 0 to 1.0000e-05.

Epoch 7/10, Training Loss: 0.5915022523372204, Validation Loss: 0.7004243941967097  
Accuracy: 0.5033898305084745, Precision: 0.25340132145935074, Recall: 0.503389830508  
4745, F1-score: 0.3371066057745591

Epoch 8/10 (Train): 100% | 1  
18/118 [00:12<00:00, 9.21sample/s]  
Epoch 8/10 (Eval): 100% |  
71/71 [00:03<00:00, 22.86sample/s]

Epoch 8/10, Training Loss: 0.5753276320104312, Validation Loss: 0.702459658438203  
Accuracy: 0.5033898305084745, Precision: 0.25340132145935074, Recall: 0.503389830508  
4745, F1-score: 0.3371066057745591

Epoch 9/10 (Train): 100% | 1  
18/118 [00:12<00:00, 9.24sample/s]  
Epoch 9/10 (Eval): 100% |  
71/71 [00:03<00:00, 22.35sample/s]

Epoch 9/10, Training Loss: 0.5663908668784189, Validation Loss: 0.7044125975525312  
Accuracy: 0.5033898305084745, Precision: 0.25340132145935074, Recall: 0.503389830508  
4745, F1-score: 0.3371066057745591

Epoch 10/10 (Train): 100% | 1  
18/118 [00:12<00:00, 9.08sample/s]  
Epoch 10/10 (Eval): 100% |  
71/71 [00:03<00:00, 22.39sample/s]

Epoch 00010: reducing learning rate of group 0 to 1.0000e-06.

Epoch 10/10, Training Loss: 0.5708303486168262, Validation Loss: 0.7060393283596147  
Accuracy: 0.5033898305084745, Precision: 0.25340132145935074, Recall: 0.503389830508  
4745, F1-score: 0.3371066057745591

Тренировка завершена!

Test: 100% |  
72/72 [00:04<00:00, 17.79sample/s]

```
Test Accuracy: 0.496098104793757
Precision: 0.2461133295799575, Recall: 0.496098104793757, F1-score: 0.32900693984086
715
Accuracy of cats : 100 %
Accuracy of dogs : 0 %
```

```
Class_name: cats
```

```
Train_count: 900
```

```
Test_count: 300
```

```
Valid_count: 300
```

```
Shutil images: 100%|██████████| 150
0/1500 [00:00<00:00, 1736.52image/s]
```

```
Class_name: dogs
```

```
Train_count: 900
```

```
Test_count: 300
```

```
Valid_count: 300
```

```
Shutil images: 100%|██████████| 150
0/1500 [00:00<00:00, 1790.73image/s]
```

---

```
Выбранная модель: mnasnet1_0
```

```
Пользовательское название модели: mnasnet1_0_Exp3
```

```
Выбранный оптимизатор: AdamW
```

---

```
Epoch 1/10 (Train): 100%|██████████| 1
18/118 [00:12<00:00, 9.10sample/s]
Epoch 1/10 (Eval): 100%|██████████| 1
71/71 [00:03<00:00, 21.68sample/s]
```

```
Epoch 1/10, Training Loss: 0.7371840662770457, Validation Loss: 0.693126400816912
Accuracy: 0.5033898305084745, Precision: 0.25340132145935074, Recall: 0.503389830508
4745, F1-score: 0.3371066057745591
```

```
Epoch 2/10 (Train): 100%|██████████| 1
18/118 [00:13<00:00, 8.99sample/s]
Epoch 2/10 (Eval): 100%|██████████| 1
71/71 [00:03<00:00, 21.86sample/s]
```

```
Epoch 2/10, Training Loss: 0.6848557935906695, Validation Loss: 0.693484757916402
Accuracy: 0.5033898305084745, Precision: 0.25340132145935074, Recall: 0.503389830508
4745, F1-score: 0.3371066057745591
```

```
Epoch 3/10 (Train): 100%|██████████| 1
18/118 [00:13<00:00, 9.05sample/s]
Epoch 3/10 (Eval): 100%|██████████| 1
71/71 [00:03<00:00, 22.20sample/s]
```

```
Epoch 3/10, Training Loss: 0.674951211055989, Validation Loss: 0.6962474333701161
Accuracy: 0.5033898305084745, Precision: 0.25340132145935074, Recall: 0.503389830508
4745, F1-score: 0.3371066057745591
```

```
Epoch 4/10 (Train): 100%|██████████| 1
18/118 [00:12<00:00, 9.20sample/s]
Epoch 4/10 (Eval): 100%|██████████| 1
71/71 [00:03<00:00, 21.35sample/s]
```

Epoch 00004: reducing learning rate of group 0 to 1.0000e-04.

Epoch 4/10, Training Loss: 0.6419444314458154, Validation Loss: 0.6960245788434131  
Accuracy: 0.5033898305084745, Precision: 0.25340132145935074, Recall: 0.5033898305084745, F1-score: 0.3371066057745591

Epoch 5/10 (Train): 100% | ██████████ | 1  
18/118 [00:12<00:00, 9.20sample/s]  
Epoch 5/10 (Eval): 100% | ██████████ |  
71/71 [00:03<00:00, 21.82sample/s]

Epoch 5/10, Training Loss: 0.6194846429037706, Validation Loss: 0.6956943862855771  
Accuracy: 0.5033898305084745, Precision: 0.25340132145935074, Recall: 0.5033898305084745, F1-score: 0.3371066057745591

Epoch 6/10 (Train): 100% | ██████████ | 1  
18/118 [00:12<00:00, 9.08sample/s]  
Epoch 6/10 (Eval): 100% | ██████████ |  
71/71 [00:03<00:00, 21.60sample/s]

Epoch 6/10, Training Loss: 0.592426934015319, Validation Loss: 0.6964104577983167  
Accuracy: 0.5033898305084745, Precision: 0.25340132145935074, Recall: 0.5033898305084745, F1-score: 0.3371066057745591

Epoch 7/10 (Train): 100% | ██████████ | 1  
18/118 [00:12<00:00, 9.11sample/s]  
Epoch 7/10 (Eval): 100% | ██████████ |  
71/71 [00:03<00:00, 22.12sample/s]

Epoch 00007: reducing learning rate of group 0 to 1.0000e-05.

Epoch 7/10, Training Loss: 0.5602392709711522, Validation Loss: 0.6960281658980806  
Accuracy: 0.5033898305084745, Precision: 0.25340132145935074, Recall: 0.5033898305084745, F1-score: 0.3371066057745591

Epoch 8/10 (Train): 100% | ██████████ | 1  
18/118 [00:13<00:00, 8.81sample/s]  
Epoch 8/10 (Eval): 100% | ██████████ |  
71/71 [00:03<00:00, 21.57sample/s]

Epoch 8/10, Training Loss: 0.5422665812813575, Validation Loss: 0.6957682622017833  
Accuracy: 0.5033898305084745, Precision: 0.25340132145935074, Recall: 0.5033898305084745, F1-score: 0.3371066057745591

Epoch 9/10 (Train): 100% | ██████████ | 1  
18/118 [00:12<00:00, 9.24sample/s]  
Epoch 9/10 (Eval): 100% | ██████████ |  
71/71 [00:03<00:00, 22.20sample/s]

Epoch 9/10, Training Loss: 0.526100354443571, Validation Loss: 0.6957246782416004  
Accuracy: 0.5033898305084745, Precision: 0.25340132145935074, Recall: 0.5033898305084745, F1-score: 0.3371066057745591

Epoch 10/10 (Train): 100% | ██████████ | 1  
18/118 [00:12<00:00, 9.11sample/s]  
Epoch 10/10 (Eval): 100% | ██████████ |  
71/71 [00:03<00:00, 21.63sample/s]

Epoch 00010: reducing learning rate of group 0 to 1.0000e-06.

Epoch 10/10, Training Loss: 0.5341475886978356, Validation Loss: 0.6956725248509208  
Accuracy: 0.5033898305084745, Precision: 0.25340132145935074, Recall: 0.5033898305084745, F1-score: 0.3371066057745591

Тренировка завершена!

Test: 100% | ██████████ |  
72/72 [00:04<00:00, 16.96sample/s]

```
Test Accuracy: 0.496098104793757
Precision: 0.2461133295799575, Recall: 0.496098104793757, F1-score: 0.32900693984086
715
Accuracy of cats : 100 %
Accuracy of dogs : 0 %
```

```
Class_name: cats
```

```
Train_count: 900
```

```
Test_count: 300
```

```
Valid_count: 300
```

```
Shutil images: 100%|██████████| 150
0/1500 [00:00<00:00, 1849.25image/s]
```

```
Class_name: dogs
```

```
Train_count: 900
```

```
Test_count: 300
```

```
Valid_count: 300
```

```
Shutil images: 100%|██████████| 150
0/1500 [00:00<00:00, 1841.73image/s]
```

---

```
Выбранная модель: mnasnet1_3
```

```
Пользовательское название модели: mnasnet1_3_Exp3
```

```
Выбранный оптимизатор: AdamW
```

---

```
Epoch 1/10 (Train): 100%|██████████| 1
18/118 [00:13<00:00, 8.96sample/s]
Epoch 1/10 (Eval): 100%|██████████| 1
71/71 [00:03<00:00, 21.24sample/s]
```

```
Epoch 1/10, Training Loss: 0.7266751962496822, Validation Loss: 0.6931420168970938
Accuracy: 0.5033898305084745, Precision: 0.25340132145935074, Recall: 0.503389830508
4745, F1-score: 0.3371066057745591
```

```
Epoch 2/10 (Train): 100%|██████████| 1
18/118 [00:12<00:00, 9.24sample/s]
Epoch 2/10 (Eval): 100%|██████████| 1
71/71 [00:03<00:00, 20.42sample/s]
```

```
Epoch 2/10, Training Loss: 0.6835700941366931, Validation Loss: 0.6934248219102116
Accuracy: 0.4966101694915254, Precision: 0.2466216604424016, Recall: 0.4966101694915
254, F1-score: 0.329573679866403
```

```
Epoch 3/10 (Train): 100%|██████████| 1
18/118 [00:12<00:00, 9.13sample/s]
Epoch 3/10 (Eval): 100%|██████████| 1
71/71 [00:03<00:00, 20.58sample/s]
```

```
Epoch 3/10, Training Loss: 0.6503402646567344, Validation Loss: 0.6937848460876336
Accuracy: 0.4966101694915254, Precision: 0.2466216604424016, Recall: 0.4966101694915
254, F1-score: 0.329573679866403
```

```
Epoch 4/10 (Train): 100%|██████████| 1
18/118 [00:12<00:00, 9.08sample/s]
Epoch 4/10 (Eval): 100%|██████████| 1
71/71 [00:03<00:00, 20.52sample/s]
```

Epoch 00004: reducing learning rate of group 0 to 1.0000e-04.

Epoch 4/10, Training Loss: 0.6340497219635866, Validation Loss: 0.6940135238534313  
Accuracy: 0.5033898305084745, Precision: 0.25340132145935074, Recall: 0.5033898305084745, F1-score: 0.3371066057745591

Epoch 5/10 (Train): 100% | ██████████ | 1  
18/118 [00:12<00:00, 9.14sample/s]  
Epoch 5/10 (Eval): 100% | ██████████ |  
71/71 [00:03<00:00, 21.08sample/s]

Epoch 5/10, Training Loss: 0.5700780131070482, Validation Loss: 0.6933485075915601  
Accuracy: 0.5033898305084745, Precision: 0.25340132145935074, Recall: 0.5033898305084745, F1-score: 0.3371066057745591

Epoch 6/10 (Train): 100% | ██████████ | 1  
18/118 [00:12<00:00, 9.17sample/s]  
Epoch 6/10 (Eval): 100% | ██████████ |  
71/71 [00:03<00:00, 21.24sample/s]

Epoch 6/10, Training Loss: 0.5437499511368211, Validation Loss: 0.6944254909531545  
Accuracy: 0.5033898305084745, Precision: 0.25340132145935074, Recall: 0.5033898305084745, F1-score: 0.3371066057745591

Epoch 7/10 (Train): 100% | ██████████ | 1  
18/118 [00:13<00:00, 8.98sample/s]  
Epoch 7/10 (Eval): 100% | ██████████ |  
71/71 [00:03<00:00, 20.61sample/s]

Epoch 00007: reducing learning rate of group 0 to 1.0000e-05.

Epoch 7/10, Training Loss: 0.5175093691375919, Validation Loss: 0.6940456776969177  
Accuracy: 0.5033898305084745, Precision: 0.25340132145935074, Recall: 0.5033898305084745, F1-score: 0.3371066057745591

Epoch 8/10 (Train): 100% | ██████████ | 1  
18/118 [00:13<00:00, 8.98sample/s]  
Epoch 8/10 (Eval): 100% | ██████████ |  
71/71 [00:03<00:00, 21.12sample/s]

Epoch 8/10, Training Loss: 0.4859808297981893, Validation Loss: 0.694452359683096  
Accuracy: 0.5033898305084745, Precision: 0.25340132145935074, Recall: 0.5033898305084745, F1-score: 0.3371066057745591

Epoch 9/10 (Train): 100% | ██████████ | 1  
18/118 [00:12<00:00, 9.11sample/s]  
Epoch 9/10 (Eval): 100% | ██████████ |  
71/71 [00:03<00:00, 20.82sample/s]

Epoch 9/10, Training Loss: 0.4665236627697048, Validation Loss: 0.6949096210932327  
Accuracy: 0.5033898305084745, Precision: 0.25340132145935074, Recall: 0.5033898305084745, F1-score: 0.3371066057745591

Epoch 10/10 (Train): 100% | ██████████ | 1  
18/118 [00:12<00:00, 9.15sample/s]  
Epoch 10/10 (Eval): 100% | ██████████ |  
71/71 [00:03<00:00, 21.43sample/s]

Epoch 00010: reducing learning rate of group 0 to 1.0000e-06.

Epoch 10/10, Training Loss: 0.4944485465824726, Validation Loss: 0.6949030076716579  
Accuracy: 0.5033898305084745, Precision: 0.25340132145935074, Recall: 0.5033898305084745, F1-score: 0.3371066057745591

Тренировка завершена!

Test: 100% | ██████████ |  
72/72 [00:04<00:00, 17.55sample/s]

```
Test Accuracy: 0.496098104793757
Precision: 0.2461133295799575, Recall: 0.496098104793757, F1-score: 0.32900693984086
715
Accuracy of cats : 100 %
Accuracy of dogs : 0 %
```

```
Class_name: cats
```

```
Train_count: 900
```

```
Test_count: 300
```

```
Valid_count: 300
```

```
Shutil images: 100%|██████████| 150
0/1500 [00:00<00:00, 1852.45image/s]
```

```
Class_name: dogs
```

```
Train_count: 900
```

```
Test_count: 300
```

```
Valid_count: 300
```

```
Shutil images: 100%|██████████| 150
0/1500 [00:00<00:00, 1849.17image/s]
```

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```
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```

Выбранная модель: mobilenet\_v2

Пользовательское название модели: mobilenet\_v2\_Exp3

Выбранный оптимизатор: AdamW

```
-----
```

```
Epoch 1/10 (Train): 100%|██████████| 1
18/118 [00:13<00:00, 8.94sample/s]
Epoch 1/10 (Eval): 100%|██████████| 1
71/71 [00:03<00:00, 21.69sample/s]
```

```
Epoch 1/10, Training Loss: 0.7438180291196376, Validation Loss: 0.6823238674866952
Accuracy: 0.5745762711864407, Precision: 0.5781909905529313, Recall: 0.5745762711864
407, F1-score: 0.568324694121771
```

```
Epoch 2/10 (Train): 100%|██████████| 1
18/118 [00:12<00:00, 9.09sample/s]
Epoch 2/10 (Eval): 100%|██████████| 1
71/71 [00:03<00:00, 21.23sample/s]
```

```
Epoch 2/10, Training Loss: 0.6818749297585947, Validation Loss: 0.689194147869692
Accuracy: 0.536723163841808, Precision: 0.5374032392683552, Recall: 0.53672316384180
8, F1-score: 0.5325141950922504
```

```
Epoch 3/10 (Train): 100%|██████████| 1
18/118 [00:12<00:00, 9.09sample/s]
Epoch 3/10 (Eval): 100%|██████████| 1
71/71 [00:03<00:00, 21.66sample/s]
```

```
Epoch 3/10, Training Loss: 0.678183871695055, Validation Loss: 0.6360829263757177
Accuracy: 0.6531073446327683, Precision: 0.6661243744235625, Recall: 0.6531073446327
683, F1-score: 0.6468384987893462
```

```
Epoch 4/10 (Train): 100%|██████████| 1
18/118 [00:13<00:00, 9.03sample/s]
Epoch 4/10 (Eval): 100%|██████████| 1
71/71 [00:03<00:00, 21.07sample/s]
```

Epoch 4/10, Training Loss: 0.6552016642084695, Validation Loss: 0.6107054156603786  
Accuracy: 0.6638418079096046, Precision: 0.6787794484668971, Recall: 0.6638418079096  
046, F1-score: 0.6560100963020143

Epoch 5/10 (Train): 100% | ██████████ | 1  
18/118 [00:12<00:00, 9.14sample/s]

Epoch 5/10 (Eval): 100% | ██████████ |  
71/71 [00:03<00:00, 21.01sample/s]

Epoch 5/10, Training Loss: 0.654818589627865, Validation Loss: 0.6495419946094018  
Accuracy: 0.6242937853107344, Precision: 0.6437941212991063, Recall: 0.6242937853107  
344, F1-score: 0.6099723524462075

Epoch 6/10 (Train): 100% | ██████████ | 1  
18/118 [00:12<00:00, 9.23sample/s]

Epoch 6/10 (Eval): 100% | ██████████ |  
71/71 [00:03<00:00, 21.28sample/s]

Epoch 6/10, Training Loss: 0.6437654951542758, Validation Loss: 0.6016057047803524  
Accuracy: 0.6909604519774011, Precision: 0.7015297734820518, Recall: 0.6909604519774  
011, F1-score: 0.6864191337112997

Epoch 7/10 (Train): 100% | ██████████ | 1  
18/118 [00:12<00:00, 9.24sample/s]

Epoch 7/10 (Eval): 100% | ██████████ |  
71/71 [00:03<00:00, 21.48sample/s]

Epoch 7/10, Training Loss: 0.6333524343479356, Validation Loss: 0.5814592043558756  
Accuracy: 0.6966101694915254, Precision: 0.7064100084277958, Recall: 0.6966101694915  
254, F1-score: 0.6925666007152343

Epoch 8/10 (Train): 100% | ██████████ | 1  
18/118 [00:13<00:00, 9.03sample/s]

Epoch 8/10 (Eval): 100% | ██████████ |  
71/71 [00:03<00:00, 20.71sample/s]

Epoch 8/10, Training Loss: 0.6106479131882108, Validation Loss: 0.5412526968340415  
Accuracy: 0.7231638418079096, Precision: 0.7249821460361152, Recall: 0.7231638418079  
096, F1-score: 0.7227334757404136

Epoch 9/10 (Train): 100% | ██████████ | 1  
18/118 [00:13<00:00, 9.07sample/s]

Epoch 9/10 (Eval): 100% | ██████████ |  
71/71 [00:03<00:00, 21.62sample/s]

Epoch 9/10, Training Loss: 0.5938294598564088, Validation Loss: 0.5422724010580677  
Accuracy: 0.731638418079096, Precision: 0.7317477030655718, Recall: 0.7316384180790  
96, F1-score: 0.7315694354824196

Epoch 10/10 (Train): 100% | ██████████ | 1  
18/118 [00:12<00:00, 9.15sample/s]

Epoch 10/10 (Eval): 100% | ██████████ |  
71/71 [00:03<00:00, 22.10sample/s]

Epoch 10/10, Training Loss: 0.5873166880661383, Validation Loss: 0.5742704406969965  
Accuracy: 0.7016949152542373, Precision: 0.7056130084730918, Recall: 0.7016949152542  
373, F1-score: 0.7004996552903205

Тренировка завершена!

Test: 100% | ██████████ |  
72/72 [00:03<00:00, 18.77sample/s]

```
Test Accuracy: 0.6978818283166109
Precision: 0.7010577570650648, Recall: 0.6978818283166109, F1-score: 0.6964117330335
753
Accuracy of cats : 62 %
Accuracy of dogs : 76 %
```

```
Class_name: cats
```

```
Train_count: 900
```

```
Test_count: 300
```

```
Valid_count: 300
```

```
Shutil images: 100%|██████████| 150
0/1500 [00:00<00:00, 1848.72image/s]
```

```
Class_name: dogs
```

```
Train_count: 900
```

```
Test_count: 300
```

```
Valid_count: 300
```

```
Shutil images: 100%|██████████| 150
0/1500 [00:00<00:00, 1812.79image/s]
```

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```
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```

Выбранная модель: mobilenet\_v3\_large

Пользовательское название модели: mobilenet\_v3\_large\_Exp3

Выбранный оптимизатор: AdamW

```
-----
```

```
Epoch 1/10 (Train): 100%|██████████| 1
18/118 [00:14<00:00, 8.10sample/s]
```

```
Epoch 1/10 (Eval): 100%|██████████| 1
71/71 [00:03<00:00, 21.08sample/s]
```

```
Epoch 1/10, Training Loss: 0.7067476261868024, Validation Loss: 0.6945030736384419
Accuracy: 0.5033898305084745, Precision: 0.25340132145935074, Recall: 0.503389830508
4745, F1-score: 0.3371066057745591
```

```
Epoch 2/10 (Train): 100%|██████████| 1
18/118 [00:14<00:00, 8.12sample/s]
```

```
Epoch 2/10 (Eval): 100%|██████████| 1
71/71 [00:03<00:00, 20.80sample/s]
```

```
Epoch 2/10, Training Loss: 0.6825161505788463, Validation Loss: 0.6931745441956708
Accuracy: 0.5033898305084745, Precision: 0.25340132145935074, Recall: 0.503389830508
4745, F1-score: 0.3371066057745591
```

```
Epoch 3/10 (Train): 100%|██████████| 1
18/118 [00:14<00:00, 8.11sample/s]
```

```
Epoch 3/10 (Eval): 100%|██████████| 1
71/71 [00:03<00:00, 21.03sample/s]
```

```
Epoch 3/10, Training Loss: 0.6654654881845006, Validation Loss: 0.6932853608481628
Accuracy: 0.5033898305084745, Precision: 0.25340132145935074, Recall: 0.503389830508
4745, F1-score: 0.3371066057745591
```

```
Epoch 4/10 (Train): 100%|██████████| 1
18/118 [00:14<00:00, 7.88sample/s]
```

```
Epoch 4/10 (Eval): 100%|██████████| 1
71/71 [00:03<00:00, 20.52sample/s]
```

```
Epoch 4/10, Training Loss: 0.6411127284607167, Validation Loss: 0.6916799009856531
Accuracy: 0.5033898305084745, Precision: 0.25340132145935074, Recall: 0.503389830508
4745, F1-score: 0.3371066057745591
Epoch 5/10 (Train): 100%|██████████| 1
18/118 [00:14<00:00, 8.13sample/s]
Epoch 5/10 (Eval): 100%|██████████| 1
71/71 [00:03<00:00, 20.83sample/s]
Epoch 5/10, Training Loss: 0.6842296282803451, Validation Loss: 0.7097434586724319
Accuracy: 0.5, Precision: 0.4988697551559484, Recall: 0.5, F1-score: 0.4878082550942
5507
Epoch 6/10 (Train): 100%|██████████| 1
18/118 [00:14<00:00, 8.05sample/s]
Epoch 6/10 (Eval): 100%|██████████| 1
71/71 [00:03<00:00, 20.88sample/s]
Epoch 6/10, Training Loss: 0.682906394145787, Validation Loss: 0.765380528266147
Accuracy: 0.5203389830508475, Precision: 0.5409817559758067, Recall: 0.5203389830508
475, F1-score: 0.44071922508597344
Epoch 7/10 (Train): 100%|██████████| 1
18/118 [00:14<00:00, 8.16sample/s]
Epoch 7/10 (Eval): 100%|██████████| 1
71/71 [00:03<00:00, 20.12sample/s]
Epoch 00007: reducing learning rate of group 0 to 1.0000e-04.

Epoch 7/10, Training Loss: 0.685549633782446, Validation Loss: 0.7475612672035303
Accuracy: 0.5531073446327683, Precision: 0.6053399975478468, Recall: 0.5531073446327
683, F1-score: 0.4859494636862359
Epoch 8/10 (Train): 100%|██████████| 1
18/118 [00:14<00:00, 8.05sample/s]
Epoch 8/10 (Eval): 100%|██████████| 1
71/71 [00:03<00:00, 20.74sample/s]
Epoch 8/10, Training Loss: 0.640003777434381, Validation Loss: 0.6355474559263995
Accuracy: 0.6474576271186441, Precision: 0.6488193765619784, Recall: 0.6474576271186
441, F1-score: 0.6463772188324709
Epoch 9/10 (Train): 100%|██████████| 1
18/118 [00:14<00:00, 7.99sample/s]
Epoch 9/10 (Eval): 100%|██████████| 1
71/71 [00:03<00:00, 20.87sample/s]
Epoch 9/10, Training Loss: 0.6234994003687994, Validation Loss: 0.6208847674441202
Accuracy: 0.6661016949152543, Precision: 0.6662978460596587, Recall: 0.6661016949152
543, F1-score: 0.6659083207512253
Epoch 10/10 (Train): 100%|██████████| 1
18/118 [00:14<00:00, 8.07sample/s]
Epoch 10/10 (Eval): 100%|██████████| 1
71/71 [00:03<00:00, 20.61sample/s]
Epoch 10/10, Training Loss: 0.6122946925996023, Validation Loss: 0.6132384507501193
Accuracy: 0.6632768361581921, Precision: 0.6648282349643063, Recall: 0.6632768361581
921, F1-score: 0.6626912823223734
Тренировка завершена!
Test: 100%|██████████| 1
72/72 [00:04<00:00, 16.96sample/s]
```

```
Test Accuracy: 0.6711259754738016
Precision: 0.6717232939027931, Recall: 0.6711259754738016, F1-score: 0.6706715033767
645
Accuracy of cats : 63 %
Accuracy of dogs : 70 %
```

```
Class_name: cats
```

```
Train_count: 900
```

```
Test_count: 300
```

```
Valid_count: 300
```

```
Shutil images: 100%|██████████| 150
0/1500 [00:00<00:00, 1802.00image/s]
```

```
Class_name: dogs
```

```
Train_count: 900
```

```
Test_count: 300
```

```
Valid_count: 300
```

```
Shutil images: 100%|██████████| 150
0/1500 [00:00<00:00, 1795.52image/s]
```

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```
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```

Выбранная модель: mobilenet\_v3\_small

Пользовательское название модели: mobilenet\_v3\_small\_Exp3

Выбранный оптимизатор: AdamW

```
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```

```
Epoch 1/10 (Train): 100%|██████████| 1
18/118 [00:12<00:00, 9.28sample/s]
Epoch 1/10 (Eval): 100%|██████████| 1
71/71 [00:03<00:00, 20.96sample/s]
```

```
Epoch 1/10, Training Loss: 0.6996575971620994, Validation Loss: 0.6931633045107631
Accuracy: 0.5033898305084745, Precision: 0.25340132145935074, Recall: 0.503389830508
4745, F1-score: 0.3371066057745591
```

```
Epoch 2/10 (Train): 100%|██████████| 1
18/118 [00:12<00:00, 9.27sample/s]
Epoch 2/10 (Eval): 100%|██████████| 1
71/71 [00:03<00:00, 21.23sample/s]
```

```
Epoch 2/10, Training Loss: 0.6640090061757797, Validation Loss: 0.6934584901157745
Accuracy: 0.4966101694915254, Precision: 0.2466216604424016, Recall: 0.4966101694915
254, F1-score: 0.329573679866403
```

```
Epoch 3/10 (Train): 100%|██████████| 1
18/118 [00:12<00:00, 9.38sample/s]
Epoch 3/10 (Eval): 100%|██████████| 1
71/71 [00:03<00:00, 21.19sample/s]
```

```
Epoch 3/10, Training Loss: 0.6399706636930441, Validation Loss: 0.692787175629772
Accuracy: 0.56045197740113, Precision: 0.6697133860384296, Recall: 0.56045197740113,
F1-score: 0.47301480927832473
```

```
Epoch 4/10 (Train): 100%|██████████| 1
18/118 [00:12<00:00, 9.26sample/s]
Epoch 4/10 (Eval): 100%|██████████| 1
71/71 [00:03<00:00, 20.98sample/s]
```

```
Epoch 4/10, Training Loss: 0.6217155390032659, Validation Loss: 0.682410335810171
Accuracy: 0.5734463276836158, Precision: 0.6907306287189309, Recall: 0.5734463276836
158, F1-score: 0.49330421483688913
```

```
Epoch 5/10 (Train): 100%|██████████| 1
18/118 [00:12<00:00, 9.32sample/s]
Epoch 5/10 (Eval): 100%|██████████| 1
71/71 [00:03<00:00, 22.12sample/s]
```

```
Epoch 5/10, Training Loss: 0.6115237640360814, Validation Loss: 0.6419814972385849
Accuracy: 0.6847457627118644, Precision: 0.6952676117125829, Recall: 0.6847457627118
644, F1-score: 0.6799795555893262
```

```
Epoch 6/10 (Train): 100%|██████████| 1
18/118 [00:11<00:00, 9.96sample/s]
Epoch 6/10 (Eval): 100%|██████████| 1
71/71 [00:03<00:00, 22.33sample/s]
```

```
Epoch 6/10, Training Loss: 0.5778575124637932, Validation Loss: 0.5499180539348031
Accuracy: 0.727683615819209, Precision: 0.7324976829615457, Recall: 0.72768361581920
9, F1-score: 0.7264715970804809
```

```
Epoch 7/10 (Train): 100%|██████████| 1
18/118 [00:11<00:00, 10.17sample/s]
Epoch 7/10 (Eval): 100%|██████████| 1
71/71 [00:03<00:00, 22.43sample/s]
```

```
Epoch 7/10, Training Loss: 0.5743528298539653, Validation Loss: 0.5996577627746399
Accuracy: 0.7, Precision: 0.7186682639512829, Recall: 0.7, F1-score: 0.6939523743994
098
```

```
Epoch 8/10 (Train): 100%|██████████| 1
18/118 [00:11<00:00, 10.12sample/s]
Epoch 8/10 (Eval): 100%|██████████| 1
71/71 [00:03<00:00, 21.68sample/s]
```

```
Epoch 8/10, Training Loss: 0.5800381537707636, Validation Loss: 0.7819048793891729
Accuracy: 0.6627118644067796, Precision: 0.6731666729133438, Recall: 0.6627118644067
796, F1-score: 0.6569687028495123
```

```
Epoch 9/10 (Train): 100%|██████████| 1
18/118 [00:11<00:00, 10.03sample/s]
Epoch 9/10 (Eval): 100%|██████████| 1
71/71 [00:03<00:00, 21.45sample/s]
```

```
Epoch 00009: reducing learning rate of group 0 to 1.0000e-04.
```

```
Epoch 9/10, Training Loss: 0.5844218136917135, Validation Loss: 0.6805282314281679
Accuracy: 0.6440677966101694, Precision: 0.65080577031729, Recall: 0.644067796610169
4, F1-score: 0.6394650979292364
```

```
Epoch 10/10 (Train): 100%|██████████| 1
18/118 [00:11<00:00, 10.00sample/s]
Epoch 10/10 (Eval): 100%|██████████| 1
71/71 [00:03<00:00, 22.58sample/s]
```

```
Epoch 10/10, Training Loss: 0.5746840789190971, Validation Loss: 0.5777701116719488
Accuracy: 0.6977401129943502, Precision: 0.6979112543677035, Recall: 0.6977401129943
502, F1-score: 0.6976114301880407
```

```
Тренировка завершена!
```

```
Test: 100%|██████████| 1
72/72 [00:03<00:00, 19.32sample/s]
```

```
Test Accuracy: 0.6911928651059086
Precision: 0.6913942857953894, Recall: 0.6911928651059086, F1-score: 0.6911698365245
627
Accuracy of cats : 70 %
Accuracy of dogs : 68 %
```

```
Class_name: cats
```

```
Train_count: 900
```

```
Test_count: 300
```

```
Valid_count: 300
```

```
Shutil images: 100%|██████████| 150
0/1500 [00:00<00:00, 1836.85image/s]
```

```
Class_name: dogs
```

```
Train_count: 900
```

```
Test_count: 300
```

```
Valid_count: 300
```

```
Shutil images: 100%|██████████| 150
0/1500 [00:00<00:00, 1831.16image/s]
```

---

```
-----
```

Выбранная модель: regnet\_x\_16gf

Пользовательское название модели: regnet\_x\_16gf\_Exp3

Выбранный оптимизатор: SGD

```
-----
```

```
Epoch 1/10 (Train): 100%|██████████| 1
18/118 [00:15<00:00, 7.58sample/s]
Epoch 1/10 (Eval): 100%|██████████| 1
71/71 [00:04<00:00, 16.55sample/s]
```

```
Epoch 1/10, Training Loss: 0.7036085782887099, Validation Loss: 12.20993006508777
Accuracy: 0.5033898305084745, Precision: 0.25340132145935074, Recall: 0.503389830508
4745, F1-score: 0.3371066057745591
```

```
Epoch 2/10 (Train): 100%|██████████| 1
18/118 [00:15<00:00, 7.67sample/s]
Epoch 2/10 (Eval): 100%|██████████| 1
71/71 [00:04<00:00, 16.40sample/s]
```

```
Epoch 2/10, Training Loss: 0.7077775777649243, Validation Loss: 3.013585940308574
Accuracy: 0.5056497175141242, Precision: 0.6016101694915253, Recall: 0.5056497175141
242, F1-score: 0.34505953827998803
```

```
Epoch 3/10 (Train): 100%|██████████| 1
18/118 [00:15<00:00, 7.67sample/s]
Epoch 3/10 (Eval): 100%|██████████| 1
71/71 [00:04<00:00, 16.43sample/s]
```

```
Epoch 3/10, Training Loss: 0.7047114557015595, Validation Loss: 1.5063452810722555
Accuracy: 0.5124293785310734, Precision: 0.51264493698392, Recall: 0.512429378531073
4, F1-score: 0.4994429851038162
```

```
Epoch 4/10 (Train): 100%|██████████| 1
18/118 [00:15<00:00, 7.63sample/s]
Epoch 4/10 (Eval): 100%|██████████| 1
71/71 [00:04<00:00, 16.40sample/s]
```

Epoch 4/10, Training Loss: 0.7068735872811026, Validation Loss: 2.1074949495578554  
Accuracy: 0.5033898305084745, Precision: 0.5017278827134158, Recall: 0.5033898305084  
745, F1-score: 0.3478462736437673

Epoch 5/10 (Train): 100% | ██████████ | 1  
18/118 [00:15<00:00, 7.61sample/s]  
Epoch 5/10 (Eval): 100% | ██████████ |  
71/71 [00:04<00:00, 16.38sample/s]

Epoch 5/10, Training Loss: 0.7012382448330695, Validation Loss: 1.1041222056005635  
Accuracy: 0.5096045197740113, Precision: 0.6044826062387835, Recall: 0.5096045197740  
113, F1-score: 0.358333467568351

Epoch 6/10 (Train): 100% | ██████████ | 1  
18/118 [00:15<00:00, 7.61sample/s]  
Epoch 6/10 (Eval): 100% | ██████████ |  
71/71 [00:04<00:00, 16.38sample/s]

Epoch 6/10, Training Loss: 0.6988090932450715, Validation Loss: 0.9727718959757163  
Accuracy: 0.49265536723163844, Precision: 0.4830371232806141, Recall: 0.492655367231  
63844, F1-score: 0.3783885509201086

Epoch 7/10 (Train): 100% | ██████████ | 1  
18/118 [00:15<00:00, 7.54sample/s]  
Epoch 7/10 (Eval): 100% | ██████████ |  
71/71 [00:04<00:00, 16.35sample/s]

Epoch 7/10, Training Loss: 0.6981753385686255, Validation Loss: 0.7986609606587954  
Accuracy: 0.5129943502824859, Precision: 0.5671417575771784, Recall: 0.5129943502824  
859, F1-score: 0.39900627932583416

Epoch 8/10 (Train): 100% | ██████████ | 1  
18/118 [00:15<00:00, 7.58sample/s]  
Epoch 8/10 (Eval): 100% | ██████████ |  
71/71 [00:04<00:00, 16.29sample/s]

Epoch 8/10, Training Loss: 0.6920104721027617, Validation Loss: 0.7420682728627307  
Accuracy: 0.507909604519774, Precision: 0.5236991981046109, Recall: 0.50790960451977  
4, F1-score: 0.38542491822777286

Epoch 9/10 (Train): 100% | ██████████ | 1  
18/118 [00:15<00:00, 7.55sample/s]  
Epoch 9/10 (Eval): 100% | ██████████ |  
71/71 [00:04<00:00, 16.31sample/s]

Epoch 9/10, Training Loss: 0.6910615071440428, Validation Loss: 0.7575320509699105  
Accuracy: 0.5169491525423728, Precision: 0.6196889419031504, Recall: 0.5169491525423  
728, F1-score: 0.390682096068853

Epoch 10/10 (Train): 100% | ██████████ | 1  
18/118 [00:15<00:00, 7.51sample/s]  
Epoch 10/10 (Eval): 100% | ██████████ |  
71/71 [00:04<00:00, 16.24sample/s]

Epoch 10/10, Training Loss: 0.693879063701434, Validation Loss: 0.8137713624427547  
Accuracy: 0.5073446327683616, Precision: 0.5588188633010241, Recall: 0.5073446327683  
616, F1-score: 0.35722400175064994

Тренировка завершена!

Test: 100% | ██████████ |  
72/72 [00:04<00:00, 15.58sample/s]

```
Test Accuracy: 0.5016722408026756
Precision: 0.5694219851364828, Recall: 0.5016722408026756, F1-score: 0.3532678188721
463
Accuracy of cats : 98 %
Accuracy of dogs : 2 %
```

```
Class_name: cats
```

```
Train_count: 900
```

```
Test_count: 300
```

```
Valid_count: 300
```

```
Shutil images: 100%|██████████| 150
0/1500 [00:00<00:00, 1828.12image/s]
```

```
Class_name: dogs
```

```
Train_count: 900
```

```
Test_count: 300
```

```
Valid_count: 300
```

```
Shutil images: 100%|██████████| 150
0/1500 [00:00<00:00, 1832.15image/s]
```

---

```
-----
```

Выбранная модель: regnet\_x\_1\_6gf

Пользовательское название модели: regnet\_x\_1\_6gf\_Exp3

Выбранный оптимизатор: SGD

```
-----
```

```
Epoch 1/10 (Train): 100%|██████████| 1
18/118 [00:12<00:00, 9.81sample/s]
Epoch 1/10 (Eval): 100%|██████████| 1
71/71 [00:03<00:00, 19.52sample/s]
```

```
Epoch 1/10, Training Loss: 0.7080405716283307, Validation Loss: 65.98734498540246
Accuracy: 0.4966101694915254, Precision: 0.2466216604424016, Recall: 0.4966101694915
254, F1-score: 0.329573679866403
```

```
Epoch 2/10 (Train): 100%|██████████| 1
18/118 [00:11<00:00, 9.99sample/s]
Epoch 2/10 (Eval): 100%|██████████| 1
71/71 [00:03<00:00, 19.53sample/s]
```

```
Epoch 2/10, Training Loss: 0.7043667002361439, Validation Loss: 0.9494624940183877
Accuracy: 0.496045197740113, Precision: 0.48697387951235643, Recall: 0.4960451977401
13, F1-score: 0.4216687007973253
```

```
Epoch 3/10 (Train): 100%|██████████| 1
18/118 [00:11<00:00, 9.83sample/s]
Epoch 3/10 (Eval): 100%|██████████| 1
71/71 [00:03<00:00, 19.31sample/s]
```

```
Epoch 3/10, Training Loss: 0.7084168848197752, Validation Loss: 10.850013694427329
Accuracy: 0.4966101694915254, Precision: 0.4983127627310594, Recall: 0.4966101694915
254, F1-score: 0.3315708596507212
```

```
Epoch 4/10 (Train): 100%|██████████| 1
18/118 [00:11<00:00, 9.98sample/s]
Epoch 4/10 (Eval): 100%|██████████| 1
71/71 [00:03<00:00, 19.36sample/s]
```

Epoch 4/10, Training Loss: 0.7093120570347395, Validation Loss: 4.035850488712306  
Accuracy: 0.5022598870056497, Precision: 0.6141226777333902, Recall: 0.5022598870056497, F1-score: 0.347708683928905

Epoch 5/10 (Train): 100% | ██████████ | 1  
18/118 [00:11<00:00, 9.94sample/s]  
Epoch 5/10 (Eval): 100% | ██████████ |  
71/71 [00:03<00:00, 19.61sample/s]

Epoch 00005: reducing learning rate of group 0 to 1.0000e-04.

Epoch 5/10, Training Loss: 0.7044237144826132, Validation Loss: 1.2971360278079065  
Accuracy: 0.5050847457627119, Precision: 0.5212814562578097, Recall: 0.5050847457627119, F1-score: 0.357929973111431

Epoch 6/10 (Train): 100% | ██████████ | 1  
18/118 [00:12<00:00, 9.71sample/s]  
Epoch 6/10 (Eval): 100% | ██████████ |  
71/71 [00:03<00:00, 19.53sample/s]

Epoch 6/10, Training Loss: 0.7119794080131933, Validation Loss: 0.7124936011551464  
Accuracy: 0.49491525423728816, Precision: 0.4952873926447486, Recall: 0.49491525423728816, F1-score: 0.4928914617983838

Epoch 7/10 (Train): 100% | ██████████ | 1  
18/118 [00:11<00:00, 9.86sample/s]  
Epoch 7/10 (Eval): 100% | ██████████ |  
71/71 [00:03<00:00, 19.08sample/s]

Epoch 7/10, Training Loss: 0.6983193829910281, Validation Loss: 0.698221819043833  
Accuracy: 0.5056497175141242, Precision: 0.505862167721107, Recall: 0.5056497175141242, F1-score: 0.5053357144145747

Epoch 8/10 (Train): 100% | ██████████ | 1  
18/118 [00:11<00:00, 9.98sample/s]  
Epoch 8/10 (Eval): 100% | ██████████ |  
71/71 [00:03<00:00, 19.60sample/s]

Epoch 8/10, Training Loss: 0.7014025406363233, Validation Loss: 0.6981093930659321  
Accuracy: 0.5333333333333333, Precision: 0.534308499263182, Recall: 0.5333333333333333, F1-score: 0.5315954928365

Epoch 9/10 (Train): 100% | ██████████ | 1  
18/118 [00:11<00:00, 9.98sample/s]  
Epoch 9/10 (Eval): 100% | ██████████ |  
71/71 [00:03<00:00, 19.88sample/s]

Epoch 9/10, Training Loss: 0.6950183734450532, Validation Loss: 0.7087907368517191  
Accuracy: 0.5169491525423728, Precision: 0.5169761162769722, Recall: 0.5169491525423728, F1-score: 0.5169545491125076

Epoch 10/10 (Train): 100% | ██████████ | 1  
18/118 [00:11<00:00, 9.88sample/s]  
Epoch 10/10 (Eval): 100% | ██████████ |  
71/71 [00:03<00:00, 18.51sample/s]

Epoch 10/10, Training Loss: 0.699141113890904, Validation Loss: 0.7207900071884953  
Accuracy: 0.5022598870056497, Precision: 0.5033538338706872, Recall: 0.5022598870056497, F1-score: 0.4942444254511254

Тренировка завершена!

Test: 100% | ██████████ |  
72/72 [00:04<00:00, 17.10sample/s]

```
Test Accuracy: 0.512263099219621
Precision: 0.5119897919630283, Recall: 0.512263099219621, F1-score: 0.50649457656658
78
Accuracy of cats : 40 %
Accuracy of dogs : 61 %
```

```
Class_name: cats
```

```
Train_count: 900
```

```
Test_count: 300
```

```
Valid_count: 300
```

```
Shutil images: 100%|██████████| 150
0/1500 [00:00<00:00, 1801.40image/s]
```

```
Class_name: dogs
```

```
Train_count: 900
```

```
Test_count: 300
```

```
Valid_count: 300
```

```
Shutil images: 100%|██████████| 150
0/1500 [00:00<00:00, 1820.39image/s]
```

---

```
Выбранная модель: regnet_x_3_2gf
```

```
Пользовательское название модели: regnet_x_3_2gf_Exp3
```

```
Выбранный оптимизатор: SGD
```

---

```
Epoch 1/10 (Train): 100%|██████████| 1
18/118 [00:14<00:00, 7.91sample/s]
Epoch 1/10 (Eval): 100%|██████████| 1
71/71 [00:04<00:00, 16.53sample/s]
```

```
Epoch 1/10, Training Loss: 0.7088177651268769, Validation Loss: 97.09722637456689
Accuracy: 0.4966101694915254, Precision: 0.2466216604424016, Recall: 0.4966101694915
254, F1-score: 0.329573679866403
```

```
Epoch 2/10 (Train): 100%|██████████| 1
18/118 [00:14<00:00, 8.00sample/s]
Epoch 2/10 (Eval): 100%|██████████| 1
71/71 [00:04<00:00, 16.32sample/s]
```

```
Epoch 2/10, Training Loss: 0.7132540119280981, Validation Loss: 808.622695146981
Accuracy: 0.4966101694915254, Precision: 0.2466216604424016, Recall: 0.4966101694915
254, F1-score: 0.329573679866403
```

```
Epoch 3/10 (Train): 100%|██████████| 1
18/118 [00:14<00:00, 7.99sample/s]
Epoch 3/10 (Eval): 100%|██████████| 1
71/71 [00:04<00:00, 16.26sample/s]
```

```
Epoch 3/10, Training Loss: 0.7055055797303774, Validation Loss: 2.4371459673100944
Accuracy: 0.49887005649717514, Precision: 0.5228213837324007, Recall: 0.498870056497
17514, F1-score: 0.3524633986276775
```

```
Epoch 4/10 (Train): 100%|██████████| 1
18/118 [00:14<00:00, 7.94sample/s]
Epoch 4/10 (Eval): 100%|██████████| 1
71/71 [00:04<00:00, 16.36sample/s]
```

Epoch 4/10, Training Loss: 0.7055509563838466, Validation Loss: 1.2356152845978063  
Accuracy: 0.5011299435028248, Precision: 0.47957621134377554, Recall: 0.501129943502  
8248, F1-score: 0.3559603296461708

Epoch 5/10 (Train): 100% | ██████████ | 1  
18/118 [00:14<00:00, 7.99sample/s]  
Epoch 5/10 (Eval): 100% | ██████████ |  
71/71 [00:04<00:00, 16.58sample/s]

Epoch 5/10, Training Loss: 0.7003845938532954, Validation Loss: 0.7943771350181709  
Accuracy: 0.5485875706214689, Precision: 0.5794407737240256, Recall: 0.5485875706214  
689, F1-score: 0.5040470734160749

Epoch 6/10 (Train): 100% | ██████████ | 1  
18/118 [00:14<00:00, 7.97sample/s]  
Epoch 6/10 (Eval): 100% | ██████████ |  
71/71 [00:04<00:00, 16.75sample/s]

Epoch 6/10, Training Loss: 0.7047142422492587, Validation Loss: 4.071226851046506  
Accuracy: 0.5028248587570622, Precision: 0.4519076199164546, Recall: 0.5028248587570  
622, F1-score: 0.3388511481311395

Epoch 7/10 (Train): 100% | ██████████ | 1  
18/118 [00:14<00:00, 7.97sample/s]  
Epoch 7/10 (Eval): 100% | ██████████ |  
71/71 [00:04<00:00, 16.62sample/s]

Epoch 7/10, Training Loss: 0.7094552303146844, Validation Loss: 4.053728629303517  
Accuracy: 0.4966101694915254, Precision: 0.49830508474576274, Recall: 0.496610169491  
5254, F1-score: 0.33550312517596714

Epoch 8/10 (Train): 100% | ██████████ | 1  
18/118 [00:14<00:00, 7.97sample/s]  
Epoch 8/10 (Eval): 100% | ██████████ |  
71/71 [00:04<00:00, 16.34sample/s]

Epoch 8/10, Training Loss: 0.698454862270792, Validation Loss: 0.7891513786073459  
Accuracy: 0.5050847457627119, Precision: 0.5666703640576105, Recall: 0.5050847457627  
119, F1-score: 0.3670064641985904

Epoch 9/10 (Train): 100% | ██████████ | 1  
18/118 [00:14<00:00, 7.99sample/s]  
Epoch 9/10 (Eval): 100% | ██████████ |  
71/71 [00:04<00:00, 16.11sample/s]

Epoch 9/10, Training Loss: 0.6967557542998744, Validation Loss: 1.1351992606611576  
Accuracy: 0.4994350282485876, Precision: 0.5493429168083143, Recall: 0.4994350282485  
876, F1-score: 0.3454151010197653

Epoch 10/10 (Train): 100% | ██████████ | 1  
18/118 [00:14<00:00, 7.90sample/s]  
Epoch 10/10 (Eval): 100% | ██████████ |  
71/71 [00:04<00:00, 16.50sample/s]

Epoch 10/10, Training Loss: 0.6934483930702823, Validation Loss: 0.757216407754327  
Accuracy: 0.5248587570621469, Precision: 0.5855036353076023, Recall: 0.5248587570621  
469, F1-score: 0.42876111024133085

Тренировка завершена!

Test: 100% | ██████████ |  
72/72 [00:04<00:00, 14.93sample/s]

```
Test Accuracy: 0.5284280936454849
Precision: 0.5747240810100948, Recall: 0.5284280936454849, F1-score: 0.4341924431430
9224
Accuracy of cats : 11 %
Accuracy of dogs : 93 %
```

```
Class_name: cats
```

```
Train_count: 900
```

```
Test_count: 300
```

```
Valid_count: 300
```

```
Shutil images: 100%|██████████| 150
0/1500 [00:00<00:00, 1805.83image/s]
```

```
Class_name: dogs
```

```
Train_count: 900
```

```
Test_count: 300
```

```
Valid_count: 300
```

```
Shutil images: 100%|██████████| 150
0/1500 [00:00<00:00, 1753.73image/s]
```

---

```
Выбранная модель: regnet_x_400mf
```

```
Пользовательское название модели: regnet_x_400mf_Exp3
```

```
Выбранный оптимизатор: SGD
```

---

```
Epoch 1/10 (Train): 100%|██████████| 1
18/118 [00:12<00:00, 9.45sample/s]
Epoch 1/10 (Eval): 100%|██████████| 1
71/71 [00:03<00:00, 18.04sample/s]
```

```
Epoch 1/10, Training Loss: 0.785356114681502, Validation Loss: nan
Accuracy: 0.5033898305084745, Precision: 0.25340132145935074, Recall: 0.503389830508
4745, F1-score: 0.3371066057745591
```

```
Epoch 2/10 (Train): 100%|██████████| 1
18/118 [00:12<00:00, 9.31sample/s]
Epoch 2/10 (Eval): 100%|██████████| 1
71/71 [00:03<00:00, 17.80sample/s]
```

```
Epoch 2/10, Training Loss: 0.7541666831859398, Validation Loss: 2.0534841485668793
Accuracy: 0.503954802259887, Precision: 0.7501547364689425, Recall: 0.50395480225988
7, F1-score: 0.3383619970573583
```

```
Epoch 3/10 (Train): 100%|██████████| 1
18/118 [00:12<00:00, 9.38sample/s]
Epoch 3/10 (Eval): 100%|██████████| 1
71/71 [00:03<00:00, 18.09sample/s]
```

```
Epoch 3/10, Training Loss: 0.7602923539959235, Validation Loss: 3.1526946133985265
Accuracy: 0.4966101694915254, Precision: 0.2466216604424016, Recall: 0.4966101694915
254, F1-score: 0.329573679866403
```

```
Epoch 4/10 (Train): 100%|██████████| 1
18/118 [00:12<00:00, 9.42sample/s]
Epoch 4/10 (Eval): 100%|██████████| 1
71/71 [00:03<00:00, 17.92sample/s]
```

Epoch 4/10, Training Loss: 0.7478496842162705, Validation Loss: 1.387355114633249  
Accuracy: 0.4966101694915254, Precision: 0.2466216604424016, Recall: 0.4966101694915  
254, F1-score: 0.329573679866403

Epoch 5/10 (Train): 100% | 18/118 [00:12<00:00, 9.37sample/s]

Epoch 5/10 (Eval): 100% | 71/71 [00:03<00:00, 18.04sample/s]

Epoch 5/10, Training Loss: 0.7247768518497744, Validation Loss: 1.2187429840366046  
Accuracy: 0.5033898305084745, Precision: 0.25340132145935074, Recall: 0.503389830508  
4745, F1-score: 0.3371066057745591

Epoch 6/10 (Train): 100% | 18/118 [00:12<00:00, 9.33sample/s]

Epoch 6/10 (Eval): 100% | 71/71 [00:03<00:00, 18.01sample/s]

Epoch 6/10, Training Loss: 0.7325375297463926, Validation Loss: 1.1168453741376683  
Accuracy: 0.4966101694915254, Precision: 0.2466216604424016, Recall: 0.4966101694915  
254, F1-score: 0.329573679866403

Epoch 7/10 (Train): 100% | 18/118 [00:12<00:00, 9.42sample/s]

Epoch 7/10 (Eval): 100% | 71/71 [00:03<00:00, 18.23sample/s]

Epoch 7/10, Training Loss: 0.7442151506062819, Validation Loss: 1.3420080411442592  
Accuracy: 0.4966101694915254, Precision: 0.2466216604424016, Recall: 0.4966101694915  
254, F1-score: 0.329573679866403

Epoch 8/10 (Train): 100% | 18/118 [00:12<00:00, 9.41sample/s]

Epoch 8/10 (Eval): 100% | 71/71 [00:03<00:00, 17.99sample/s]

Epoch 8/10, Training Loss: 0.7364424713368458, Validation Loss: 1.247936279655008  
Accuracy: 0.4966101694915254, Precision: 0.2466216604424016, Recall: 0.4966101694915  
254, F1-score: 0.329573679866403

Epoch 9/10 (Train): 100% | 18/118 [00:12<00:00, 9.47sample/s]

Epoch 9/10 (Eval): 100% | 71/71 [00:03<00:00, 18.26sample/s]

Epoch 9/10, Training Loss: 0.7222774494655803, Validation Loss: 1.0637829235339231  
Accuracy: 0.4966101694915254, Precision: 0.2466216604424016, Recall: 0.4966101694915  
254, F1-score: 0.329573679866403

Epoch 10/10 (Train): 100% | 18/118 [00:12<00:00, 9.42sample/s]

Epoch 10/10 (Eval): 100% | 71/71 [00:03<00:00, 17.95sample/s]

Epoch 10/10, Training Loss: 0.7176418717968407, Validation Loss: 1.21557705590533  
Accuracy: 0.4966101694915254, Precision: 0.2466216604424016, Recall: 0.4966101694915  
254, F1-score: 0.329573679866403

Тренировка завершена!

Test: 100% | 72/72 [00:04<00:00, 15.71sample/s]

```
Test Accuracy: 0.5039018952062431
Precision: 0.25391711999244354, Recall: 0.5039018952062431, F1-score: 0.337677771138
95014
Accuracy of cats : 0 %
Accuracy of dogs : 100 %
```

```
Class_name: cats
```

```
Train_count: 900
```

```
Test_count: 300
```

```
Valid_count: 300
```

```
Shutil images: 100%|██████████| 150
0/1500 [00:00<00:00, 1852.96image/s]
```

```
Class_name: dogs
```

```
Train_count: 900
```

```
Test_count: 300
```

```
Valid_count: 300
```

```
Shutil images: 100%|██████████| 150
0/1500 [00:00<00:00, 1835.75image/s]
```

---

```
-----
```

Выбранная модель: regnet\_x\_800mf

Пользовательское название модели: regnet\_x\_800mf\_Exp3

Выбранный оптимизатор: SGD

```
-----
```

```
Epoch 1/10 (Train): 100%|██████████| 1
18/118 [00:11<00:00, 10.24sample/s]
Epoch 1/10 (Eval): 100%|██████████| 1
71/71 [00:03<00:00, 20.11sample/s]
```

```
Epoch 1/10, Training Loss: 0.7258630368250001, Validation Loss: 110529.2455861582
Accuracy: 0.5033898305084745, Precision: 0.25340132145935074, Recall: 0.503389830508
4745, F1-score: 0.3371066057745591
```

```
Epoch 2/10 (Train): 100%|██████████| 1
18/118 [00:11<00:00, 10.27sample/s]
Epoch 2/10 (Eval): 100%|██████████| 1
71/71 [00:03<00:00, 20.23sample/s]
```

```
Epoch 2/10, Training Loss: 0.7316228451789119, Validation Loss: 969.882969398283
Accuracy: 0.5033898305084745, Precision: 0.25340132145935074, Recall: 0.503389830508
4745, F1-score: 0.3371066057745591
```

```
Epoch 3/10 (Train): 100%|██████████| 1
18/118 [00:11<00:00, 10.27sample/s]
Epoch 3/10 (Eval): 100%|██████████| 1
71/71 [00:03<00:00, 19.68sample/s]
```

```
Epoch 3/10, Training Loss: 0.7171698763447107, Validation Loss: 1.667389785881433
Accuracy: 0.5022598870056497, Precision: 0.46004753089990547, Recall: 0.502259887005
6497, F1-score: 0.34154690765372125
```

```
Epoch 4/10 (Train): 100%|██████████| 1
18/118 [00:11<00:00, 10.14sample/s]
Epoch 4/10 (Eval): 100%|██████████| 1
71/71 [00:03<00:00, 20.06sample/s]
```

```
Epoch 4/10, Training Loss: 0.7148835942790839, Validation Loss: 0.8445210772550712
Accuracy: 0.5050847457627119, Precision: 0.5157453269663578, Recall: 0.5050847457627119, F1-score: 0.3650154189682961
Epoch 5/10 (Train): 100%|██████████| 1
18/118 [00:11<00:00, 10.31sample/s]
Epoch 5/10 (Eval): 100%|██████████| 1
71/71 [00:03<00:00, 19.94sample/s]
Epoch 5/10, Training Loss: 0.7040132343443143, Validation Loss: 1.8977726364539842
Accuracy: 0.49830508474576274, Precision: 0.7504302034473829, Recall: 0.49830508474576274, F1-score: 0.3333258014084184
Epoch 6/10 (Train): 100%|██████████| 1
18/118 [00:11<00:00, 10.26sample/s]
Epoch 6/10 (Eval): 100%|██████████| 1
71/71 [00:03<00:00, 20.16sample/s]
Epoch 6/10, Training Loss: 0.7101171093898038, Validation Loss: 1.31652970106925
Accuracy: 0.5033898305084745, Precision: 0.25340132145935074, Recall: 0.5033898305084745, F1-score: 0.3371066057745591
Epoch 7/10 (Train): 100%|██████████| 1
18/118 [00:11<00:00, 10.22sample/s]
Epoch 7/10 (Eval): 100%|██████████| 1
71/71 [00:03<00:00, 19.98sample/s]
Epoch 00007: reducing learning rate of group 0 to 1.0000e-04.

Epoch 7/10, Training Loss: 0.708317747791581, Validation Loss: 0.8460972445075121
Accuracy: 0.5033898305084745, Precision: 0.25340132145935074, Recall: 0.5033898305084745, F1-score: 0.3371066057745591
Epoch 8/10 (Train): 100%|██████████| 1
18/118 [00:11<00:00, 10.39sample/s]
Epoch 8/10 (Eval): 100%|██████████| 1
71/71 [00:03<00:00, 20.01sample/s]
Epoch 8/10, Training Loss: 0.707079411245582, Validation Loss: 0.6981954190690639
Accuracy: 0.5214689265536723, Precision: 0.5273033000814963, Recall: 0.5214689265536723, F1-score: 0.501446452562472
Epoch 9/10 (Train): 100%|██████████| 1
18/118 [00:11<00:00, 10.26sample/s]
Epoch 9/10 (Eval): 100%|██████████| 1
71/71 [00:03<00:00, 19.94sample/s]
Epoch 9/10, Training Loss: 0.6919311093534416, Validation Loss: 0.6911149508198776
Accuracy: 0.5378531073446328, Precision: 0.5403316827910112, Recall: 0.5378531073446328, F1-score: 0.532923419710706
Epoch 10/10 (Train): 100%|██████████| 1
18/118 [00:11<00:00, 10.27sample/s]
Epoch 10/10 (Eval): 100%|██████████| 1
71/71 [00:03<00:00, 19.92sample/s]
Epoch 10/10, Training Loss: 0.6941716746157843, Validation Loss: 0.6892669987207078
Accuracy: 0.5378531073446328, Precision: 0.5381516867898294, Recall: 0.5378531073446328, F1-score: 0.5375727013302916
Тренировка завершена!
Test: 100%|██████████| 1
72/72 [00:04<00:00, 17.71sample/s]
```

```
Test Accuracy: 0.5468227424749164
Precision: 0.546756326720539, Recall: 0.5468227424749164, F1-score: 0.54662619350333
05
Accuracy of cats : 52 %
Accuracy of dogs : 56 %
```

```
Class_name: cats
```

```
Train_count: 900
```

```
Test_count: 300
```

```
Valid_count: 300
```

```
Shutil images: 100%|██████████| 150
0/1500 [00:00<00:00, 1815.89image/s]
```

```
Class_name: dogs
```

```
Train_count: 900
```

```
Test_count: 300
```

```
Valid_count: 300
```

```
Shutil images: 100%|██████████| 150
0/1500 [00:00<00:00, 1824.87image/s]
```

---

```
-----
```

Выбранная модель: regnet\_y\_16gf

Пользовательское название модели: regnet\_y\_16gf\_Exp3

Выбранный оптимизатор: SGD

```
-----
```

```
Epoch 1/10 (Train): 100%|██████████| 1
18/118 [00:17<00:00, 6.62sample/s]
Epoch 1/10 (Eval): 100%|██████████| 1
71/71 [00:05<00:00, 14.13sample/s]
```

```
Epoch 1/10, Training Loss: 0.7003505794218119, Validation Loss: 2.719915042657637
Accuracy: 0.4977401129943503, Precision: 0.6244414265696681, Recall: 0.4977401129943
503, F1-score: 0.33307126176149393
```

```
Epoch 2/10 (Train): 100%|██████████| 1
18/118 [00:17<00:00, 6.58sample/s]
Epoch 2/10 (Eval): 100%|██████████| 1
71/71 [00:05<00:00, 13.99sample/s]
```

```
Epoch 2/10, Training Loss: 0.7017039484303045, Validation Loss: 13.412632862832082
Accuracy: 0.4971751412429379, Precision: 0.7501509039867397, Recall: 0.4971751412429
379, F1-score: 0.3308268179758882
```

```
Epoch 3/10 (Train): 100%|██████████| 1
18/118 [00:18<00:00, 6.51sample/s]
Epoch 3/10 (Eval): 100%|██████████| 1
71/71 [00:05<00:00, 13.87sample/s]
```

```
Epoch 3/10, Training Loss: 0.7063914712414053, Validation Loss: 219.74135896969665
Accuracy: 0.4966101694915254, Precision: 0.2466216604424016, Recall: 0.4966101694915
254, F1-score: 0.329573679866403
```

```
Epoch 4/10 (Train): 100%|██████████| 1
18/118 [00:18<00:00, 6.55sample/s]
Epoch 4/10 (Eval): 100%|██████████| 1
71/71 [00:05<00:00, 13.90sample/s]
```

Epoch 00004: reducing learning rate of group 0 to 1.0000e-04.

Epoch 4/10, Training Loss: 0.7064058180956994, Validation Loss: 230.4018332898609  
Accuracy: 0.4966101694915254, Precision: 0.2466216604424016, Recall: 0.4966101694915  
254, F1-score: 0.329573679866403

Epoch 5/10 (Train): 100% | ██████████ | 1  
18/118 [00:18<00:00, 6.49sample/s]  
Epoch 5/10 (Eval): 100% | ██████████ |  
71/71 [00:05<00:00, 14.01sample/s]

Epoch 5/10, Training Loss: 0.7168698995103595, Validation Loss: 0.7010912194763873  
Accuracy: 0.5163841807909605, Precision: 0.5178326908380045, Recall: 0.5163841807909  
605, F1-score: 0.5114522069132349

Epoch 6/10 (Train): 100% | ██████████ | 1  
18/118 [00:18<00:00, 6.50sample/s]  
Epoch 6/10 (Eval): 100% | ██████████ |  
71/71 [00:05<00:00, 13.91sample/s]

Epoch 6/10, Training Loss: 0.6984034220567731, Validation Loss: 0.7044187585512797  
Accuracy: 0.5186440677966102, Precision: 0.5206186180254555, Recall: 0.5186440677966  
102, F1-score: 0.49808844499336236

Epoch 7/10 (Train): 100% | ██████████ | 1  
18/118 [00:18<00:00, 6.48sample/s]  
Epoch 7/10 (Eval): 100% | ██████████ |  
71/71 [00:05<00:00, 13.77sample/s]

Epoch 7/10, Training Loss: 0.6963058508021002, Validation Loss: 0.7026083762362852  
Accuracy: 0.5271186440677966, Precision: 0.5279949463468241, Recall: 0.5271186440677  
966, F1-score: 0.5196288044554062

Epoch 8/10 (Train): 100% | ██████████ | 1  
18/118 [00:18<00:00, 6.42sample/s]  
Epoch 8/10 (Eval): 100% | ██████████ |  
71/71 [00:05<00:00, 13.73sample/s]

Epoch 00008: reducing learning rate of group 0 to 1.0000e-05.

Epoch 8/10, Training Loss: 0.6945526683607577, Validation Loss: 0.7048792791905376  
Accuracy: 0.515819209039548, Precision: 0.5162368739820625, Recall: 0.51581920903954  
8, F1-score: 0.5048822889017981

Epoch 9/10 (Train): 100% | ██████████ | 1  
18/118 [00:18<00:00, 6.43sample/s]  
Epoch 9/10 (Eval): 100% | ██████████ |  
71/71 [00:05<00:00, 13.95sample/s]

Epoch 9/10, Training Loss: 0.6931042106528031, Validation Loss: 0.7130405887708826  
Accuracy: 0.5186440677966102, Precision: 0.5189507878327229, Recall: 0.5186440677966  
102, F1-score: 0.5112289925227698

Epoch 10/10 (Train): 100% | ██████████ | 1  
18/118 [00:18<00:00, 6.46sample/s]  
Epoch 10/10 (Eval): 100% | ██████████ |  
71/71 [00:05<00:00, 13.71sample/s]

Epoch 10/10, Training Loss: 0.6914895602634975, Validation Loss: 0.7043759137560419  
Accuracy: 0.5180790960451978, Precision: 0.5218082949945344, Recall: 0.5180790960451  
978, F1-score: 0.48582065146902736

Тренировка завершена!

Test: 100% | ██████████ |  
72/72 [00:05<00:00, 13.28sample/s]

```
Test Accuracy: 0.5150501672240803
Precision: 0.5222663048750005, Recall: 0.5150501672240803, F1-score: 0.4848250427318
7427
Accuracy of cats : 75 %
Accuracy of dogs : 27 %
```

```
Class_name: cats
Train_count: 900
Test_count: 300
Valid_count: 300
```

```
Shutil images: 100%|██████████| 150
0/1500 [00:00<00:00, 1799.02image/s]
```

```
Class_name: dogs
Train_count: 900
Test_count: 300
Valid_count: 300
```

```
Shutil images: 100%|██████████| 150
0/1500 [00:00<00:00, 1785.29image/s]
```

---

```
-----  
Выбранная модель: regnet_y_1_6gf
Пользовательское название модели: regnet_y_1_6gf_Exp3
Выбранный оптимизатор: SGD
```

---

```
Epoch 1/10 (Train): 100%|██████████| 1
18/118 [00:20<00:00, 5.80sample/s]
Epoch 1/10 (Eval): 100%|██████████| 1
71/71 [00:05<00:00, 13.30sample/s]
```

```
Epoch 1/10, Training Loss: 0.710109683396632, Validation Loss: 9322.156037777157
Accuracy: 0.48700564971751414, Precision: 0.3861268968280689, Recall: 0.487005649717
51414, F1-score: 0.33575125322339744
```

```
Epoch 2/10 (Train): 100%|██████████| 1
18/118 [00:20<00:00, 5.81sample/s]
Epoch 2/10 (Eval): 100%|██████████| 1
71/71 [00:05<00:00, 13.54sample/s]
```

```
Epoch 2/10, Training Loss: 0.7085042340007451, Validation Loss: 3628.678047221459
Accuracy: 0.5033898305084745, Precision: 0.25340132145935074, Recall: 0.503389830508
4745, F1-score: 0.3371066057745591
```

```
Epoch 3/10 (Train): 100%|██████████| 1
18/118 [00:20<00:00, 5.85sample/s]
Epoch 3/10 (Eval): 100%|██████████| 1
71/71 [00:05<00:00, 13.46sample/s]
```

```
Epoch 3/10, Training Loss: 0.7099558830627903, Validation Loss: 2418.833759973174
Accuracy: 0.4943502824858757, Precision: 0.43481123050460935, Recall: 0.494350282485
8757, F1-score: 0.3344642699774107
```

```
Epoch 4/10 (Train): 100%|██████████| 1
18/118 [00:20<00:00, 5.86sample/s]
Epoch 4/10 (Eval): 100%|██████████| 1
71/71 [00:05<00:00, 13.34sample/s]
```

Epoch 4/10, Training Loss: 0.7059691471346258, Validation Loss: 8.482505131323459  
Accuracy: 0.4943502824858757, Precision: 0.49213348603086565, Recall: 0.4943502824858757, F1-score: 0.4018485039620387

Epoch 5/10 (Train): 100% | ██████████ | 1  
18/118 [00:20<00:00, 5.87sample/s]

Epoch 5/10 (Eval): 100% | ██████████ |  
71/71 [00:05<00:00, 13.58sample/s]

Epoch 5/10, Training Loss: 0.7037492204185063, Validation Loss: 11.61106456765684  
Accuracy: 0.4971751412429379, Precision: 0.7501509039867397, Recall: 0.4971751412429379, F1-score: 0.3308268179758882

Epoch 6/10 (Train): 100% | ██████████ | 1  
18/118 [00:20<00:00, 5.83sample/s]

Epoch 6/10 (Eval): 100% | ██████████ |  
71/71 [00:05<00:00, 13.32sample/s]

Epoch 6/10, Training Loss: 0.7097611950833913, Validation Loss: 2.5557888214197537  
Accuracy: 0.5016949152542373, Precision: 0.5176691978774922, Recall: 0.5016949152542373, F1-score: 0.38946403330905993

Epoch 7/10 (Train): 100% | ██████████ | 1  
18/118 [00:20<00:00, 5.81sample/s]

Epoch 7/10 (Eval): 100% | ██████████ |  
71/71 [00:05<00:00, 13.43sample/s]

Epoch 7/10, Training Loss: 0.7035686384099685, Validation Loss: 231.86863012906522  
Accuracy: 0.48135593220338985, Precision: 0.4761979533035405, Recall: 0.48135593220338985, F1-score: 0.44064167888840167

Epoch 8/10 (Train): 100% | ██████████ | 1  
18/118 [00:20<00:00, 5.85sample/s]

Epoch 8/10 (Eval): 100% | ██████████ |  
71/71 [00:05<00:00, 13.52sample/s]

Epoch 8/10, Training Loss: 0.7012325581303216, Validation Loss: 0.9481784516977052  
Accuracy: 0.5056497175141242, Precision: 0.5535747198223883, Recall: 0.5056497175141242, F1-score: 0.37562028104195794

Epoch 9/10 (Train): 100% | ██████████ | 1  
18/118 [00:20<00:00, 5.81sample/s]

Epoch 9/10 (Eval): 100% | ██████████ |  
71/71 [00:05<00:00, 13.62sample/s]

Epoch 9/10, Training Loss: 0.701555715325102, Validation Loss: 24.704219656712297  
Accuracy: 0.49491525423728816, Precision: 0.4779978428987093, Recall: 0.49491525423728816, F1-score: 0.3970953390607584

Epoch 10/10 (Train): 100% | ██████████ | 1  
18/118 [00:20<00:00, 5.89sample/s]

Epoch 10/10 (Eval): 100% | ██████████ |  
71/71 [00:05<00:00, 13.62sample/s]

Epoch 10/10, Training Loss: 0.7008196402924238, Validation Loss: 1.201395778753663  
Accuracy: 0.5152542372881356, Precision: 0.524918010889848, Recall: 0.5152542372881356, F1-score: 0.448276391096367

Тренировка завершена!

Test: 100% | ██████████ |  
72/72 [00:05<00:00, 12.73sample/s]

```
Test Accuracy: 0.5139353400222966
Precision: 0.5356583983122246, Recall: 0.5139353400222966, F1-score: 0.4404713917414
991
Accuracy of cats : 87 %
Accuracy of dogs : 15 %
```

```
Class_name: cats
```

```
Train_count: 900
```

```
Test_count: 300
```

```
Valid_count: 300
```

```
Shutil images: 100%|██████████| 150
0/1500 [00:00<00:00, 1821.97image/s]
```

```
Class_name: dogs
```

```
Train_count: 900
```

```
Test_count: 300
```

```
Valid_count: 300
```

```
Shutil images: 100%|██████████| 150
0/1500 [00:00<00:00, 1747.82image/s]
```

---

```
-----
```

Выбранная модель: regnet\_y\_3\_2gf

Пользовательское название модели: regnet\_y\_3\_2gf\_Exp3

Выбранный оптимизатор: SGD

```
-----
```

```
Epoch 1/10 (Train): 100%|██████████| 1
18/118 [00:18<00:00, 6.34sample/s]
Epoch 1/10 (Eval): 100%|██████████| 1
71/71 [00:04<00:00, 14.30sample/s]
```

```
Epoch 1/10, Training Loss: 0.7081543364634029, Validation Loss: 676.8360127598802
Accuracy: 0.507909604519774, Precision: 0.564972645355074, Recall: 0.50790960451977
4, F1-score: 0.3584194813471668
```

```
Epoch 2/10 (Train): 100%|██████████| 1
18/118 [00:18<00:00, 6.47sample/s]
Epoch 2/10 (Eval): 100%|██████████| 1
71/71 [00:04<00:00, 14.55sample/s]
```

```
Epoch 2/10, Training Loss: 0.7052487385900397, Validation Loss: 14.415082415576371
Accuracy: 0.4966101694915254, Precision: 0.49830508474576274, Recall: 0.496610169491
5254, F1-score: 0.33550312517596714
```

```
Epoch 3/10 (Train): 100%|██████████| 1
18/118 [00:18<00:00, 6.50sample/s]
Epoch 3/10 (Eval): 100%|██████████| 1
71/71 [00:04<00:00, 14.51sample/s]
```

```
Epoch 3/10, Training Loss: 0.7039540675268219, Validation Loss: 53.5723452110075
Accuracy: 0.4847457627118644, Precision: 0.48427187523062165, Recall: 0.484745762711
8644, F1-score: 0.4834155992992108
```

```
Epoch 4/10 (Train): 100%|██████████| 1
18/118 [00:18<00:00, 6.45sample/s]
Epoch 4/10 (Eval): 100%|██████████| 1
71/71 [00:04<00:00, 14.47sample/s]
```

Epoch 4/10, Training Loss: 0.7011953391649098, Validation Loss: 319.877535202241  
Accuracy: 0.4966101694915254, Precision: 0.2466216604424016, Recall: 0.4966101694915  
254, F1-score: 0.329573679866403

Epoch 5/10 (Train): 100% | ██████████ | 1  
18/118 [00:18<00:00, 6.54sample/s]  
Epoch 5/10 (Eval): 100% | ██████████ |  
71/71 [00:04<00:00, 14.41sample/s]

Epoch 5/10, Training Loss: 0.7001045681765368, Validation Loss: 2.017725637403585  
Accuracy: 0.5096045197740113, Precision: 0.517822986630673, Recall: 0.50960451977401  
13, F1-score: 0.4208509037101666

Epoch 6/10 (Train): 100% | ██████████ | 1  
18/118 [00:18<00:00, 6.50sample/s]  
Epoch 6/10 (Eval): 100% | ██████████ |  
71/71 [00:04<00:00, 14.32sample/s]

Epoch 6/10, Training Loss: 0.7051042650590102, Validation Loss: 1.7467946397551035  
Accuracy: 0.4915254237288136, Precision: 0.4739981133797888, Recall: 0.4915254237288  
136, F1-score: 0.367098703888335

Epoch 7/10 (Train): 100% | ██████████ | 1  
18/118 [00:18<00:00, 6.49sample/s]  
Epoch 7/10 (Eval): 100% | ██████████ |  
71/71 [00:04<00:00, 14.29sample/s]

Epoch 7/10, Training Loss: 0.7018225389397152, Validation Loss: 4.678416413860132  
Accuracy: 0.4977401129943503, Precision: 0.5179373796394866, Recall: 0.4977401129943  
503, F1-score: 0.34366730170969345

Epoch 8/10 (Train): 100% | ██████████ | 1  
18/118 [00:18<00:00, 6.49sample/s]  
Epoch 8/10 (Eval): 100% | ██████████ |  
71/71 [00:04<00:00, 14.34sample/s]

Epoch 8/10, Training Loss: 0.7060643458154539, Validation Loss: 4.87433994626679  
Accuracy: 0.496045197740113, Precision: 0.4469352467877186, Recall: 0.49604519774011  
3, F1-score: 0.356047213514938

Epoch 9/10 (Train): 100% | ██████████ | 1  
18/118 [00:18<00:00, 6.44sample/s]  
Epoch 9/10 (Eval): 100% | ██████████ |  
71/71 [00:04<00:00, 14.23sample/s]

Epoch 9/10, Training Loss: 0.702567569193413, Validation Loss: 0.8248288117896365  
Accuracy: 0.49830508474576274, Precision: 0.5147686243205406, Recall: 0.498305084745  
76274, F1-score: 0.35396221291400487

Epoch 10/10 (Train): 100% | ██████████ | 1  
18/118 [00:18<00:00, 6.46sample/s]  
Epoch 10/10 (Eval): 100% | ██████████ |  
71/71 [00:04<00:00, 14.57sample/s]

Epoch 10/10, Training Loss: 0.7015294633087685, Validation Loss: 0.903772476197636  
Accuracy: 0.5101694915254237, Precision: 0.5318046403827515, Recall: 0.5101694915254  
237, F1-score: 0.4247416191042049

Тренировка завершена!

Test: 100% | ██████████ |  
72/72 [00:05<00:00, 13.65sample/s]

```
Test Accuracy: 0.512263099219621
Precision: 0.5214809037533628, Recall: 0.512263099219621, F1-score: 0.43128037721847
906
Accuracy of cats : 13 %
Accuracy of dogs : 88 %
```

```
Class_name: cats
```

```
Train_count: 900
```

```
Test_count: 300
```

```
Valid_count: 300
```

```
Shutil images: 100%|██████████| 150
0/1500 [00:00<00:00, 1817.38image/s]
```

```
Class_name: dogs
```

```
Train_count: 900
```

```
Test_count: 300
```

```
Valid_count: 300
```

```
Shutil images: 100%|██████████| 150
0/1500 [00:00<00:00, 1812.46image/s]
```

---

```
Выбранная модель: regnet_y_400mf
```

```
Пользовательское название модели: regnet_y_400mf_Exp3
```

```
Выбранный оптимизатор: SGD
```

---

```
Epoch 1/10 (Train): 100%|██████████| 1
18/118 [00:13<00:00, 8.45sample/s]
Epoch 1/10 (Eval): 100%|██████████| 1
71/71 [00:04<00:00, 15.79sample/s]
```

```
Epoch 1/10, Training Loss: 0.7400878786185141, Validation Loss: 50751111812252.2
Accuracy: 0.4966101694915254, Precision: 0.2466216604424016, Recall: 0.4966101694915
254, F1-score: 0.329573679866403
```

```
Epoch 2/10 (Train): 100%|██████████| 1
18/118 [00:13<00:00, 8.55sample/s]
Epoch 2/10 (Eval): 100%|██████████| 1
71/71 [00:04<00:00, 15.97sample/s]
```

```
Epoch 2/10, Training Loss: 0.7242894297744505, Validation Loss: 15.319984215674763
Accuracy: 0.496045197740113, Precision: 0.49608180404720675, Recall: 0.4960451977401
13, F1-score: 0.3839964234281284
```

```
Epoch 3/10 (Train): 100%|██████████| 1
18/118 [00:13<00:00, 8.60sample/s]
Epoch 3/10 (Eval): 100%|██████████| 1
71/71 [00:04<00:00, 15.95sample/s]
```

```
Epoch 3/10, Training Loss: 0.7235118279250126, Validation Loss: 205.90647657220458
Accuracy: 0.5022598870056497, Precision: 0.4971636672743022, Recall: 0.5022598870056
497, F1-score: 0.3852811568745487
```

```
Epoch 4/10 (Train): 100%|██████████| 1
18/118 [00:13<00:00, 8.62sample/s]
Epoch 4/10 (Eval): 100%|██████████| 1
71/71 [00:04<00:00, 15.69sample/s]
```

Epoch 4/10, Training Loss: 0.7213995433269261, Validation Loss: 1.2968749190959554  
Accuracy: 0.49548022598870056, Precision: 0.24633886801135058, Recall: 0.49548022598  
870056, F1-score: 0.32907224680322467

Epoch 5/10 (Train): 100% | ██████████ | 1  
18/118 [00:13<00:00, 8.64sample/s]  
Epoch 5/10 (Eval): 100% | ██████████ |  
71/71 [00:04<00:00, 15.99sample/s]

Epoch 5/10, Training Loss: 0.7152872710136705, Validation Loss: 1.3010215543757724  
Accuracy: 0.5090395480225989, Precision: 0.5199717514124294, Recall: 0.5090395480225  
989, F1-score: 0.4063963537457473

Epoch 6/10 (Train): 100% | ██████████ | 1  
18/118 [00:13<00:00, 8.63sample/s]  
Epoch 6/10 (Eval): 100% | ██████████ |  
71/71 [00:04<00:00, 16.21sample/s]

Epoch 6/10, Training Loss: 0.7017318753453045, Validation Loss: 1.2233888232438577  
Accuracy: 0.5022598870056497, Precision: 0.6141226777333902, Recall: 0.5022598870056  
497, F1-score: 0.347708683928905

Epoch 7/10 (Train): 100% | ██████████ | 1  
18/118 [00:13<00:00, 8.65sample/s]  
Epoch 7/10 (Eval): 100% | ██████████ |  
71/71 [00:04<00:00, 15.81sample/s]

Epoch 7/10, Training Loss: 0.7116656901692986, Validation Loss: 1.013818112722898  
Accuracy: 0.5005649717514125, Precision: 0.5920206676852428, Recall: 0.5005649717514  
125, F1-score: 0.34407129507728845

Epoch 8/10 (Train): 100% | ██████████ | 1  
18/118 [00:13<00:00, 8.58sample/s]  
Epoch 8/10 (Eval): 100% | ██████████ |  
71/71 [00:04<00:00, 15.50sample/s]

Epoch 8/10, Training Loss: 0.7070098135745126, Validation Loss: 2.0268291511104604  
Accuracy: 0.496045197740113, Precision: 0.4702008681508003, Recall: 0.49604519774011  
3, F1-score: 0.3332907036466358

Epoch 9/10 (Train): 100% | ██████████ | 1  
18/118 [00:13<00:00, 8.71sample/s]  
Epoch 9/10 (Eval): 100% | ██████████ |  
71/71 [00:04<00:00, 15.74sample/s]

Epoch 9/10, Training Loss: 0.7170317453712286, Validation Loss: 0.7657149757369089  
Accuracy: 0.5129943502824859, Precision: 0.5295365554486524, Recall: 0.5129943502824  
859, F1-score: 0.4174026414867854

Epoch 10/10 (Train): 100% | ██████████ | 1  
18/118 [00:13<00:00, 8.63sample/s]  
Epoch 10/10 (Eval): 100% | ██████████ |  
71/71 [00:04<00:00, 15.50sample/s]

Epoch 10/10, Training Loss: 0.7072237886676866, Validation Loss: 0.7900571051963978  
Accuracy: 0.5022598870056497, Precision: 0.4766077481840194, Recall: 0.5022598870056  
497, F1-score: 0.34540940127467845

Тренировка завершена!

Test: 100% | ██████████ |  
72/72 [00:05<00:00, 14.27sample/s]

```
Test Accuracy: 0.4955406911928651
Precision: 0.48590378208564033, Recall: 0.4955406911928651, F1-score: 0.338398168312
1261
Accuracy of cats : 98 %
Accuracy of dogs : 1 %
```

```
Class_name: cats
```

```
Train_count: 900
```

```
Test_count: 300
```

```
Valid_count: 300
```

```
Shutil images: 100%|██████████| 150
0/1500 [00:00<00:00, 1859.88image/s]
```

```
Class_name: dogs
```

```
Train_count: 900
```

```
Test_count: 300
```

```
Valid_count: 300
```

```
Shutil images: 100%|██████████| 150
0/1500 [00:00<00:00, 1833.69image/s]
```

---

```
Выбранная модель: regnet_y_800mf
```

```
Пользовательское название модели: regnet_y_800mf_Exp3
```

```
Выбранный оптимизатор: SGD
```

---

```
Epoch 1/10 (Train): 100%|██████████| 1
18/118 [00:13<00:00, 8.88sample/s]
Epoch 1/10 (Eval): 100%|██████████| 1
71/71 [00:03<00:00, 17.76sample/s]
```

```
Epoch 1/10, Training Loss: 0.7098415530428688, Validation Loss: 12.152641647911004
Accuracy: 0.5028248587570622, Precision: 0.500823069632859, Recall: 0.50282485875706
22, F1-score: 0.4289156453577766
```

```
Epoch 2/10 (Train): 100%|██████████| 1
18/118 [00:13<00:00, 8.80sample/s]
Epoch 2/10 (Eval): 100%|██████████| 1
71/71 [00:04<00:00, 17.57sample/s]
```

```
Epoch 2/10, Training Loss: 0.7055877171512833, Validation Loss: 24.13632422325231
Accuracy: 0.496045197740113, Precision: 0.41427488897202003, Recall: 0.496045197740
13, F1-score: 0.33032276447782566
```

```
Epoch 3/10 (Train): 100%|██████████| 1
18/118 [00:13<00:00, 8.83sample/s]
Epoch 3/10 (Eval): 100%|██████████| 1
71/71 [00:04<00:00, 17.71sample/s]
```

```
Epoch 3/10, Training Loss: 0.7106509167326694, Validation Loss: 2.0866272177568264
Accuracy: 0.5073446327683616, Precision: 0.5221934403492524, Recall: 0.507344632768
3616, F1-score: 0.4285778782473937
```

```
Epoch 4/10 (Train): 100%|██████████| 1
18/118 [00:13<00:00, 8.84sample/s]
Epoch 4/10 (Eval): 100%|██████████| 1
71/71 [00:03<00:00, 17.94sample/s]
```

Epoch 4/10, Training Loss: 0.7067213057045731, Validation Loss: 16.517388097557113  
Accuracy: 0.5045197740112994, Precision: 0.5103374962830807, Recall: 0.5045197740112  
994, F1-score: 0.3664478718202343

Epoch 5/10 (Train): 100% | ██████████ | 1  
18/118 [00:13<00:00, 8.82sample/s]  
Epoch 5/10 (Eval): 100% | ██████████ |  
71/71 [00:03<00:00, 17.89sample/s]

Epoch 5/10, Training Loss: 0.7058160917569901, Validation Loss: 2.5689071226591444  
Accuracy: 0.49322033898305084, Precision: 0.4694292995140452, Recall: 0.493220338983  
05084, F1-score: 0.3505185516942155

Epoch 6/10 (Train): 100% | ██████████ | 1  
18/118 [00:13<00:00, 8.86sample/s]  
Epoch 6/10 (Eval): 100% | ██████████ |  
71/71 [00:03<00:00, 17.86sample/s]

Epoch 6/10, Training Loss: 0.7064214125326539, Validation Loss: 1.356674546660003  
Accuracy: 0.4966101694915254, Precision: 0.49824312440038376, Recall: 0.496610169491  
5254, F1-score: 0.3633753223954075

Epoch 7/10 (Train): 100% | ██████████ | 1  
18/118 [00:13<00:00, 8.88sample/s]  
Epoch 7/10 (Eval): 100% | ██████████ |  
71/71 [00:04<00:00, 17.60sample/s]

Epoch 7/10, Training Loss: 0.6978445057989552, Validation Loss: 2.4633548327295456  
Accuracy: 0.5180790960451978, Precision: 0.5729627984326591, Recall: 0.5180790960451  
978, F1-score: 0.39812566618632633

Epoch 8/10 (Train): 100% | ██████████ | 1  
18/118 [00:13<00:00, 8.87sample/s]  
Epoch 8/10 (Eval): 100% | ██████████ |  
71/71 [00:03<00:00, 17.86sample/s]

Epoch 8/10, Training Loss: 0.7036509849767691, Validation Loss: 0.788572389695604  
Accuracy: 0.5096045197740113, Precision: 0.5214320756551207, Recall: 0.5096045197740  
113, F1-score: 0.4080890539316364

Epoch 9/10 (Train): 100% | ██████████ | 1  
18/118 [00:13<00:00, 8.89sample/s]  
Epoch 9/10 (Eval): 100% | ██████████ |  
71/71 [00:03<00:00, 17.97sample/s]

Epoch 9/10, Training Loss: 0.7035287519024401, Validation Loss: 1.9220589934348387  
Accuracy: 0.5141242937853108, Precision: 0.5382493247501725, Recall: 0.5141242937853  
108, F1-score: 0.40949769738403835

Epoch 10/10 (Train): 100% | ██████████ | 1  
18/118 [00:13<00:00, 8.86sample/s]  
Epoch 10/10 (Eval): 100% | ██████████ |  
71/71 [00:04<00:00, 17.71sample/s]

Epoch 10/10, Training Loss: 0.7011971827940181, Validation Loss: 0.7453379467719019  
Accuracy: 0.5033898305084745, Precision: 0.5017141537928779, Recall: 0.5033898305084  
745, F1-score: 0.34108419574612403

Тренировка завершена!

Test: 100% | ██████████ |  
72/72 [00:04<00:00, 15.95sample/s]

```
Test Accuracy: 0.49665551839464883
Precision: 0.5261880300243472, Recall: 0.49665551839464883, F1-score: 0.334149409531
6373
Accuracy of cats : 99 %
Accuracy of dogs : 0 %
```

```
Class_name: cats
```

```
Train_count: 900
```

```
Test_count: 300
```

```
Valid_count: 300
```

```
Shutil images: 100%|██████████| 150
0/1500 [00:00<00:00, 1827.72image/s]
```

```
Class_name: dogs
```

```
Train_count: 900
```

```
Test_count: 300
```

```
Valid_count: 300
```

```
Shutil images: 100%|██████████| 150
0/1500 [00:00<00:00, 1829.18image/s]
```

---

```
-----
```

Выбранная модель: regnet\_y\_8gf

Пользовательское название модели: regnet\_y\_8gf\_Exp3

Выбранный оптимизатор: SGD

---

```
Epoch 1/10 (Train): 100%|██████████| 1
18/118 [00:15<00:00, 7.66sample/s]
Epoch 1/10 (Eval): 100%|██████████| 1
71/71 [00:04<00:00, 15.78sample/s]
```

```
Epoch 1/10, Training Loss: 0.70878397843973, Validation Loss: 17.15514365219548
Accuracy: 0.4966101694915254, Precision: 0.2466216604424016, Recall: 0.4966101694915
254, F1-score: 0.329573679866403
```

```
Epoch 2/10 (Train): 100%|██████████| 1
18/118 [00:15<00:00, 7.68sample/s]
Epoch 2/10 (Eval): 100%|██████████| 1
71/71 [00:04<00:00, 15.86sample/s]
```

```
Epoch 2/10, Training Loss: 0.709142899908436, Validation Loss: 4.644213405958677
Accuracy: 0.5005649717514125, Precision: 0.5367659164244218, Recall: 0.5005649717514
125, F1-score: 0.3568722930360138
```

```
Epoch 3/10 (Train): 100%|██████████| 1
18/118 [00:15<00:00, 7.68sample/s]
Epoch 3/10 (Eval): 100%|██████████| 1
71/71 [00:04<00:00, 15.74sample/s]
```

```
Epoch 3/10, Training Loss: 0.7000800598099552, Validation Loss: 2.2549235480653365
Accuracy: 0.5011299435028248, Precision: 0.5431969148541463, Recall: 0.5011299435028
248, F1-score: 0.35715882171718544
```

```
Epoch 4/10 (Train): 100%|██████████| 1
18/118 [00:15<00:00, 7.59sample/s]
Epoch 4/10 (Eval): 100%|██████████| 1
71/71 [00:04<00:00, 15.51sample/s]
```

Epoch 4/10, Training Loss: 0.697044515458998, Validation Loss: 1.058891467287042  
Accuracy: 0.5209039548022599, Precision: 0.5545367603053436, Recall: 0.5209039548022  
599, F1-score: 0.4243218774445893

Epoch 5/10 (Train): 100% | [██████████] | 1  
18/118 [00:15<00:00, 7.61sample/s]

Epoch 5/10 (Eval): 100% | [██████████] |  
71/71 [00:04<00:00, 15.52sample/s]

Epoch 5/10, Training Loss: 0.6990703446809674, Validation Loss: 20.206972150400407  
Accuracy: 0.5022598870056497, Precision: 0.25311852902829973, Recall: 0.502259887005  
6497, F1-score: 0.3366029028371823

Epoch 6/10 (Train): 100% | [██████████] | 1  
18/118 [00:15<00:00, 7.60sample/s]

Epoch 6/10 (Eval): 100% | [██████████] |  
71/71 [00:04<00:00, 15.07sample/s]

Epoch 6/10, Training Loss: 0.700176763008982, Validation Loss: 14.350255575399363  
Accuracy: 0.5107344632768361, Precision: 0.5370391324777831, Recall: 0.5107344632768  
361, F1-score: 0.38933855673204415

Epoch 7/10 (Train): 100% | [██████████] | 1  
18/118 [00:15<00:00, 7.64sample/s]

Epoch 7/10 (Eval): 100% | [██████████] |  
71/71 [00:04<00:00, 15.66sample/s]

Epoch 00007: reducing learning rate of group 0 to 1.0000e-04.

Epoch 7/10, Training Loss: 0.6992305333860427, Validation Loss: 2.6717621987148865  
Accuracy: 0.5096045197740113, Precision: 0.5272487961047896, Recall: 0.5096045197740  
113, F1-score: 0.3947212587037798

Epoch 8/10 (Train): 100% | [██████████] | 1  
18/118 [00:15<00:00, 7.63sample/s]

Epoch 8/10 (Eval): 100% | [██████████] |  
71/71 [00:04<00:00, 15.48sample/s]

Epoch 8/10, Training Loss: 0.6965601312242301, Validation Loss: 0.7069085142706747  
Accuracy: 0.5124293785310734, Precision: 0.5149462665543956, Recall: 0.5124293785310  
734, F1-score: 0.5005661476029494

Epoch 9/10 (Train): 100% | [██████████] | 1  
18/118 [00:15<00:00, 7.59sample/s]

Epoch 9/10 (Eval): 100% | [██████████] |  
71/71 [00:04<00:00, 15.54sample/s]

Epoch 9/10, Training Loss: 0.6960268164039555, Validation Loss: 0.7171243329842886  
Accuracy: 0.5288135593220339, Precision: 0.5288621741216176, Recall: 0.5288135593220  
34, F1-score: 0.5288135593220339

Epoch 10/10 (Train): 100% | [██████████] | 1  
18/118 [00:15<00:00, 7.59sample/s]

Epoch 10/10 (Eval): 100% | [██████████] |  
71/71 [00:04<00:00, 15.53sample/s]

Epoch 10/10, Training Loss: 0.6900323072444553, Validation Loss: 0.7092069380700925  
Accuracy: 0.5333333333333333, Precision: 0.5350467209736817, Recall: 0.5333333333333  
333, F1-score: 0.5297812019044704

Тренировка завершена!

Test: 100% | [██████████] |  
72/72 [00:04<00:00, 14.46sample/s]

```
Test Accuracy: 0.5289855072463768
Precision: 0.5293526332541593, Recall: 0.5289855072463768, F1-score: 0.5243059984204
036
Accuracy of cats : 42 %
Accuracy of dogs : 62 %
```

```
Class_name: cats
```

```
Train_count: 900
```

```
Test_count: 300
```

```
Valid_count: 300
```

```
Shutil images: 100%|██████████| 150
0/1500 [00:00<00:00, 1815.23image/s]
```

```
Class_name: dogs
```

```
Train_count: 900
```

```
Test_count: 300
```

```
Valid_count: 300
```

```
Shutil images: 100%|██████████| 150
0/1500 [00:00<00:00, 1792.26image/s]
```

---

```
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```

Выбранная модель: resnet101

Пользовательское название модели: resnet101\_Exp3

Выбранный оптимизатор: SGD

```
-----
```

```
Epoch 1/10 (Train): 100%|██████████| 1
18/118 [00:17<00:00, 6.81sample/s]
Epoch 1/10 (Eval): 100%|██████████| 1
71/71 [00:04<00:00, 15.26sample/s]
```

```
Epoch 1/10, Training Loss: 0.7403611362347111, Validation Loss: 2797172574.3728814
Accuracy: 0.5033898305084745, Precision: 0.25340132145935074, Recall: 0.503389830508
4745, F1-score: 0.3371066057745591
```

```
Epoch 2/10 (Train): 100%|██████████| 1
18/118 [00:17<00:00, 6.85sample/s]
Epoch 2/10 (Eval): 100%|██████████| 1
71/71 [00:04<00:00, 15.21sample/s]
```

```
Epoch 2/10, Training Loss: 0.728514591472571, Validation Loss: 69.67272373690781
Accuracy: 0.4966101694915254, Precision: 0.2466216604424016, Recall: 0.4966101694915
254, F1-score: 0.329573679866403
```

```
Epoch 3/10 (Train): 100%|██████████| 1
18/118 [00:17<00:00, 6.86sample/s]
Epoch 3/10 (Eval): 100%|██████████| 1
71/71 [00:04<00:00, 15.39sample/s]
```

```
Epoch 3/10, Training Loss: 0.7365824765973277, Validation Loss: 2.463010139405559
Accuracy: 0.5033898305084745, Precision: 0.25340132145935074, Recall: 0.503389830508
4745, F1-score: 0.3371066057745591
```

```
Epoch 4/10 (Train): 100%|██████████| 1
18/118 [00:17<00:00, 6.80sample/s]
Epoch 4/10 (Eval): 100%|██████████| 1
71/71 [00:04<00:00, 15.43sample/s]
```

Epoch 4/10, Training Loss: 0.731863917611025, Validation Loss: 0.9775800065132184  
Accuracy: 0.5033898305084745, Precision: 0.25340132145935074, Recall: 0.5033898305084745, F1-score: 0.3371066057745591

Epoch 5/10 (Train): 100% | 18/118 [00:17<00:00, 6.82sample/s]

Epoch 5/10 (Eval): 100% | 71/71 [00:04<00:00, 15.29sample/s]

Epoch 5/10, Training Loss: 0.7239620206458717, Validation Loss: 1.1334011510519657  
Accuracy: 0.5033898305084745, Precision: 0.25340132145935074, Recall: 0.5033898305084745, F1-score: 0.3371066057745591

Epoch 6/10 (Train): 100% | 18/118 [00:17<00:00, 6.85sample/s]

Epoch 6/10 (Eval): 100% | 71/71 [00:04<00:00, 15.23sample/s]

Epoch 6/10, Training Loss: 0.727608502664879, Validation Loss: 0.9504999216582816  
Accuracy: 0.4966101694915254, Precision: 0.2466216604424016, Recall: 0.4966101694915254, F1-score: 0.329573679866403

Epoch 7/10 (Train): 100% | 18/118 [00:17<00:00, 6.80sample/s]

Epoch 7/10 (Eval): 100% | 71/71 [00:04<00:00, 15.34sample/s]

Epoch 7/10, Training Loss: 0.7266404148820159, Validation Loss: 0.9539132508854408  
Accuracy: 0.5033898305084745, Precision: 0.25340132145935074, Recall: 0.5033898305084745, F1-score: 0.3371066057745591

Epoch 8/10 (Train): 100% | 18/118 [00:17<00:00, 6.84sample/s]

Epoch 8/10 (Eval): 100% | 71/71 [00:04<00:00, 15.30sample/s]

Epoch 8/10, Training Loss: 0.7197282513118491, Validation Loss: 0.866443762671476  
Accuracy: 0.4966101694915254, Precision: 0.2466216604424016, Recall: 0.4966101694915254, F1-score: 0.329573679866403

Epoch 9/10 (Train): 100% | 18/118 [00:17<00:00, 6.82sample/s]

Epoch 9/10 (Eval): 100% | 71/71 [00:04<00:00, 15.25sample/s]

Epoch 9/10, Training Loss: 0.7284031141032442, Validation Loss: 0.899925103800445  
Accuracy: 0.5033898305084745, Precision: 0.25340132145935074, Recall: 0.5033898305084745, F1-score: 0.3371066057745591

Epoch 10/10 (Train): 100% | 18/118 [00:17<00:00, 6.82sample/s]

Epoch 10/10 (Eval): 100% | 71/71 [00:04<00:00, 15.31sample/s]

Epoch 10/10, Training Loss: 0.7238442308472511, Validation Loss: 1.055055345308646  
Accuracy: 0.4966101694915254, Precision: 0.2466216604424016, Recall: 0.4966101694915254, F1-score: 0.329573679866403

Тренировка завершена!

Test: 100% | 72/72 [00:05<00:00, 14.20sample/s]

```
Test Accuracy: 0.5039018952062431
Precision: 0.25391711999244354, Recall: 0.5039018952062431, F1-score: 0.337677771138
95014
Accuracy of cats : 0 %
Accuracy of dogs : 100 %
```

```
Class_name: cats
```

```
Train_count: 900
```

```
Test_count: 300
```

```
Valid_count: 300
```

```
Shutil images: 100%|██████████| 150
0/1500 [00:00<00:00, 1793.87image/s]
```

```
Class_name: dogs
```

```
Train_count: 900
```

```
Test_count: 300
```

```
Valid_count: 300
```

```
Shutil images: 100%|██████████| 150
0/1500 [00:00<00:00, 1792.98image/s]
```

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```

Выбранная модель: resnet152

Пользовательское название модели: resnet152\_Exp3

Выбранный оптимизатор: SGD

```
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```

```
Epoch 1/10 (Train): 100%|██████████| 1
18/118 [00:23<00:00, 4.99sample/s]
Epoch 1/10 (Eval): 100%|██████████| 1
71/71 [00:05<00:00, 12.55sample/s]
```

```
Epoch 1/10, Training Loss: 0.7347267285977336, Validation Loss: 3802844246.779661
Accuracy: 0.4966101694915254, Precision: 0.2466216604424016, Recall: 0.4966101694915
254, F1-score: 0.329573679866403
```

```
Epoch 2/10 (Train): 100%|██████████| 1
18/118 [00:23<00:00, 5.04sample/s]
Epoch 2/10 (Eval): 100%|██████████| 1
71/71 [00:05<00:00, 12.42sample/s]
```

```
Epoch 2/10, Training Loss: 0.7342682596925018, Validation Loss: 1648879.3827683616
Accuracy: 0.5033898305084745, Precision: 0.25340132145935074, Recall: 0.503389830508
4745, F1-score: 0.3371066057745591
```

```
Epoch 3/10 (Train): 100%|██████████| 1
18/118 [00:23<00:00, 5.07sample/s]
Epoch 3/10 (Eval): 100%|██████████| 1
71/71 [00:05<00:00, 12.54sample/s]
```

```
Epoch 3/10, Training Loss: 0.7302612660482006, Validation Loss: 2.565646645965549
Accuracy: 0.5033898305084745, Precision: 0.25340132145935074, Recall: 0.503389830508
4745, F1-score: 0.3371066057745591
```

```
Epoch 4/10 (Train): 100%|██████████| 1
18/118 [00:23<00:00, 5.09sample/s]
Epoch 4/10 (Eval): 100%|██████████| 1
71/71 [00:05<00:00, 12.65sample/s]
```

Epoch 4/10, Training Loss: 0.7469322562462161, Validation Loss: 1.7374138375796842  
Accuracy: 0.4966101694915254, Precision: 0.2466216604424016, Recall: 0.4966101694915  
254, F1-score: 0.329573679866403

Epoch 5/10 (Train): 100% | [██████████] | 1  
18/118 [00:23<00:00, 5.02sample/s]

Epoch 5/10 (Eval): 100% | [██████████] |  
71/71 [00:05<00:00, 12.47sample/s]

Epoch 5/10, Training Loss: 0.7242831384695644, Validation Loss: 1.0865458573746143  
Accuracy: 0.5033898305084745, Precision: 0.25340132145935074, Recall: 0.503389830508  
4745, F1-score: 0.3371066057745591

Epoch 6/10 (Train): 100% | [██████████] | 1  
18/118 [00:23<00:00, 5.05sample/s]

Epoch 6/10 (Eval): 100% | [██████████] |  
71/71 [00:05<00:00, 12.60sample/s]

Epoch 6/10, Training Loss: 0.7308489550732621, Validation Loss: 2.2493374504275243  
Accuracy: 0.5033898305084745, Precision: 0.25340132145935074, Recall: 0.503389830508  
4745, F1-score: 0.3371066057745591

Epoch 7/10 (Train): 100% | [██████████] | 1  
18/118 [00:23<00:00, 5.04sample/s]

Epoch 7/10 (Eval): 100% | [██████████] |  
71/71 [00:05<00:00, 12.57sample/s]

Epoch 7/10, Training Loss: 0.7259784383636912, Validation Loss: 2.3641496965356468  
Accuracy: 0.4966101694915254, Precision: 0.2466216604424016, Recall: 0.4966101694915  
254, F1-score: 0.329573679866403

Epoch 8/10 (Train): 100% | [██████████] | 1  
18/118 [00:23<00:00, 5.04sample/s]

Epoch 8/10 (Eval): 100% | [██████████] |  
71/71 [00:05<00:00, 12.62sample/s]

Epoch 00008: reducing learning rate of group 0 to 1.0000e-04.

Epoch 8/10, Training Loss: 0.7221931339084328, Validation Loss: 1.5591469239548774  
Accuracy: 0.5033898305084745, Precision: 0.25340132145935074, Recall: 0.503389830508  
4745, F1-score: 0.3371066057745591

Epoch 9/10 (Train): 100% | [██████████] | 1  
18/118 [00:23<00:00, 5.05sample/s]

Epoch 9/10 (Eval): 100% | [██████████] |  
71/71 [00:05<00:00, 12.50sample/s]

Epoch 9/10, Training Loss: 0.7341880262794351, Validation Loss: 0.7055293872194776  
Accuracy: 0.5440677966101695, Precision: 0.5616921541927347, Recall: 0.5440677966101  
695, F1-score: 0.5130705344539567

Epoch 10/10 (Train): 100% | [██████████] | 1  
18/118 [00:23<00:00, 4.94sample/s]

Epoch 10/10 (Eval): 100% | [██████████] |  
71/71 [00:05<00:00, 12.80sample/s]

Epoch 10/10, Training Loss: 0.6996342498434788, Validation Loss: 0.6965520829804199  
Accuracy: 0.5497175141242938, Precision: 0.555773572713188, Recall: 0.54971751412429  
38, F1-score: 0.5395672397562057

Тренировка завершена!

Test: 100% | [██████████] |  
72/72 [00:05<00:00, 12.08sample/s]

```
Test Accuracy: 0.5641025641025641
Precision: 0.5692033749726058, Recall: 0.5641025641025641, F1-score: 0.5537633065190
074
Accuracy of cats : 41 %
Accuracy of dogs : 71 %
```

```
Class_name: cats
```

```
Train_count: 900
```

```
Test_count: 300
```

```
Valid_count: 300
```

```
Shutil images: 100%|██████████| 150
0/1500 [00:00<00:00, 1802.96image/s]
```

```
Class_name: dogs
```

```
Train_count: 900
```

```
Test_count: 300
```

```
Valid_count: 300
```

```
Shutil images: 100%|██████████| 150
0/1500 [00:00<00:00, 1794.48image/s]
```

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```

Выбранная модель: resnet18

Пользовательское название модели: resnet18\_Exp3

Выбранный оптимизатор: SGD

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```

```
Epoch 1/10 (Train): 100%|██████████| 1
18/118 [00:08<00:00, 14.72sample/s]
Epoch 1/10 (Eval): 100%|██████████| 1
71/71 [00:03<00:00, 22.71sample/s]
```

```
Epoch 1/10, Training Loss: 0.6998615747881686, Validation Loss: 0.6908786610021429
Accuracy: 0.5457627118644067, Precision: 0.5465001333655519, Recall: 0.5457627118644
067, F1-score: 0.544838383694739
```

```
Epoch 2/10 (Train): 100%|██████████| 1
18/118 [00:08<00:00, 14.55sample/s]
Epoch 2/10 (Eval): 100%|██████████| 1
71/71 [00:03<00:00, 22.64sample/s]
```

```
Epoch 2/10, Training Loss: 0.684514456429224, Validation Loss: 0.7076939367136713
Accuracy: 0.5242937853107345, Precision: 0.5533413971654197, Recall: 0.5242937853107
345, F1-score: 0.45696805886778524
```

```
Epoch 3/10 (Train): 100%|██████████| 1
18/118 [00:08<00:00, 14.45sample/s]
Epoch 3/10 (Eval): 100%|██████████| 1
71/71 [00:03<00:00, 22.82sample/s]
```

```
Epoch 3/10, Training Loss: 0.6778382600087135, Validation Loss: 0.6869916042028847
Accuracy: 0.5542372881355933, Precision: 0.558869635836385, Recall: 0.55423728813559
33, F1-score: 0.5471891054948738
```

```
Epoch 4/10 (Train): 100%|██████████| 1
18/118 [00:08<00:00, 14.53sample/s]
Epoch 4/10 (Eval): 100%|██████████| 1
71/71 [00:03<00:00, 22.93sample/s]
```

Epoch 4/10, Training Loss: 0.6736663238324291, Validation Loss: 0.7008834520807374  
Accuracy: 0.5468926553672316, Precision: 0.6054541471260715, Recall: 0.5468926553672  
316, F1-score: 0.47795885408821726

Epoch 5/10 (Train): 100% | ██████████ | 1  
18/118 [00:08<00:00, 14.65sample/s]  
Epoch 5/10 (Eval): 100% | ██████████ |  
71/71 [00:03<00:00, 22.91sample/s]

Epoch 5/10, Training Loss: 0.6640307813251336, Validation Loss: 0.6801366976930596  
Accuracy: 0.5627118644067797, Precision: 0.5899622465181577, Recall: 0.5627118644067  
797, F1-score: 0.5237166440843752

Epoch 6/10 (Train): 100% | ██████████ | 1  
18/118 [00:08<00:00, 14.49sample/s]  
Epoch 6/10 (Eval): 100% | ██████████ |  
71/71 [00:03<00:00, 23.04sample/s]

Epoch 6/10, Training Loss: 0.6608176312255925, Validation Loss: 0.6844681509807284  
Accuracy: 0.5632768361581921, Precision: 0.5927066831045659, Recall: 0.5632768361581  
921, F1-score: 0.5224582170611198

Epoch 7/10 (Train): 100% | ██████████ | 1  
18/118 [00:08<00:00, 14.54sample/s]  
Epoch 7/10 (Eval): 100% | ██████████ |  
71/71 [00:03<00:00, 23.42sample/s]

Epoch 7/10, Training Loss: 0.6519378571378313, Validation Loss: 0.6668678586092373  
Accuracy: 0.5903954802259888, Precision: 0.600640573371051, Recall: 0.59039548022598  
88, F1-score: 0.581017975670626

Epoch 8/10 (Train): 100% | ██████████ | 1  
18/118 [00:08<00:00, 14.42sample/s]  
Epoch 8/10 (Eval): 100% | ██████████ |  
71/71 [00:03<00:00, 22.59sample/s]

Epoch 8/10, Training Loss: 0.6559356966413054, Validation Loss: 0.6664398012861694  
Accuracy: 0.588135593220339, Precision: 0.6132074827405244, Recall: 0.58813559322033  
9, F1-score: 0.5658930128782244

Epoch 9/10 (Train): 100% | ██████████ | 1  
18/118 [00:08<00:00, 14.46sample/s]  
Epoch 9/10 (Eval): 100% | ██████████ |  
71/71 [00:03<00:00, 22.65sample/s]

Epoch 9/10, Training Loss: 0.6431404765916865, Validation Loss: 0.6686099445247381  
Accuracy: 0.5796610169491525, Precision: 0.6548867976580032, Recall: 0.5796610169491  
525, F1-score: 0.518964116065013

Epoch 10/10 (Train): 100% | ██████████ | 1  
18/118 [00:08<00:00, 14.61sample/s]  
Epoch 10/10 (Eval): 100% | ██████████ |  
71/71 [00:03<00:00, 23.30sample/s]

Epoch 10/10, Training Loss: 0.638582516902127, Validation Loss: 0.6676203994932821  
Accuracy: 0.5757062146892655, Precision: 0.6543959733020228, Recall: 0.5757062146892  
655, F1-score: 0.5110203602981009

Тренировка завершена!

Test: 100% | ██████████ |  
72/72 [00:04<00:00, 17.68sample/s]

```
Test Accuracy: 0.568561872909699
Precision: 0.6517324647981384, Recall: 0.568561872909699, F1-score: 0.50335419404578
02
Accuracy of cats : 93 %
Accuracy of dogs : 20 %
```

```
Class_name: cats
```

```
Train_count: 900
```

```
Test_count: 300
```

```
Valid_count: 300
```

```
Shutil images: 100%|██████████| 150
0/1500 [00:00<00:00, 1861.96image/s]
```

```
Class_name: dogs
```

```
Train_count: 900
```

```
Test_count: 300
```

```
Valid_count: 300
```

```
Shutil images: 100%|██████████| 150
0/1500 [00:00<00:00, 1874.23image/s]
```

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```

Выбранная модель: resnet34

Пользовательское название модели: resnet34\_Exp3

Выбранный оптимизатор: SGD

```
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```

```
Epoch 1/10 (Train): 100%|██████████| 1
18/118 [00:09<00:00, 12.39sample/s]
```

```
Epoch 1/10 (Eval): 100%|██████████| 1
71/71 [00:03<00:00, 21.73sample/s]
```

```
Epoch 1/10, Training Loss: 0.715479465783335, Validation Loss: 0.9583159476350256
Accuracy: 0.4937853107344633, Precision: 0.4802731817946118, Recall: 0.4937853107344
633, F1-score: 0.3593850237129132
```

```
Epoch 2/10 (Train): 100%|██████████| 1
18/118 [00:09<00:00, 12.45sample/s]
```

```
Epoch 2/10 (Eval): 100%|██████████| 1
71/71 [00:03<00:00, 21.67sample/s]
```

```
Epoch 2/10, Training Loss: 0.7067324788865371, Validation Loss: 0.7513302754884386
Accuracy: 0.5028248587570622, Precision: 0.49582861547190754, Recall: 0.50282485875
70622, F1-score: 0.3568053200176353
```

```
Epoch 3/10 (Train): 100%|██████████| 1
18/118 [00:09<00:00, 12.60sample/s]
```

```
Epoch 3/10 (Eval): 100%|██████████| 1
71/71 [00:03<00:00, 21.57sample/s]
```

```
Epoch 3/10, Training Loss: 0.6962287612182998, Validation Loss: 0.7303530716963407
Accuracy: 0.5016949152542373, Precision: 0.4965967293366082, Recall: 0.501694915254
2373, F1-score: 0.3992217635155219
```

```
Epoch 4/10 (Train): 100%|██████████| 1
18/118 [00:09<00:00, 12.51sample/s]
```

```
Epoch 4/10 (Eval): 100%|██████████| 1
71/71 [00:03<00:00, 21.59sample/s]
```

Epoch 4/10, Training Loss: 0.6885352596508177, Validation Loss: 0.7007587991528592  
Accuracy: 0.5231638418079096, Precision: 0.5289986842951943, Recall: 0.5231638418079096, F1-score: 0.4895259424205731

Epoch 5/10 (Train): 100% | ██████████ | 1

18/118 [00:09<00:00, 12.63sample/s]

Epoch 5/10 (Eval): 100% | ██████████ |

71/71 [00:03<00:00, 21.30sample/s]

Epoch 5/10, Training Loss: 0.6924093031793609, Validation Loss: 0.7114451790260057

Accuracy: 0.5180790960451978, Precision: 0.5453208616715839, Recall: 0.5180790960451978, F1-score: 0.4218927633452

Epoch 6/10 (Train): 100% | ██████████ | 1

18/118 [00:09<00:00, 12.60sample/s]

Epoch 6/10 (Eval): 100% | ██████████ |

71/71 [00:03<00:00, 21.71sample/s]

Epoch 6/10, Training Loss: 0.6826922334144968, Validation Loss: 0.6954802927997826

Accuracy: 0.5457627118644067, Precision: 0.5648791314059657, Recall: 0.5457627118644067, F1-score: 0.5052560488938471

Epoch 7/10 (Train): 100% | ██████████ | 1

18/118 [00:09<00:00, 12.39sample/s]

Epoch 7/10 (Eval): 100% | ██████████ |

71/71 [00:03<00:00, 21.63sample/s]

Epoch 7/10, Training Loss: 0.6811630329854343, Validation Loss: 0.774952118090317

Accuracy: 0.5192090395480226, Precision: 0.562884478676785, Recall: 0.5192090395480226, F1-score: 0.4263882353556864

Epoch 8/10 (Train): 100% | ██████████ | 1

18/118 [00:09<00:00, 12.55sample/s]

Epoch 8/10 (Eval): 100% | ██████████ |

71/71 [00:03<00:00, 21.85sample/s]

Epoch 8/10, Training Loss: 0.6746122280131931, Validation Loss: 0.6812387600456927

Accuracy: 0.5598870056497175, Precision: 0.563900437053619, Recall: 0.5598870056497175, F1-score: 0.5509975946747218

Epoch 9/10 (Train): 100% | ██████████ | 1

18/118 [00:09<00:00, 12.57sample/s]

Epoch 9/10 (Eval): 100% | ██████████ |

71/71 [00:03<00:00, 21.57sample/s]

Epoch 9/10, Training Loss: 0.6738577286062873, Validation Loss: 0.695301428942357

Accuracy: 0.5423728813559322, Precision: 0.5785384829119199, Recall: 0.5423728813559322, F1-score: 0.48746527974604614

Epoch 10/10 (Train): 100% | ██████████ | 1

18/118 [00:09<00:00, 12.53sample/s]

Epoch 10/10 (Eval): 100% | ██████████ |

71/71 [00:03<00:00, 21.56sample/s]

Epoch 10/10, Training Loss: 0.6563119514503466, Validation Loss: 0.7162131875921778

Accuracy: 0.5248587570621469, Precision: 0.5903678457381479, Recall: 0.5248587570621469, F1-score: 0.4131912065056702

Тренировка завершена!

Test: 100% | ██████████ |

72/72 [00:03<00:00, 18.11sample/s]

```
Test Accuracy: 0.5133779264214047
Precision: 0.5754947395039048, Recall: 0.5133779264214047, F1-score: 0.3968187918267
438
Accuracy of cats : 95 %
Accuracy of dogs : 7 %
```

```
Class_name: cats
```

```
Train_count: 900
```

```
Test_count: 300
```

```
Valid_count: 300
```

```
Shutil images: 100%|██████████| 150
0/1500 [00:00<00:00, 1780.92image/s]
```

```
Class_name: dogs
```

```
Train_count: 900
```

```
Test_count: 300
```

```
Valid_count: 300
```

```
Shutil images: 100%|██████████| 150
0/1500 [00:00<00:00, 1807.53image/s]
```

---

```
Выбранная модель: resnet50
```

```
Пользовательское название модели: resnet50_Exp3
```

```
Выбранный оптимизатор: SGD
```

---

```
Epoch 1/10 (Train): 100%|██████████| 1
18/118 [00:11<00:00, 10.51sample/s]
Epoch 1/10 (Eval): 100%|██████████| 1
71/71 [00:03<00:00, 19.96sample/s]
```

```
Epoch 1/10, Training Loss: 0.7465245577870211, Validation Loss: 333.05983453955355
Accuracy: 0.5033898305084745, Precision: 0.25340132145935074, Recall: 0.503389830508
4745, F1-score: 0.3371066057745591
```

```
Epoch 2/10 (Train): 100%|██████████| 1
18/118 [00:11<00:00, 10.68sample/s]
Epoch 2/10 (Eval): 100%|██████████| 1
71/71 [00:03<00:00, 20.02sample/s]
```

```
Epoch 2/10, Training Loss: 0.733287570599571, Validation Loss: 4.188845433974849
Accuracy: 0.4966101694915254, Precision: 0.2466216604424016, Recall: 0.4966101694915
254, F1-score: 0.329573679866403
```

```
Epoch 3/10 (Train): 100%|██████████| 1
18/118 [00:11<00:00, 10.64sample/s]
Epoch 3/10 (Eval): 100%|██████████| 1
71/71 [00:03<00:00, 19.98sample/s]
```

```
Epoch 3/10, Training Loss: 0.7373235471755449, Validation Loss: 51.96482477080573
Accuracy: 0.4966101694915254, Precision: 0.2466216604424016, Recall: 0.4966101694915
254, F1-score: 0.329573679866403
```

```
Epoch 4/10 (Train): 100%|██████████| 1
18/118 [00:11<00:00, 10.62sample/s]
Epoch 4/10 (Eval): 100%|██████████| 1
71/71 [00:03<00:00, 19.48sample/s]
```

Epoch 4/10, Training Loss: 0.7461495975558268, Validation Loss: 42.466906851013114  
Accuracy: 0.5033898305084745, Precision: 0.25340132145935074, Recall: 0.5033898305084745, F1-score: 0.3371066057745591

Epoch 5/10 (Train): 100% | ██████████ | 1  
18/118 [00:11<00:00, 10.40sample/s]  
Epoch 5/10 (Eval): 100% | ██████████ |  
71/71 [00:03<00:00, 19.60sample/s]

Epoch 00005: reducing learning rate of group 0 to 1.0000e-04.

Epoch 5/10, Training Loss: 0.7293078623666229, Validation Loss: 5.554686370584587  
Accuracy: 0.5033898305084745, Precision: 0.25340132145935074, Recall: 0.5033898305084745, F1-score: 0.3371066057745591

Epoch 6/10 (Train): 100% | ██████████ | 1  
18/118 [00:11<00:00, 10.57sample/s]  
Epoch 6/10 (Eval): 100% | ██████████ |  
71/71 [00:03<00:00, 19.83sample/s]

Epoch 6/10, Training Loss: 0.7338661019189343, Validation Loss: 0.7218633167824503  
Accuracy: 0.5045197740112994, Precision: 0.5130081321410813, Recall: 0.5045197740112994, F1-score: 0.43866076244576685

Epoch 7/10 (Train): 100% | ██████████ | 1  
18/118 [00:11<00:00, 10.59sample/s]  
Epoch 7/10 (Eval): 100% | ██████████ |  
71/71 [00:03<00:00, 19.53sample/s]

Epoch 7/10, Training Loss: 0.7078901782316128, Validation Loss: 0.7132346771531186  
Accuracy: 0.49491525423728816, Precision: 0.49551943336136334, Recall: 0.49491525423728816, F1-score: 0.46453212295957236

Epoch 8/10 (Train): 100% | ██████████ | 1  
18/118 [00:11<00:00, 10.66sample/s]  
Epoch 8/10 (Eval): 100% | ██████████ |  
71/71 [00:03<00:00, 19.77sample/s]

Epoch 8/10, Training Loss: 0.7036881918012484, Validation Loss: 0.7096885435998777  
Accuracy: 0.5225988700564972, Precision: 0.5283729584793633, Recall: 0.5225988700564972, F1-score: 0.5035489979265765

Epoch 9/10 (Train): 100% | ██████████ | 1  
18/118 [00:11<00:00, 10.57sample/s]  
Epoch 9/10 (Eval): 100% | ██████████ |  
71/71 [00:03<00:00, 19.82sample/s]

Epoch 9/10, Training Loss: 0.7067849141070065, Validation Loss: 0.7137499729455528  
Accuracy: 0.5028248587570622, Precision: 0.5065536486473078, Recall: 0.5028248587570622, F1-score: 0.4644960404652702

Epoch 10/10 (Train): 100% | ██████████ | 1  
18/118 [00:11<00:00, 10.62sample/s]  
Epoch 10/10 (Eval): 100% | ██████████ |  
71/71 [00:03<00:00, 19.86sample/s]

Epoch 10/10, Training Loss: 0.7032202619929389, Validation Loss: 0.7152102784921894  
Accuracy: 0.503954802259887, Precision: 0.5030352127631037, Recall: 0.503954802259887, F1-score: 0.4468752351845579

Тренировка завершена!

Test: 100% | ██████████ |  
72/72 [00:04<00:00, 17.36sample/s]

```
Test Accuracy: 0.4944258639910814
Precision: 0.49477168491729007, Recall: 0.4944258639910814, F1-score: 0.436038452686
00755
Accuracy of cats : 81 %
Accuracy of dogs : 17 %
```

```
Class_name: cats
```

```
Train_count: 900
```

```
Test_count: 300
```

```
Valid_count: 300
```

```
Shutil images: 100%|██████████| 150
0/1500 [00:00<00:00, 1793.40image/s]
```

```
Class_name: dogs
```

```
Train_count: 900
```

```
Test_count: 300
```

```
Valid_count: 300
```

```
Shutil images: 100%|██████████| 150
0/1500 [00:00<00:00, 1799.56image/s]
```

---

```
-----
```

Выбранная модель: resnext101\_64x4d

Пользовательское название модели: resnext101\_64x4d\_Exp3

Выбранный оптимизатор: SGD

---

```
Epoch 1/10 (Train): 100%|██████████| 1
18/118 [00:24<00:00, 4.88sample/s]
Epoch 1/10 (Eval): 100%|██████████| 1
71/71 [00:05<00:00, 12.34sample/s]
```

```
Epoch 1/10, Training Loss: 0.7525832757954718, Validation Loss: 2551716.066384181
Accuracy: 0.4966101694915254, Precision: 0.2466216604424016, Recall: 0.4966101694915
254, F1-score: 0.329573679866403
```

```
Epoch 2/10 (Train): 100%|██████████| 1
18/118 [00:23<00:00, 5.01sample/s]
Epoch 2/10 (Eval): 100%|██████████| 1
71/71 [00:05<00:00, 12.40sample/s]
```

```
Epoch 2/10, Training Loss: 0.7378329703519382, Validation Loss: 2528.501655880341
Accuracy: 0.4966101694915254, Precision: 0.2466216604424016, Recall: 0.4966101694915
254, F1-score: 0.329573679866403
```

```
Epoch 3/10 (Train): 100%|██████████| 1
18/118 [00:23<00:00, 4.97sample/s]
Epoch 3/10 (Eval): 100%|██████████| 1
71/71 [00:05<00:00, 12.37sample/s]
```

```
Epoch 3/10, Training Loss: 0.7380246431429909, Validation Loss: 245.16204705372044
Accuracy: 0.4966101694915254, Precision: 0.2466216604424016, Recall: 0.4966101694915
254, F1-score: 0.329573679866403
```

```
Epoch 4/10 (Train): 100%|██████████| 1
18/118 [00:23<00:00, 4.98sample/s]
Epoch 4/10 (Eval): 100%|██████████| 1
71/71 [00:05<00:00, 12.47sample/s]
```

```
Epoch 4/10, Training Loss: 0.7411700479192271, Validation Loss: 1.4338667079553766
Accuracy: 0.4966101694915254, Precision: 0.2466216604424016, Recall: 0.4966101694915
254, F1-score: 0.329573679866403
Epoch 5/10 (Train): 100%|██████████| 1
18/118 [00:23<00:00, 5.00sample/s]
Epoch 5/10 (Eval): 100%|██████████| 1
71/71 [00:05<00:00, 12.16sample/s]
Epoch 5/10, Training Loss: 0.7216403984852384, Validation Loss: 1.4921670048839628
Accuracy: 0.4966101694915254, Precision: 0.2466216604424016, Recall: 0.4966101694915
254, F1-score: 0.329573679866403
Epoch 6/10 (Train): 100%|██████████| 1
18/118 [00:23<00:00, 4.94sample/s]
Epoch 6/10 (Eval): 100%|██████████| 1
71/71 [00:05<00:00, 12.25sample/s]
Epoch 6/10, Training Loss: 0.7316995968333028, Validation Loss: 4.351535974628171
Accuracy: 0.4966101694915254, Precision: 0.2466216604424016, Recall: 0.4966101694915
254, F1-score: 0.329573679866403
Epoch 7/10 (Train): 100%|██████████| 1
18/118 [00:23<00:00, 4.96sample/s]
Epoch 7/10 (Eval): 100%|██████████| 1
71/71 [00:05<00:00, 12.47sample/s]
Epoch 00007: reducing learning rate of group 0 to 1.0000e-04.

Epoch 7/10, Training Loss: 0.7275608374252762, Validation Loss: 1.443393467509814
Accuracy: 0.4966101694915254, Precision: 0.2466216604424016, Recall: 0.4966101694915
254, F1-score: 0.329573679866403
Epoch 8/10 (Train): 100%|██████████| 1
18/118 [00:23<00:00, 4.96sample/s]
Epoch 8/10 (Eval): 100%|██████████| 1
71/71 [00:05<00:00, 12.24sample/s]
Epoch 8/10, Training Loss: 0.7204732645356484, Validation Loss: 0.6913365393371905
Accuracy: 0.5265536723163842, Precision: 0.5266171302521137, Recall: 0.5265536723163
842, F1-score: 0.5240689083639756
Epoch 9/10 (Train): 100%|██████████| 1
18/118 [00:23<00:00, 4.98sample/s]
Epoch 9/10 (Eval): 100%|██████████| 1
71/71 [00:05<00:00, 12.09sample/s]
Epoch 9/10, Training Loss: 0.6913572142406107, Validation Loss: 0.7007685512472681
Accuracy: 0.5248587570621469, Precision: 0.5303384507395518, Recall: 0.5248587570621
469, F1-score: 0.508095840741171
Epoch 10/10 (Train): 100%|██████████| 1
18/118 [00:23<00:00, 4.96sample/s]
Epoch 10/10 (Eval): 100%|██████████| 1
71/71 [00:05<00:00, 12.25sample/s]
Epoch 10/10, Training Loss: 0.6918840687403676, Validation Loss: 0.6969541132786853
Accuracy: 0.5124293785310734, Precision: 0.5138740603068046, Recall: 0.5124293785310
734, F1-score: 0.4840247832309685
Тренировка завершена!
Test: 100%|██████████| 1
72/72 [00:06<00:00, 11.68sample/s]
```

```
Test Accuracy: 0.5379041248606466
Precision: 0.5515564576107098, Recall: 0.5379041248606466, F1-score: 0.5103523298184
883
Accuracy of cats : 77 %
Accuracy of dogs : 30 %
```

```
Class_name: cats
```

```
Train_count: 900
```

```
Test_count: 300
```

```
Valid_count: 300
```

```
Shutil images: 100%|██████████| 150
0/1500 [00:00<00:00, 1753.34image/s]
```

```
Class_name: dogs
```

```
Train_count: 900
```

```
Test_count: 300
```

```
Valid_count: 300
```

```
Shutil images: 100%|██████████| 150
0/1500 [00:00<00:00, 1756.54image/s]
```

---

```
-----
```

Выбранная модель: resnext50\_32x4d

Пользовательское название модели: resnext50\_32x4d\_Exp3

Выбранный оптимизатор: SGD

---

```
Epoch 1/10 (Train): 100%|██████████| 1
18/118 [00:12<00:00, 9.60sample/s]
Epoch 1/10 (Eval): 100%|██████████| 1
71/71 [00:03<00:00, 19.12sample/s]
```

```
Epoch 1/10, Training Loss: 0.7278767473593365, Validation Loss: 277.2474249715859
Accuracy: 0.5033898305084745, Precision: 0.25340132145935074, Recall: 0.503389830508
4745, F1-score: 0.3371066057745591
```

```
Epoch 2/10 (Train): 100%|██████████| 1
18/118 [00:12<00:00, 9.62sample/s]
Epoch 2/10 (Eval): 100%|██████████| 1
71/71 [00:03<00:00, 19.06sample/s]
```

```
Epoch 2/10, Training Loss: 0.7368057032439779, Validation Loss: 127.2274599236957
Accuracy: 0.4966101694915254, Precision: 0.2466216604424016, Recall: 0.4966101694915
254, F1-score: 0.329573679866403
```

```
Epoch 3/10 (Train): 100%|██████████| 1
18/118 [00:12<00:00, 9.64sample/s]
Epoch 3/10 (Eval): 100%|██████████| 1
71/71 [00:03<00:00, 19.20sample/s]
```

```
Epoch 3/10, Training Loss: 0.728734463840336, Validation Loss: 32.58077715507227
Accuracy: 0.4966101694915254, Precision: 0.2466216604424016, Recall: 0.4966101694915
254, F1-score: 0.329573679866403
```

```
Epoch 4/10 (Train): 100%|██████████| 1
18/118 [00:12<00:00, 9.64sample/s]
Epoch 4/10 (Eval): 100%|██████████| 1
71/71 [00:03<00:00, 18.99sample/s]
```

Epoch 4/10, Training Loss: 0.7401756029461478, Validation Loss: 15.218810721011518  
Accuracy: 0.4966101694915254, Precision: 0.2466216604424016, Recall: 0.4966101694915  
254, F1-score: 0.329573679866403

Epoch 5/10 (Train): 100% | ██████████ | 1  
18/118 [00:12<00:00, 9.59sample/s]  
Epoch 5/10 (Eval): 100% | ██████████ |  
71/71 [00:03<00:00, 19.08sample/s]

Epoch 5/10, Training Loss: 0.7315976783093409, Validation Loss: 33.85943356737221  
Accuracy: 0.4966101694915254, Precision: 0.2466216604424016, Recall: 0.4966101694915  
254, F1-score: 0.329573679866403

Epoch 6/10 (Train): 100% | ██████████ | 1  
18/118 [00:12<00:00, 9.69sample/s]  
Epoch 6/10 (Eval): 100% | ██████████ |  
71/71 [00:03<00:00, 18.96sample/s]

Epoch 6/10, Training Loss: 0.7291170672977615, Validation Loss: 6.690927338568062  
Accuracy: 0.4966101694915254, Precision: 0.2466216604424016, Recall: 0.4966101694915  
254, F1-score: 0.329573679866403

Epoch 7/10 (Train): 100% | ██████████ | 1  
18/118 [00:12<00:00, 9.71sample/s]  
Epoch 7/10 (Eval): 100% | ██████████ |  
71/71 [00:03<00:00, 19.04sample/s]

Epoch 7/10, Training Loss: 0.7237424132193268, Validation Loss: 3.025086563333111  
Accuracy: 0.4966101694915254, Precision: 0.2466216604424016, Recall: 0.4966101694915  
254, F1-score: 0.329573679866403

Epoch 8/10 (Train): 100% | ██████████ | 1  
18/118 [00:12<00:00, 9.68sample/s]  
Epoch 8/10 (Eval): 100% | ██████████ |  
71/71 [00:03<00:00, 19.25sample/s]

Epoch 8/10, Training Loss: 0.7241785890911021, Validation Loss: 11.658465178258517  
Accuracy: 0.4966101694915254, Precision: 0.2466216604424016, Recall: 0.4966101694915  
254, F1-score: 0.329573679866403

Epoch 9/10 (Train): 100% | ██████████ | 1  
18/118 [00:12<00:00, 9.77sample/s]  
Epoch 9/10 (Eval): 100% | ██████████ |  
71/71 [00:03<00:00, 19.21sample/s]

Epoch 9/10, Training Loss: 0.734132651629223, Validation Loss: 6.665991349587753  
Accuracy: 0.5033898305084745, Precision: 0.25340132145935074, Recall: 0.503389830508  
4745, F1-score: 0.3371066057745591

Epoch 10/10 (Train): 100% | ██████████ | 1  
18/118 [00:12<00:00, 9.74sample/s]  
Epoch 10/10 (Eval): 100% | ██████████ |  
71/71 [00:03<00:00, 19.11sample/s]

Epoch 00010: reducing learning rate of group 0 to 1.0000e-04.

Epoch 10/10, Training Loss: 0.728002811203407, Validation Loss: 6.899737000929739  
Accuracy: 0.5033898305084745, Precision: 0.25340132145935074, Recall: 0.503389830508  
4745, F1-score: 0.3371066057745591

Тренировка завершена!

Test: 100% | ██████████ |  
72/72 [00:04<00:00, 16.72sample/s]

```
Test Accuracy: 0.496098104793757
Precision: 0.2461133295799575, Recall: 0.496098104793757, F1-score: 0.32900693984086
715
Accuracy of cats : 100 %
Accuracy of dogs : 0 %
```

```
Class_name: cats
```

```
Train_count: 900
```

```
Test_count: 300
```

```
Valid_count: 300
```

```
Shutil images: 100%|██████████| 150
0/1500 [00:00<00:00, 1791.01image/s]
```

```
Class_name: dogs
```

```
Train_count: 900
```

```
Test_count: 300
```

```
Valid_count: 300
```

```
Shutil images: 100%|██████████| 150
0/1500 [00:00<00:00, 1803.39image/s]
```

---

```
Выбранная модель: shufflenet_v2_x0_5
```

```
Пользовательское название модели: shufflenet_v2_x0_5_Exp3
```

```
Выбранный оптимизатор: AdamW
```

---

```
Epoch 1/10 (Train): 100%|██████████| 1
18/118 [00:13<00:00, 8.91sample/s]
```

```
Epoch 1/10 (Eval): 100%|██████████| 1
71/71 [00:03<00:00, 20.62sample/s]
```

```
Epoch 1/10, Training Loss: 0.7366899135824921, Validation Loss: 0.7295490292000906
Accuracy: 0.5084745762711864, Precision: 0.5175109206283638, Recall: 0.5084745762711
864, F1-score: 0.4080626811511633
```

```
Epoch 2/10 (Train): 100%|██████████| 1
18/118 [00:13<00:00, 8.98sample/s]
```

```
Epoch 2/10 (Eval): 100%|██████████| 1
71/71 [00:03<00:00, 21.33sample/s]
```

```
Epoch 2/10, Training Loss: 0.7172180818761772, Validation Loss: 0.7438432384850615
Accuracy: 0.5135593220338983, Precision: 0.5617638492052484, Recall: 0.5135593220338
983, F1-score: 0.3854099144572552
```

```
Epoch 3/10 (Train): 100%|██████████| 1
18/118 [00:13<00:00, 8.57sample/s]
```

```
Epoch 3/10 (Eval): 100%|██████████| 1
71/71 [00:03<00:00, 21.18sample/s]
```

```
Epoch 3/10, Training Loss: 0.7156953329674935, Validation Loss: 0.6972340852190546
Accuracy: 0.5084745762711864, Precision: 0.5082179990321389, Recall: 0.5084745762711
864, F1-score: 0.4963992553359728
```

```
Epoch 4/10 (Train): 100%|██████████| 1
18/118 [00:12<00:00, 9.10sample/s]
```

```
Epoch 4/10 (Eval): 100%|██████████| 1
71/71 [00:03<00:00, 21.33sample/s]
```

Epoch 4/10, Training Loss: 0.689063129731424, Validation Loss: 0.6998073446043467  
Accuracy: 0.5254237288135594, Precision: 0.5696389966575016, Recall: 0.5254237288135  
594, F1-score: 0.42847431283560594

Epoch 5/10 (Train): 100% | ██████████ | 1  
18/118 [00:13<00:00, 8.94sample/s]  
Epoch 5/10 (Eval): 100% | ██████████ |  
71/71 [00:03<00:00, 21.70sample/s]

Epoch 5/10, Training Loss: 0.6959170303928143, Validation Loss: 0.6827906028362317  
Accuracy: 0.5598870056497175, Precision: 0.5601756096894913, Recall: 0.5598870056497  
175, F1-score: 0.5586732454646133

Epoch 6/10 (Train): 100% | ██████████ | 1  
18/118 [00:13<00:00, 8.93sample/s]  
Epoch 6/10 (Eval): 100% | ██████████ |  
71/71 [00:03<00:00, 22.02sample/s]

Epoch 6/10, Training Loss: 0.6876586054134108, Validation Loss: 0.6808339680655527  
Accuracy: 0.5615819209039548, Precision: 0.5829890881306199, Recall: 0.5615819209039  
548, F1-score: 0.5282646546179286

Epoch 7/10 (Train): 100% | ██████████ | 1  
18/118 [00:12<00:00, 9.16sample/s]  
Epoch 7/10 (Eval): 100% | ██████████ |  
71/71 [00:03<00:00, 21.20sample/s]

Epoch 7/10, Training Loss: 0.6822257993446176, Validation Loss: 0.6697666055738589  
Accuracy: 0.5875706214689266, Precision: 0.5893099296947901, Recall: 0.5875706214689  
266, F1-score: 0.5848258657668969

Epoch 8/10 (Train): 100% | ██████████ | 1  
18/118 [00:12<00:00, 9.11sample/s]  
Epoch 8/10 (Eval): 100% | ██████████ |  
71/71 [00:03<00:00, 21.41sample/s]

Epoch 8/10, Training Loss: 0.6817863535082511, Validation Loss: 0.6740937271697373  
Accuracy: 0.5813559322033899, Precision: 0.6075365985998159, Recall: 0.5813559322033  
899, F1-score: 0.5519623585793617

Epoch 9/10 (Train): 100% | ██████████ | 1  
18/118 [00:13<00:00, 8.90sample/s]  
Epoch 9/10 (Eval): 100% | ██████████ |  
71/71 [00:03<00:00, 21.21sample/s]

Epoch 9/10, Training Loss: 0.6660352242538885, Validation Loss: 0.6661441088733027  
Accuracy: 0.5875706214689266, Precision: 0.5973006013551285, Recall: 0.5875706214689  
266, F1-score: 0.578345777334921

Epoch 10/10 (Train): 100% | ██████████ | 1  
18/118 [00:13<00:00, 8.89sample/s]  
Epoch 10/10 (Eval): 100% | ██████████ |  
71/71 [00:03<00:00, 20.88sample/s]

Epoch 10/10, Training Loss: 0.657773833837073, Validation Loss: 0.6722947061903732  
Accuracy: 0.596045197740113, Precision: 0.6667450777227698, Recall: 0.59604519774011  
3, F1-score: 0.5460044930762744

Тренировка завершена!

Test: 100% | ██████████ |  
72/72 [00:03<00:00, 19.10sample/s]

```
Test Accuracy: 0.5886287625418061
Precision: 0.6562785608291773, Recall: 0.5886287625418061, F1-score: 0.5413035322612
484
Accuracy of cats : 91 %
Accuracy of dogs : 26 %
```

```
Class_name: cats
```

```
Train_count: 900
```

```
Test_count: 300
```

```
Valid_count: 300
```

```
Shutil images: 100%|██████████| 150
0/1500 [00:00<00:00, 1861.41image/s]
```

```
Class_name: dogs
```

```
Train_count: 900
```

```
Test_count: 300
```

```
Valid_count: 300
```

```
Shutil images: 100%|██████████| 150
0/1500 [00:00<00:00, 1805.81image/s]
```

---

```
Выбранная модель: shufflenet_v2_x1_0
```

```
Пользовательское название модели: shufflenet_v2_x1_0_Exp3
```

```
Выбранный оптимизатор: AdamW
```

---

```
Epoch 1/10 (Train): 100%|██████████| 1
18/118 [00:12<00:00, 9.19sample/s]
```

```
Epoch 1/10 (Eval): 100%|██████████| 1
71/71 [00:03<00:00, 21.70sample/s]
```

```
Epoch 1/10, Training Loss: 0.7489076540821314, Validation Loss: 0.720770964346363
Accuracy: 0.5067796610169492, Precision: 0.5621015252940821, Recall: 0.5067796610169492, F1-score: 0.37623642699348003
```

```
Epoch 2/10 (Train): 100%|██████████| 1
18/118 [00:13<00:00, 8.75sample/s]
```

```
Epoch 2/10 (Eval): 100%|██████████| 1
71/71 [00:03<00:00, 21.07sample/s]
```

```
Epoch 2/10, Training Loss: 0.6927572245151313, Validation Loss: 0.6989079728133261
Accuracy: 0.5378531073446328, Precision: 0.6978736531234752, Recall: 0.5378531073446328, F1-score: 0.417244859414006
```

```
Epoch 3/10 (Train): 100%|██████████| 1
18/118 [00:13<00:00, 8.63sample/s]
```

```
Epoch 3/10 (Eval): 100%|██████████| 1
71/71 [00:03<00:00, 21.01sample/s]
```

```
Epoch 3/10, Training Loss: 0.6707042255633022, Validation Loss: 0.6921959343434727
Accuracy: 0.5225988700564972, Precision: 0.7288524453381074, Recall: 0.5225988700564972, F1-score: 0.38021498353675365
```

```
Epoch 4/10 (Train): 100%|██████████| 1
18/118 [00:13<00:00, 8.70sample/s]
```

```
Epoch 4/10 (Eval): 100%|██████████| 1
71/71 [00:03<00:00, 21.24sample/s]
```

Epoch 4/10, Training Loss: 0.6412140945213263, Validation Loss: 0.6109038350609063  
Accuracy: 0.6621468926553672, Precision: 0.6939193330401308, Recall: 0.6621468926553  
672, F1-score: 0.6485845358944812

Epoch 5/10 (Train): 100% | [██████████] | 1  
18/118 [00:13<00:00, 8.51sample/s]

Epoch 5/10 (Eval): 100% | [██████████] |  
71/71 [00:03<00:00, 21.21sample/s]

Epoch 5/10, Training Loss: 0.5958284138410938, Validation Loss: 0.6235372152200527  
Accuracy: 0.6384180790960452, Precision: 0.7211736862842228, Recall: 0.6384180790960  
452, F1-score: 0.5996876773612352

Epoch 6/10 (Train): 100% | [██████████] | 1  
18/118 [00:13<00:00, 8.63sample/s]

Epoch 6/10 (Eval): 100% | [██████████] |  
71/71 [00:03<00:00, 21.11sample/s]

Epoch 6/10, Training Loss: 0.5862367821631982, Validation Loss: 0.5813650227030792  
Accuracy: 0.7, Precision: 0.7186682639512829, Recall: 0.7, F1-score: 0.6939523743994  
098

Epoch 7/10 (Train): 100% | [██████████] | 1  
18/118 [00:13<00:00, 8.72sample/s]

Epoch 7/10 (Eval): 100% | [██████████] |  
71/71 [00:03<00:00, 21.20sample/s]

Epoch 7/10, Training Loss: 0.5711074072717398, Validation Loss: 0.529723634490859  
Accuracy: 0.7564971751412429, Precision: 0.7597943173411591, Recall: 0.7564971751412  
429, F1-score: 0.7558548560290639

Epoch 8/10 (Train): 100% | [██████████] | 1  
18/118 [00:13<00:00, 8.69sample/s]

Epoch 8/10 (Eval): 100% | [██████████] |  
71/71 [00:03<00:00, 20.89sample/s]

Epoch 8/10, Training Loss: 0.5544239301654629, Validation Loss: 0.5057156123010452  
Accuracy: 0.7610169491525424, Precision: 0.7664530408773679, Recall: 0.7610169491525  
424, F1-score: 0.7596205995922395

Epoch 9/10 (Train): 100% | [██████████] | 1  
18/118 [00:13<00:00, 8.64sample/s]

Epoch 9/10 (Eval): 100% | [██████████] |  
71/71 [00:03<00:00, 21.11sample/s]

Epoch 9/10, Training Loss: 0.516968219596396, Validation Loss: 0.4758077704973814  
Accuracy: 0.7717514124293785, Precision: 0.7788996335453857, Recall: 0.7717514124293  
785, F1-score: 0.7701019767828272

Epoch 10/10 (Train): 100% | [██████████] | 1  
18/118 [00:13<00:00, 8.69sample/s]

Epoch 10/10 (Eval): 100% | [██████████] |  
71/71 [00:03<00:00, 21.23sample/s]

Epoch 10/10, Training Loss: 0.4964944348095707, Validation Loss: 0.4772176186075318  
Accuracy: 0.7824858757062146, Precision: 0.7826385092967483, Recall: 0.7824858757062  
146, F1-score: 0.7824299634962771

Тренировка завершена!

Test: 100% | [██████████] |  
72/72 [00:03<00:00, 18.55sample/s]

```
Test Accuracy: 0.7697881828316611
Precision: 0.76981882776045, Recall: 0.7697881828316611, F1-score: 0.769763070430865
8
Accuracy of cats : 76 %
Accuracy of dogs : 77 %
```

```
Class_name: cats
```

```
Train_count: 900
```

```
Test_count: 300
```

```
Valid_count: 300
```

```
Shutil images: 100%|██████████| 150
0/1500 [00:00<00:00, 1859.13image/s]
```

```
Class_name: dogs
```

```
Train_count: 900
```

```
Test_count: 300
```

```
Valid_count: 300
```

```
Shutil images: 100%|██████████| 150
0/1500 [00:00<00:00, 1836.52image/s]
```

---

```
-----
```

Выбранная модель: shufflenet\_v2\_x1\_5

Пользовательское название модели: shufflenet\_v2\_x1\_5\_Exp3

Выбранный оптимизатор: AdamW

```
-----
```

```
Epoch 1/10 (Train): 100%|██████████| 1
18/118 [00:13<00:00, 8.59sample/s]
Epoch 1/10 (Eval): 100%|██████████| 1
71/71 [00:03<00:00, 21.21sample/s]
```

```
Epoch 1/10, Training Loss: 0.7269133725397732, Validation Loss: 0.7139619754701011
Accuracy: 0.5209039548022599, Precision: 0.6367908547880613, Recall: 0.5209039548022
599, F1-score: 0.3869826617360331
```

```
Epoch 2/10 (Train): 100%|██████████| 1
18/118 [00:13<00:00, 8.77sample/s]
Epoch 2/10 (Eval): 100%|██████████| 1
71/71 [00:03<00:00, 20.61sample/s]
```

```
Epoch 2/10, Training Loss: 0.6551946337224682, Validation Loss: 0.6580734661238342
Accuracy: 0.6220338983050847, Precision: 0.6699745048952125, Recall: 0.6220338983050
847, F1-score: 0.5918401377401095
```

```
Epoch 3/10 (Train): 100%|██████████| 1
18/118 [00:13<00:00, 8.55sample/s]
Epoch 3/10 (Eval): 100%|██████████| 1
71/71 [00:03<00:00, 21.17sample/s]
```

```
Epoch 3/10, Training Loss: 0.6309005353581962, Validation Loss: 0.6232021618529228
Accuracy: 0.6468926553672316, Precision: 0.6887359227169912, Recall: 0.6468926553672
316, F1-score: 0.6250386603984001
```

```
Epoch 4/10 (Train): 100%|██████████| 1
18/118 [00:13<00:00, 8.72sample/s]
Epoch 4/10 (Eval): 100%|██████████| 1
71/71 [00:03<00:00, 21.10sample/s]
```

Epoch 4/10, Training Loss: 0.612297336562643, Validation Loss: 0.527089755666458  
Accuracy: 0.7440677966101695, Precision: 0.7443116859745927, Recall: 0.7440677966101695, F1-score: 0.7440412453467187

Epoch 5/10 (Train): 100% | ██████████ | 1  
18/118 [00:12<00:00, 9.31sample/s]

Epoch 5/10 (Eval): 100% | ██████████ |  
71/71 [00:03<00:00, 21.58sample/s]

Epoch 5/10, Training Loss: 0.5777328033624083, Validation Loss: 0.5222016739222289  
Accuracy: 0.7536723163841808, Precision: 0.7599264256634946, Recall: 0.7536723163841808, F1-score: 0.7519867225036353

Epoch 6/10 (Train): 100% | ██████████ | 1  
18/118 [00:13<00:00, 8.97sample/s]

Epoch 6/10 (Eval): 100% | ██████████ |  
71/71 [00:03<00:00, 21.37sample/s]

Epoch 6/10, Training Loss: 0.5355319495243482, Validation Loss: 0.4932120109850404  
Accuracy: 0.7677966101694915, Precision: 0.7712224585894626, Recall: 0.7677966101694915, F1-score: 0.7671840970485969

Epoch 7/10 (Train): 100% | ██████████ | 1  
18/118 [00:12<00:00, 9.16sample/s]

Epoch 7/10 (Eval): 100% | ██████████ |  
71/71 [00:03<00:00, 21.76sample/s]

Epoch 7/10, Training Loss: 0.5358988773676115, Validation Loss: 0.4740849988440336  
Accuracy: 0.784180790960452, Precision: 0.7900694266613458, Recall: 0.784180790960452, F1-score: 0.7832202283915844

Epoch 8/10 (Train): 100% | ██████████ | 1  
18/118 [00:12<00:00, 9.41sample/s]

Epoch 8/10 (Eval): 100% | ██████████ |  
71/71 [00:03<00:00, 21.31sample/s]

Epoch 8/10, Training Loss: 0.4983661939795508, Validation Loss: 0.42904513830182245  
Accuracy: 0.7966101694915254, Precision: 0.8042384357839749, Recall: 0.7966101694915254, F1-score: 0.7951796562721214

Epoch 9/10 (Train): 100% | ██████████ | 1  
18/118 [00:12<00:00, 9.23sample/s]

Epoch 9/10 (Eval): 100% | ██████████ |  
71/71 [00:03<00:00, 21.63sample/s]

Epoch 9/10, Training Loss: 0.48673986133776215, Validation Loss: 0.4563450085493804  
Accuracy: 0.7836158192090396, Precision: 0.7869339597161977, Recall: 0.7836158192090396, F1-score: 0.7830944355606577

Epoch 10/10 (Train): 100% | ██████████ | 1  
18/118 [00:13<00:00, 8.89sample/s]

Epoch 10/10 (Eval): 100% | ██████████ |  
71/71 [00:03<00:00, 20.84sample/s]

Epoch 10/10, Training Loss: 0.48255436577702415, Validation Loss: 0.4455234140241887  
Accuracy: 0.7943502824858757, Precision: 0.7977071762117212, Recall: 0.7943502824858757, F1-score: 0.7936671632756697

Тренировка завершена!

Test: 100% | ██████████ |  
72/72 [00:03<00:00, 19.01sample/s]

```
Test Accuracy: 0.7971014492753623
Precision: 0.8002784384771963, Recall: 0.7971014492753623, F1-score: 0.7966694626701
95
Accuracy of cats : 84 %
Accuracy of dogs : 74 %
```

```
Class_name: cats
Train_count: 900
Test_count: 300
Valid_count: 300
```

```
Shutil images: 100%|██████████| 150
0/1500 [00:00<00:00, 1836.49image/s]
```

```
Class_name: dogs
Train_count: 900
Test_count: 300
Valid_count: 300
```

```
Shutil images: 100%|██████████| 150
0/1500 [00:00<00:00, 1817.81image/s]
```

---

```
-----  
Выбранная модель: shufflenet_v2_x2_0
Пользовательское название модели: shufflenet_v2_x2_0_Exp3
Выбранный оптимизатор: AdamW
```

---

```
Epoch 1/10 (Train): 100%|██████████| 1
18/118 [00:12<00:00, 9.39sample/s]
Epoch 1/10 (Eval): 100%|██████████| 1
71/71 [00:03<00:00, 20.84sample/s]
```

```
Epoch 1/10, Training Loss: 0.7935737030846732, Validation Loss: 0.7314102878678317
Accuracy: 0.5305084745762711, Precision: 0.669967058920129, Recall: 0.53050847457627
11, F1-score: 0.405264637383079
```

```
Epoch 2/10 (Train): 100%|██████████| 1
18/118 [00:12<00:00, 9.45sample/s]
Epoch 2/10 (Eval): 100%|██████████| 1
71/71 [00:03<00:00, 20.93sample/s]
```

```
Epoch 2/10, Training Loss: 0.6555172749581764, Validation Loss: 0.6848155547164928
Accuracy: 0.5937853107344633, Precision: 0.7242866860622416, Recall: 0.593785310734
633, F1-score: 0.5225034066745872
```

```
Epoch 3/10 (Train): 100%|██████████| 1
18/118 [00:12<00:00, 9.17sample/s]
Epoch 3/10 (Eval): 100%|██████████| 1
71/71 [00:03<00:00, 19.94sample/s]
```

```
Epoch 3/10, Training Loss: 0.6187150940675892, Validation Loss: 0.5425091476763709
Accuracy: 0.7259887005649718, Precision: 0.7342571889381317, Recall: 0.725988700564
9718, F1-score: 0.7238202036415637
```

```
Epoch 4/10 (Train): 100%|██████████| 1
18/118 [00:13<00:00, 8.91sample/s]
Epoch 4/10 (Eval): 100%|██████████| 1
71/71 [00:03<00:00, 17.77sample/s]
```

Epoch 4/10, Training Loss: 0.584555035796951, Validation Loss: 0.6021950020123337  
Accuracy: 0.7220338983050848, Precision: 0.722748844375963, Recall: 0.7220338983050848, F1-score: 0.7217172426382824

Epoch 5/10 (Train): 100% | ██████████ | 1  
18/118 [00:12<00:00, 9.32sample/s]  
Epoch 5/10 (Eval): 100% | ██████████ |  
71/71 [00:03<00:00, 21.20sample/s]

Epoch 5/10, Training Loss: 0.5430417240928967, Validation Loss: 0.47839818023524044  
Accuracy: 0.7548022598870057, Precision: 0.7615973742787818, Recall: 0.7548022598870057, F1-score: 0.7533923702850192

Epoch 6/10 (Train): 100% | ██████████ | 1  
18/118 [00:12<00:00, 9.43sample/s]  
Epoch 6/10 (Eval): 100% | ██████████ |  
71/71 [00:03<00:00, 22.60sample/s]

Epoch 6/10, Training Loss: 0.5269244475900027, Validation Loss: 0.556466382649322  
Accuracy: 0.7598870056497176, Precision: 0.7745750721099777, Recall: 0.7598870056497176, F1-score: 0.7563585590992731

Epoch 7/10 (Train): 100% | ██████████ | 1  
18/118 [00:12<00:00, 9.57sample/s]  
Epoch 7/10 (Eval): 100% | ██████████ |  
71/71 [00:03<00:00, 19.27sample/s]

Epoch 7/10, Training Loss: 0.4974479139136355, Validation Loss: 0.44319223625175025  
Accuracy: 0.796045197740113, Precision: 0.796244756152997, Recall: 0.796045197740113, F1-score: 0.7960328933402651

Epoch 8/10 (Train): 100% | ██████████ | 1  
18/118 [00:12<00:00, 9.44sample/s]  
Epoch 8/10 (Eval): 100% | ██████████ |  
71/71 [00:03<00:00, 20.34sample/s]

Epoch 8/10, Training Loss: 0.4849415850136187, Validation Loss: 0.49013834130966055  
Accuracy: 0.7757062146892655, Precision: 0.7775098516394516, Recall: 0.7757062146892655, F1-score: 0.775424347012126

Epoch 9/10 (Train): 100% | ██████████ | 1  
18/118 [00:13<00:00, 8.92sample/s]  
Epoch 9/10 (Eval): 100% | ██████████ |  
71/71 [00:03<00:00, 20.29sample/s]

Epoch 9/10, Training Loss: 0.4721363989645214, Validation Loss: 0.4705480290839901  
Accuracy: 0.7909604519774012, Precision: 0.792681348916647, Recall: 0.7909604519774012, F1-score: 0.7905766325745109

Epoch 10/10 (Train): 100% | ██████████ | 1  
18/118 [00:12<00:00, 9.67sample/s]  
Epoch 10/10 (Eval): 100% | ██████████ |  
71/71 [00:03<00:00, 20.39sample/s]

Epoch 10/10, Training Loss: 0.4524522041946507, Validation Loss: 0.42057042998277533  
Accuracy: 0.8090395480225989, Precision: 0.8090382004488157, Recall: 0.8090395480225989, F1-score: 0.809037841224684

Тренировка завершена!

Test: 100% | ██████████ |  
72/72 [00:04<00:00, 17.44sample/s]

```
Test Accuracy: 0.8060200668896321
Precision: 0.8062797349164013, Recall: 0.8060200668896321, F1-score: 0.8060056012825
773
Accuracy of cats : 81 %
Accuracy of dogs : 79 %
```

```
Class_name: cats
Train_count: 900
Test_count: 300
Valid_count: 300
```

```
Shutil images: 100%|██████████| 150
0/1500 [00:00<00:00, 1869.90image/s]
```

```
Class_name: dogs
Train_count: 900
Test_count: 300
Valid_count: 300
```

```
Shutil images: 100%|██████████| 150
0/1500 [00:00<00:00, 1884.15image/s]
```

---

```
-----  
Выбранная модель: swin_b  
Пользовательское название модели: swin_b_Exp3  
Выбранный оптимизатор: SGD
```

---

```
Epoch 1/10 (Train): 100%|██████████| 1
18/118 [00:20<00:00, 5.89sample/s]
Epoch 1/10 (Eval): 100%|██████████| 1
71/71 [00:04<00:00, 14.47sample/s]
```

```
Epoch 1/10, Training Loss: 0.7080182571445356, Validation Loss: 0.7573025676153474
Accuracy: 0.5310734463276836, Precision: 0.6522523823189186, Recall: 0.5310734463276
836, F1-score: 0.410225999985148
```

```
Epoch 2/10 (Train): 100%|██████████| 1
18/118 [00:19<00:00, 5.91sample/s]
Epoch 2/10 (Eval): 100%|██████████| 1
71/71 [00:05<00:00, 13.18sample/s]
```

```
Epoch 2/10, Training Loss: 0.6975098136998331, Validation Loss: 0.678034632892932
Accuracy: 0.56045197740113, Precision: 0.5769269698369159, Recall: 0.56045197740113,
F1-score: 0.5383039943623272
```

```
Epoch 3/10 (Train): 100%|██████████| 1
18/118 [00:19<00:00, 5.93sample/s]
Epoch 3/10 (Eval): 100%|██████████| 1
71/71 [00:04<00:00, 14.49sample/s]
```

```
Epoch 3/10, Training Loss: 0.6821801683630588, Validation Loss: 0.664742749963103
Accuracy: 0.5909604519774011, Precision: 0.5957596474386649, Recall: 0.5909604519774
011, F1-score: 0.5866936907030078
```

```
Epoch 4/10 (Train): 100%|██████████| 1
18/118 [00:19<00:00, 5.92sample/s]
Epoch 4/10 (Eval): 100%|██████████| 1
71/71 [00:04<00:00, 14.40sample/s]
```

Epoch 4/10, Training Loss: 0.677459497750824, Validation Loss: 0.7161367315020265  
Accuracy: 0.559322033898305, Precision: 0.6663899889117694, Recall: 0.559322033898305, F1-score: 0.4716600915643873

Epoch 5/10 (Train): 100% | 18/118 [00:19<00:00, 5.91sample/s]

Epoch 5/10 (Eval): 100% | 71/71 [00:04<00:00, 14.46sample/s]

Epoch 5/10, Training Loss: 0.6722089286259568, Validation Loss: 0.6458900169295779  
Accuracy: 0.6248587570621469, Precision: 0.6278059354275483, Recall: 0.6248587570621469, F1-score: 0.6231316113507533

Epoch 6/10 (Train): 100% | 18/118 [00:20<00:00, 5.85sample/s]

Epoch 6/10 (Eval): 100% | 71/71 [00:04<00:00, 14.49sample/s]

Epoch 6/10, Training Loss: 0.6709864178668613, Validation Loss: 0.6654033112829014  
Accuracy: 0.5887005649717514, Precision: 0.6430919921512365, Recall: 0.5887005649717514, F1-score: 0.5432092872456736

Epoch 7/10 (Train): 100% | 18/118 [00:20<00:00, 5.80sample/s]

Epoch 7/10 (Eval): 100% | 71/71 [00:04<00:00, 14.46sample/s]

Epoch 7/10, Training Loss: 0.6644090741607969, Validation Loss: 0.6366631600816371  
Accuracy: 0.6299435028248588, Precision: 0.6299571488576841, Recall: 0.6299435028248588, F1-score: 0.6298616175666033

Epoch 8/10 (Train): 100% | 18/118 [00:20<00:00, 5.74sample/s]

Epoch 8/10 (Eval): 100% | 71/71 [00:04<00:00, 14.52sample/s]

Epoch 8/10, Training Loss: 0.663513226219423, Validation Loss: 0.6373173143230589  
Accuracy: 0.6203389830508474, Precision: 0.6519613974133479, Recall: 0.6203389830508474, F1-score: 0.5981078359497953

Epoch 9/10 (Train): 100% | 18/118 [00:20<00:00, 5.71sample/s]

Epoch 9/10 (Eval): 100% | 71/71 [00:04<00:00, 14.23sample/s]

Epoch 9/10, Training Loss: 0.6502956387651186, Validation Loss: 0.6301212607130493  
Accuracy: 0.6412429378531074, Precision: 0.6534336384785039, Recall: 0.6412429378531074, F1-score: 0.6347036116197031

Epoch 10/10 (Train): 100% | 18/118 [00:20<00:00, 5.72sample/s]

Epoch 10/10 (Eval): 100% | 71/71 [00:05<00:00, 14.17sample/s]

Epoch 10/10, Training Loss: 0.6509624587821374, Validation Loss: 0.6191338747739792  
Accuracy: 0.6491525423728813, Precision: 0.6492524047082752, Recall: 0.6491525423728813, F1-score: 0.6490031741061182

Тренировка завершена!

Test: 100% | 72/72 [00:05<00:00, 13.59sample/s]

```
Test Accuracy: 0.6488294314381271
Precision: 0.6497864666855644, Recall: 0.6488294314381271, F1-score: 0.6484800010329
828
Accuracy of cats : 68 %
Accuracy of dogs : 61 %
```

```
Class_name: cats
```

```
Train_count: 900
```

```
Test_count: 300
```

```
Valid_count: 300
```

```
Shutil images: 100%|██████████| 150
0/1500 [00:00<00:00, 1833.02image/s]
```

```
Class_name: dogs
```

```
Train_count: 900
```

```
Test_count: 300
```

```
Valid_count: 300
```

```
Shutil images: 100%|██████████| 150
0/1500 [00:00<00:00, 1817.77image/s]
```

---

```
-----
```

Выбранная модель: swin\_s

Пользовательское название модели: swin\_s\_Exp3

Выбранный оптимизатор: SGD

```
-----
```

```
Epoch 1/10 (Train): 100%|██████████| 1
18/118 [00:16<00:00, 7.10sample/s]
Epoch 1/10 (Eval): 100%|██████████| 1
71/71 [00:04<00:00, 16.33sample/s]
```

```
Epoch 1/10, Training Loss: 0.7041649575805469, Validation Loss: 0.7061386359276745
Accuracy: 0.5423728813559322, Precision: 0.5986461634806793, Recall: 0.5423728813559
322, F1-score: 0.47074090677227115
```

```
Epoch 2/10 (Train): 100%|██████████| 1
18/118 [00:16<00:00, 7.16sample/s]
Epoch 2/10 (Eval): 100%|██████████| 1
71/71 [00:04<00:00, 16.82sample/s]
```

```
Epoch 2/10, Training Loss: 0.6859964698003077, Validation Loss: 0.7760645865047046
Accuracy: 0.5073446327683616, Precision: 0.5412393605719141, Recall: 0.5073446327683
616, F1-score: 0.3942265029745421
```

```
Epoch 3/10 (Train): 100%|██████████| 1
18/118 [00:16<00:00, 7.09sample/s]
Epoch 3/10 (Eval): 100%|██████████| 1
71/71 [00:04<00:00, 16.60sample/s]
```

```
Epoch 3/10, Training Loss: 0.6786832737335993, Validation Loss: 0.6907868790256102
Accuracy: 0.5259887005649717, Precision: 0.6342696132226822, Recall: 0.5259887005649
717, F1-score: 0.41109174454557157
```

```
Epoch 4/10 (Train): 100%|██████████| 1
18/118 [00:16<00:00, 7.02sample/s]
Epoch 4/10 (Eval): 100%|██████████| 1
71/71 [00:04<00:00, 16.47sample/s]
```

Epoch 4/10, Training Loss: 0.6748480725923957, Validation Loss: 0.6755115241654175  
Accuracy: 0.5717514124293785, Precision: 0.6612713955642978, Recall: 0.5717514124293  
785, F1-score: 0.4999162728621489

Epoch 5/10 (Train): 100% | ██████████ | 1  
18/118 [00:16<00:00, 7.03sample/s]  
Epoch 5/10 (Eval): 100% | ██████████ |  
71/71 [00:04<00:00, 16.67sample/s]

Epoch 5/10, Training Loss: 0.6636252487390235, Validation Loss: 0.6605640401442846  
Accuracy: 0.5915254237288136, Precision: 0.6612655767289489, Recall: 0.5915254237288  
136, F1-score: 0.5397518672744691

Epoch 6/10 (Train): 100% | ██████████ | 1  
18/118 [00:16<00:00, 7.00sample/s]  
Epoch 6/10 (Eval): 100% | ██████████ |  
71/71 [00:04<00:00, 16.28sample/s]

Epoch 6/10, Training Loss: 0.6554027668678508, Validation Loss: 0.6316716723186148  
Accuracy: 0.6480225988700565, Precision: 0.6487414992676291, Recall: 0.6480225988700  
565, F1-score: 0.6473933639422654

Epoch 7/10 (Train): 100% | ██████████ | 1  
18/118 [00:16<00:00, 6.95sample/s]  
Epoch 7/10 (Eval): 100% | ██████████ |  
71/71 [00:04<00:00, 16.11sample/s]

Epoch 7/10, Training Loss: 0.6566709152289799, Validation Loss: 0.6490745424887555  
Accuracy: 0.6288135593220339, Precision: 0.647936027858378, Recall: 0.62881355932203  
39, F1-score: 0.6153489226474679

Epoch 8/10 (Train): 100% | ██████████ | 1  
18/118 [00:16<00:00, 6.98sample/s]  
Epoch 8/10 (Eval): 100% | ██████████ |  
71/71 [00:04<00:00, 16.75sample/s]

Epoch 8/10, Training Loss: 0.6516063859303032, Validation Loss: 0.6396588810251258  
Accuracy: 0.6163841807909605, Precision: 0.6530238198379462, Recall: 0.6163841807909  
605, F1-score: 0.5934236595439685

Epoch 9/10 (Train): 100% | ██████████ | 1  
18/118 [00:17<00:00, 6.89sample/s]  
Epoch 9/10 (Eval): 100% | ██████████ |  
71/71 [00:04<00:00, 16.72sample/s]

Epoch 00009: reducing learning rate of group 0 to 1.0000e-04.

Epoch 9/10, Training Loss: 0.642211486155744, Validation Loss: 0.6479213237762451  
Accuracy: 0.6209039548022599, Precision: 0.6277875094171541, Recall: 0.6209039548022  
599, F1-score: 0.6164452247427243

Epoch 10/10 (Train): 100% | ██████████ | 1  
18/118 [00:17<00:00, 6.85sample/s]  
Epoch 10/10 (Eval): 100% | ██████████ |  
71/71 [00:04<00:00, 16.34sample/s]

Epoch 10/10, Training Loss: 0.6420243648902569, Validation Loss: 0.616802729792514  
Accuracy: 0.6655367231638418, Precision: 0.6675879342035492, Recall: 0.6655367231638  
418, F1-score: 0.6642432346537895

Тренировка завершена!

Test: 100% | ██████████ |  
72/72 [00:04<00:00, 15.70sample/s]

```
Test Accuracy: 0.6555183946488294
Precision: 0.6578612940084786, Recall: 0.6555183946488294, F1-score: 0.6545553415469
959
Accuracy of cats : 71 %
Accuracy of dogs : 60 %
```

```
Class_name: cats
Train_count: 900
Test_count: 300
Valid_count: 300
```

```
Shutil images: 100%|██████████| 150
0/1500 [00:00<00:00, 1826.63image/s]
```

```
Class_name: dogs
Train_count: 900
Test_count: 300
Valid_count: 300
```

```
Shutil images: 100%|██████████| 150
0/1500 [00:00<00:00, 1842.34image/s]
```

---

```
-----  
Выбранная модель: swin_t
Пользовательское название модели: swin_t_Exp3
Выбранный оптимизатор: SGD
```

---

```
Epoch 1/10 (Train): 100%|██████████| 1
18/118 [00:11<00:00, 9.94sample/s]
Epoch 1/10 (Eval): 100%|██████████| 1
71/71 [00:03<00:00, 19.76sample/s]
```

```
Epoch 1/10, Training Loss: 0.6996185745145064, Validation Loss: 0.7168670934809129
Accuracy: 0.5451977401129944, Precision: 0.5465165506666078, Recall: 0.5451977401129
944, F1-score: 0.5400655054571392
```

```
Epoch 2/10 (Train): 100%|██████████| 1
18/118 [00:11<00:00, 10.15sample/s]
Epoch 2/10 (Eval): 100%|██████████| 1
71/71 [00:03<00:00, 19.96sample/s]
```

```
Epoch 2/10, Training Loss: 0.6883309222783279, Validation Loss: 0.6875440782241229
Accuracy: 0.5661016949152542, Precision: 0.6029375889696083, Recall: 0.5661016949152
542, F1-score: 0.5203706328602691
```

```
Epoch 3/10 (Train): 100%|██████████| 1
18/118 [00:11<00:00, 10.09sample/s]
Epoch 3/10 (Eval): 100%|██████████| 1
71/71 [00:03<00:00, 19.51sample/s]
```

```
Epoch 3/10, Training Loss: 0.678649846853985, Validation Loss: 0.7135196406457384
Accuracy: 0.5045197740112994, Precision: 0.5841856952291274, Recall: 0.5045197740112
994, F1-score: 0.3597636985304095
```

```
Epoch 4/10 (Train): 100%|██████████| 1
18/118 [00:11<00:00, 10.05sample/s]
Epoch 4/10 (Eval): 100%|██████████| 1
71/71 [00:03<00:00, 20.07sample/s]
```

Epoch 4/10, Training Loss: 0.6676621032307104, Validation Loss: 0.6853821829887433  
Accuracy: 0.5610169491525424, Precision: 0.6122634689899661, Recall: 0.5610169491525424, F1-score: 0.5077343591615529

Epoch 5/10 (Train): 100% | [██████████] | 1  
18/118 [00:11<00:00, 10.20sample/s]

Epoch 5/10 (Eval): 100% | [██████████] |  
71/71 [00:03<00:00, 19.78sample/s]

Epoch 5/10, Training Loss: 0.6655199199772337, Validation Loss: 0.6458185707445199  
Accuracy: 0.6141242937853107, Precision: 0.6149356711946485, Recall: 0.6141242937853107, F1-score: 0.6136995962899633

Epoch 6/10 (Train): 100% | [██████████] | 1  
18/118 [00:11<00:00, 10.07sample/s]

Epoch 6/10 (Eval): 100% | [██████████] |  
71/71 [00:03<00:00, 19.51sample/s]

Epoch 6/10, Training Loss: 0.665768563421475, Validation Loss: 0.6898078489101539  
Accuracy: 0.6011299435028249, Precision: 0.6130978881037318, Recall: 0.6011299435028249, F1-score: 0.5889962449322214

Epoch 7/10 (Train): 100% | [██████████] | 1  
18/118 [00:11<00:00, 10.11sample/s]

Epoch 7/10 (Eval): 100% | [██████████] |  
71/71 [00:03<00:00, 20.18sample/s]

Epoch 7/10, Training Loss: 0.6576417562942023, Validation Loss: 0.6552351746013609  
Accuracy: 0.6016949152542372, Precision: 0.6197717854103383, Recall: 0.6016949152542372, F1-score: 0.5845865222969777

Epoch 8/10 (Train): 100% | [██████████] | 1  
18/118 [00:11<00:00, 10.06sample/s]

Epoch 8/10 (Eval): 100% | [██████████] |  
71/71 [00:03<00:00, 19.60sample/s]

Epoch 00008: reducing learning rate of group 0 to 1.0000e-04.

Epoch 8/10, Training Loss: 0.6515894457443234, Validation Loss: 0.6688495642889691  
Accuracy: 0.6016949152542372, Precision: 0.6519920546459351, Recall: 0.6016949152542372, F1-score: 0.5638330878801768

Epoch 9/10 (Train): 100% | [██████████] | 1  
18/118 [00:11<00:00, 10.21sample/s]

Epoch 9/10 (Eval): 100% | [██████████] |  
71/71 [00:03<00:00, 19.87sample/s]

Epoch 9/10, Training Loss: 0.6576145008583225, Validation Loss: 0.6311699476955974  
Accuracy: 0.635593220338983, Precision: 0.6360698510476256, Recall: 0.635593220338983, F1-score: 0.6350743821128226

Epoch 10/10 (Train): 100% | [██████████] | 1  
18/118 [00:11<00:00, 10.18sample/s]

Epoch 10/10 (Eval): 100% | [██████████] |  
71/71 [00:03<00:00, 20.23sample/s]

Epoch 10/10, Training Loss: 0.6384208066896959, Validation Loss: 0.6267363120943813  
Accuracy: 0.6491525423728813, Precision: 0.649700335772285, Recall: 0.6491525423728813, F1-score: 0.6486530097551363

Тренировка завершена!

Test: 100% | [██████████] |  
72/72 [00:04<00:00, 17.16sample/s]

```
Test Accuracy: 0.6443701226309922
Precision: 0.6458405854364809, Recall: 0.6443701226309922, F1-score: 0.6437531007901
971
Accuracy of cats : 68 %
Accuracy of dogs : 60 %
```

```
Class_name: cats
```

```
Train_count: 900
```

```
Test_count: 300
```

```
Valid_count: 300
```

```
Shutil images: 100%|██████████| 150
0/1500 [00:00<00:00, 1827.42image/s]
```

```
Class_name: dogs
```

```
Train_count: 900
```

```
Test_count: 300
```

```
Valid_count: 300
```

```
Shutil images: 100%|██████████| 150
0/1500 [00:00<00:00, 1835.87image/s]
```

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```
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```

Выбранная модель: vgg11

Пользовательское название модели: vgg11\_Exp3

Выбранный оптимизатор: SGD

```
-----
```

```
Epoch 1/10 (Train): 100%|██████████| 1
18/118 [00:08<00:00, 13.51sample/s]
Epoch 1/10 (Eval): 100%|██████████| 1
71/71 [00:02<00:00, 24.23sample/s]
```

```
Epoch 1/10, Training Loss: 0.6963448899499537, Validation Loss: 0.6933825578393236
Accuracy: 0.4966101694915254, Precision: 0.2466216604424016, Recall: 0.4966101694915
254, F1-score: 0.329573679866403
```

```
Epoch 2/10 (Train): 100%|██████████| 1
18/118 [00:08<00:00, 13.42sample/s]
Epoch 2/10 (Eval): 100%|██████████| 1
71/71 [00:02<00:00, 23.88sample/s]
```

```
Epoch 2/10, Training Loss: 0.6929576871375556, Validation Loss: 0.690832753471062
Accuracy: 0.4977401129943503, Precision: 0.7502904747296573, Recall: 0.4977401129943
503, F1-score: 0.33207752229346776
```

```
Epoch 3/10 (Train): 100%|██████████| 1
18/118 [00:08<00:00, 13.29sample/s]
Epoch 3/10 (Eval): 100%|██████████| 1
71/71 [00:02<00:00, 24.33sample/s]
```

```
Epoch 3/10, Training Loss: 0.6930301941101142, Validation Loss: 0.6892975752299788
Accuracy: 0.5067796610169492, Precision: 0.6341084465497516, Recall: 0.5067796610169
492, F1-score: 0.35911890683177594
```

```
Epoch 4/10 (Train): 100%|██████████| 1
18/118 [00:08<00:00, 13.36sample/s]
Epoch 4/10 (Eval): 100%|██████████| 1
71/71 [00:02<00:00, 24.28sample/s]
```

Epoch 4/10, Training Loss: 0.6920469501249935, Validation Loss: 0.689716427002923  
Accuracy: 0.4977401129943503, Precision: 0.7502904747296573, Recall: 0.4977401129943503, F1-score: 0.33207752229346776

Epoch 5/10 (Train): 100% | 18/118 [00:08<00:00, 13.41sample/s]

Epoch 5/10 (Eval): 100% | 71/71 [00:02<00:00, 24.41sample/s]

Epoch 5/10, Training Loss: 0.688729759710583, Validation Loss: 0.6909130160081185  
Accuracy: 0.4966101694915254, Precision: 0.2466216604424016, Recall: 0.4966101694915254, F1-score: 0.329573679866403

Epoch 6/10 (Train): 100% | 18/118 [00:08<00:00, 13.46sample/s]

Epoch 6/10 (Eval): 100% | 71/71 [00:02<00:00, 24.38sample/s]

Epoch 6/10, Training Loss: 0.6905788963002369, Validation Loss: 0.6851901760545828  
Accuracy: 0.5819209039548022, Precision: 0.61928281392382, Recall: 0.5819209039548022, F1-score: 0.5439924684623245

Epoch 7/10 (Train): 100% | 18/118 [00:08<00:00, 13.47sample/s]

Epoch 7/10 (Eval): 100% | 71/71 [00:02<00:00, 24.20sample/s]

Epoch 7/10, Training Loss: 0.6846484189276327, Validation Loss: 0.6832062075030332  
Accuracy: 0.6214689265536724, Precision: 0.6219925294620888, Recall: 0.6214689265536724, F1-score: 0.6208102958037769

Epoch 8/10 (Train): 100% | 18/118 [00:08<00:00, 13.20sample/s]

Epoch 8/10 (Eval): 100% | 71/71 [00:02<00:00, 24.49sample/s]

Epoch 8/10, Training Loss: 0.6884549409456637, Validation Loss: 0.6827307190261992  
Accuracy: 0.5779661016949152, Precision: 0.638262683272719, Recall: 0.5779661016949152, F1-score: 0.5236556350662085

Epoch 9/10 (Train): 100% | 18/118 [00:08<00:00, 13.42sample/s]

Epoch 9/10 (Eval): 100% | 71/71 [00:03<00:00, 23.61sample/s]

Epoch 9/10, Training Loss: 0.6857704597430447, Validation Loss: 0.683532290539499  
Accuracy: 0.5310734463276836, Precision: 0.6670810743412783, Recall: 0.5310734463276836, F1-score: 0.40715008135689823

Epoch 10/10 (Train): 100% | 18/118 [00:08<00:00, 13.36sample/s]

Epoch 10/10 (Eval): 100% | 71/71 [00:02<00:00, 24.18sample/s]

Epoch 10/10, Training Loss: 0.6819921626428668, Validation Loss: 0.6788975362387081  
Accuracy: 0.5949152542372881, Precision: 0.6363517705811139, Recall: 0.5949152542372881, F1-score: 0.5595649898389103

Тренировка завершена!

Test: 100% | 72/72 [00:03<00:00, 19.07sample/s]

```
Test Accuracy: 0.5880713489409142
Precision: 0.6340417049410002, Recall: 0.5880713489409142, F1-score: 0.5519475604826
023
Accuracy of cats : 87 %
Accuracy of dogs : 30 %
```

```
Class_name: cats
```

```
Train_count: 900
```

```
Test_count: 300
```

```
Valid_count: 300
```

```
Shutil images: 100%|██████████| 150
0/1500 [00:00<00:00, 1822.17image/s]
```

```
Class_name: dogs
```

```
Train_count: 900
```

```
Test_count: 300
```

```
Valid_count: 300
```

```
Shutil images: 100%|██████████| 150
0/1500 [00:00<00:00, 1815.57image/s]
```

---

```
Выбранная модель: vgg11_bn
```

```
Пользовательское название модели: vgg11_bn_Exp3
```

```
Выбранный оптимизатор: SGD
```

---

```
Epoch 1/10 (Train): 100%|██████████| 1
18/118 [00:08<00:00, 13.25sample/s]
```

```
Epoch 1/10 (Eval): 100%|██████████| 1
71/71 [00:02<00:00, 24.17sample/s]
```

```
Epoch 1/10, Training Loss: 0.7724611272122546, Validation Loss: 1.0005299039395517
Accuracy: 0.4966101694915254, Precision: 0.2466216604424016, Recall: 0.4966101694915
254, F1-score: 0.329573679866403
```

```
Epoch 2/10 (Train): 100%|██████████| 1
18/118 [00:08<00:00, 13.18sample/s]
```

```
Epoch 2/10 (Eval): 100%|██████████| 1
71/71 [00:02<00:00, 24.17sample/s]
```

```
Epoch 2/10, Training Loss: 0.7302441276146464, Validation Loss: 0.8571174845604573
Accuracy: 0.4966101694915254, Precision: 0.2466216604424016, Recall: 0.4966101694915
254, F1-score: 0.329573679866403
```

```
Epoch 3/10 (Train): 100%|██████████| 1
18/118 [00:09<00:00, 13.00sample/s]
```

```
Epoch 3/10 (Eval): 100%|██████████| 1
71/71 [00:02<00:00, 24.10sample/s]
```

```
Epoch 3/10, Training Loss: 0.7154276725655945, Validation Loss: 1.0551860452666457
Accuracy: 0.4966101694915254, Precision: 0.2466216604424016, Recall: 0.4966101694915
254, F1-score: 0.329573679866403
```

```
Epoch 4/10 (Train): 100%|██████████| 1
18/118 [00:09<00:00, 13.11sample/s]
```

```
Epoch 4/10 (Eval): 100%|██████████| 1
71/71 [00:02<00:00, 23.98sample/s]
```

Epoch 4/10, Training Loss: 0.7101686857818987, Validation Loss: 0.6953502917020334  
Accuracy: 0.5124293785310734, Precision: 0.6877532226463917, Recall: 0.5124293785310734, F1-score: 0.36823113493427273

Epoch 5/10 (Train): 100% | [██████████] | 1  
18/118 [00:08<00:00, 13.16sample/s]

Epoch 5/10 (Eval): 100% | [██████████] |  
71/71 [00:02<00:00, 24.19sample/s]

Epoch 5/10, Training Loss: 0.6801336068387562, Validation Loss: 0.8369604836581117  
Accuracy: 0.4971751412429379, Precision: 0.7501509039867397, Recall: 0.4971751412429379, F1-score: 0.3308268179758882

Epoch 6/10 (Train): 100% | [██████████] | 1  
18/118 [00:08<00:00, 13.12sample/s]

Epoch 6/10 (Eval): 100% | [██████████] |  
71/71 [00:02<00:00, 24.10sample/s]

Epoch 6/10, Training Loss: 0.672065196883491, Validation Loss: 0.9563512926931772  
Accuracy: 0.5033898305084745, Precision: 0.25340132145935074, Recall: 0.5033898305084745, F1-score: 0.3371066057745591

Epoch 7/10 (Train): 100% | [██████████] | 1  
18/118 [00:09<00:00, 13.09sample/s]

Epoch 7/10 (Eval): 100% | [██████████] |  
71/71 [00:02<00:00, 23.92sample/s]

Epoch 00007: reducing learning rate of group 0 to 1.0000e-04.

Epoch 7/10, Training Loss: 0.6653962093249463, Validation Loss: 1.020592167868284  
Accuracy: 0.5033898305084745, Precision: 0.25340132145935074, Recall: 0.5033898305084745, F1-score: 0.3371066057745591

Epoch 8/10 (Train): 100% | [██████████] | 1  
18/118 [00:09<00:00, 12.92sample/s]

Epoch 8/10 (Eval): 100% | [██████████] |  
71/71 [00:02<00:00, 23.96sample/s]

Epoch 8/10, Training Loss: 0.7067468054006952, Validation Loss: 0.6114212865546599  
Accuracy: 0.6875706214689266, Precision: 0.6977213276132528, Recall: 0.6875706214689266, F1-score: 0.683066644749693

Epoch 9/10 (Train): 100% | [██████████] | 1  
18/118 [00:09<00:00, 13.03sample/s]

Epoch 9/10 (Eval): 100% | [██████████] |  
71/71 [00:02<00:00, 23.87sample/s]

Epoch 9/10, Training Loss: 0.6553929947973601, Validation Loss: 0.6107092472793019  
Accuracy: 0.6717514124293785, Precision: 0.6915383510485493, Recall: 0.6717514124293785, F1-score: 0.6623657417953676

Epoch 10/10 (Train): 100% | [██████████] | 1  
18/118 [00:09<00:00, 13.07sample/s]

Epoch 10/10 (Eval): 100% | [██████████] |  
71/71 [00:02<00:00, 23.95sample/s]

Epoch 10/10, Training Loss: 0.6406065475753294, Validation Loss: 0.6078356393313004  
Accuracy: 0.6875706214689266, Precision: 0.699762553594635, Recall: 0.6875706214689266, F1-score: 0.6822507415004697

Тренировка завершена!

Test: 100% | [██████████] |  
72/72 [00:03<00:00, 18.29sample/s]

```
Test Accuracy: 0.6811594202898551
Precision: 0.6945346145812215, Recall: 0.6811594202898551, F1-score: 0.6761653790890
152
Accuracy of cats : 80 %
Accuracy of dogs : 55 %
```

```
Class_name: cats
```

```
Train_count: 900
```

```
Test_count: 300
```

```
Valid_count: 300
```

```
Shutil images: 100%|██████████| 150
0/1500 [00:00<00:00, 1824.41image/s]
```

```
Class_name: dogs
```

```
Train_count: 900
```

```
Test_count: 300
```

```
Valid_count: 300
```

```
Shutil images: 100%|██████████| 150
0/1500 [00:00<00:00, 1815.57image/s]
```

---

```
-----
```

Выбранная модель: vgg13

Пользовательское название модели: vgg13\_Exp3

Выбранный оптимизатор: SGD

```
-----
```

```
Epoch 1/10 (Train): 100%|██████████| 1
18/118 [00:09<00:00, 12.19sample/s]
Epoch 1/10 (Eval): 100%|██████████| 1
71/71 [00:03<00:00, 22.69sample/s]
```

```
Epoch 1/10, Training Loss: 0.6948941076608529, Validation Loss: 0.6920797631228711
Accuracy: 0.511864406779661, Precision: 0.579960489696228, Recall: 0.51186440677966
1, F1-score: 0.37112701079314736
```

```
Epoch 2/10 (Train): 100%|██████████| 1
18/118 [00:09<00:00, 12.21sample/s]
Epoch 2/10 (Eval): 100%|██████████| 1
71/71 [00:03<00:00, 22.87sample/s]
```

```
Epoch 2/10, Training Loss: 0.6958760022913358, Validation Loss: 0.6923521359761556
Accuracy: 0.4966101694915254, Precision: 0.2466216604424016, Recall: 0.4966101694915
254, F1-score: 0.329573679866403
```

```
Epoch 3/10 (Train): 100%|██████████| 1
18/118 [00:09<00:00, 12.14sample/s]
Epoch 3/10 (Eval): 100%|██████████| 1
71/71 [00:03<00:00, 22.87sample/s]
```

```
Epoch 3/10, Training Loss: 0.6947597374634146, Validation Loss: 0.6905545721956565
Accuracy: 0.49887005649717514, Precision: 0.6666705100119144, Recall: 0.498870056497
17514, F1-score: 0.33555799472486564
```

```
Epoch 4/10 (Train): 100%|██████████| 1
18/118 [00:09<00:00, 12.16sample/s]
Epoch 4/10 (Eval): 100%|██████████| 1
71/71 [00:03<00:00, 22.91sample/s]
```

Epoch 4/10, Training Loss: 0.691346105185585, Validation Loss: 0.690162891048496  
Accuracy: 0.49830508474576274, Precision: 0.7504302034473829, Recall: 0.49830508474576274, F1-score: 0.3333258014084184

Epoch 5/10 (Train): 100% | ██████████ | 1  
18/118 [00:09<00:00, 12.10sample/s]  
Epoch 5/10 (Eval): 100% | ██████████ |  
71/71 [00:03<00:00, 22.88sample/s]

Epoch 5/10, Training Loss: 0.6917975902638855, Validation Loss: 0.6892239459827121  
Accuracy: 0.4994350282485876, Precision: 0.6388434922376539, Recall: 0.4994350282485876, F1-score: 0.3377752953261428

Epoch 6/10 (Train): 100% | ██████████ | 1  
18/118 [00:09<00:00, 12.07sample/s]  
Epoch 6/10 (Eval): 100% | ██████████ |  
71/71 [00:03<00:00, 21.96sample/s]

Epoch 6/10, Training Loss: 0.6892654808595909, Validation Loss: 0.6885898662152263  
Accuracy: 0.5022598870056497, Precision: 0.6570261919486694, Recall: 0.5022598870056497, F1-score: 0.34487488474871375

Epoch 7/10 (Train): 100% | ██████████ | 1  
18/118 [00:09<00:00, 12.08sample/s]  
Epoch 7/10 (Eval): 100% | ██████████ |  
71/71 [00:03<00:00, 22.84sample/s]

Epoch 7/10, Training Loss: 0.6878906373731584, Validation Loss: 0.685923561874756  
Accuracy: 0.5310734463276836, Precision: 0.6363895248579778, Recall: 0.5310734463276836, F1-score: 0.4234036668220985

Epoch 8/10 (Train): 100% | ██████████ | 1  
18/118 [00:09<00:00, 12.12sample/s]  
Epoch 8/10 (Eval): 100% | ██████████ |  
71/71 [00:03<00:00, 22.75sample/s]

Epoch 8/10, Training Loss: 0.6857041240105137, Validation Loss: 0.6832005371481685  
Accuracy: 0.5983050847457627, Precision: 0.610555164590249, Recall: 0.5983050847457627, F1-score: 0.5854974960378481

Epoch 9/10 (Train): 100% | ██████████ | 1  
18/118 [00:09<00:00, 12.11sample/s]  
Epoch 9/10 (Eval): 100% | ██████████ |  
71/71 [00:03<00:00, 22.88sample/s]

Epoch 9/10, Training Loss: 0.6838410519730613, Validation Loss: 0.6816366235751891  
Accuracy: 0.5977401129943503, Precision: 0.6250506271901929, Recall: 0.5977401129943503, F1-score: 0.5727199082409791

Epoch 10/10 (Train): 100% | ██████████ | 1  
18/118 [00:09<00:00, 12.14sample/s]  
Epoch 10/10 (Eval): 100% | ██████████ |  
71/71 [00:03<00:00, 22.90sample/s]

Epoch 10/10, Training Loss: 0.6842471686480229, Validation Loss: 0.6793695880194842  
Accuracy: 0.603954802259887, Precision: 0.6143626336096611, Recall: 0.603954802259887, F1-score: 0.5935577324910293

Тренировка завершена!

Test: 100% | ██████████ |  
72/72 [00:03<00:00, 18.34sample/s]

```
Test Accuracy: 0.5958751393534002
Precision: 0.607690610141521, Recall: 0.5958751393534002, F1-score: 0.58595061368259
95
Accuracy of cats : 75 %
Accuracy of dogs : 44 %
```

```
Class_name: cats
```

```
Train_count: 900
```

```
Test_count: 300
```

```
Valid_count: 300
```

```
Shutil images: 100%|██████████| 150
0/1500 [00:00<00:00, 1816.34image/s]
```

```
Class_name: dogs
```

```
Train_count: 900
```

```
Test_count: 300
```

```
Valid_count: 300
```

```
Shutil images: 100%|██████████| 150
0/1500 [00:00<00:00, 1806.28image/s]
```

---

```
Выбранная модель: vgg13_bn
```

```
Пользовательское название модели: vgg13_bn_Exp3
```

```
Выбранный оптимизатор: SGD
```

---

```
Epoch 1/10 (Train): 100%|██████████| 1
18/118 [00:09<00:00, 11.82sample/s]
Epoch 1/10 (Eval): 100%|██████████| 1
71/71 [00:03<00:00, 22.58sample/s]
```

```
Epoch 1/10, Training Loss: 0.768027925432258, Validation Loss: 0.984925048836207
Accuracy: 0.5033898305084745, Precision: 0.25340132145935074, Recall: 0.503389830508
4745, F1-score: 0.3371066057745591
```

```
Epoch 2/10 (Train): 100%|██████████| 1
18/118 [00:10<00:00, 11.73sample/s]
Epoch 2/10 (Eval): 100%|██████████| 1
71/71 [00:03<00:00, 22.38sample/s]
```

```
Epoch 2/10, Training Loss: 0.7350381330032505, Validation Loss: 0.7765030538463323
Accuracy: 0.4966101694915254, Precision: 0.2466216604424016, Recall: 0.4966101694915
254, F1-score: 0.329573679866403
```

```
Epoch 3/10 (Train): 100%|██████████| 1
18/118 [00:10<00:00, 11.67sample/s]
Epoch 3/10 (Eval): 100%|██████████| 1
71/71 [00:03<00:00, 22.39sample/s]
```

```
Epoch 3/10, Training Loss: 0.710478312691759, Validation Loss: 1.0774950707531246
Accuracy: 0.4966101694915254, Precision: 0.2466216604424016, Recall: 0.4966101694915
254, F1-score: 0.329573679866403
```

```
Epoch 4/10 (Train): 100%|██████████| 1
18/118 [00:10<00:00, 11.65sample/s]
Epoch 4/10 (Eval): 100%|██████████| 1
71/71 [00:03<00:00, 22.54sample/s]
```

Epoch 4/10, Training Loss: 0.6844054300106314, Validation Loss: 0.7976521682099434  
Accuracy: 0.49887005649717514, Precision: 0.6666705100119144, Recall: 0.49887005649717514, F1-score: 0.33555799472486564

Epoch 5/10 (Train): 100% | ██████████ | 1  
18/118 [00:10<00:00, 11.71sample/s]  
Epoch 5/10 (Eval): 100% | ██████████ |  
71/71 [00:03<00:00, 22.65sample/s]

Epoch 00005: reducing learning rate of group 0 to 1.0000e-04.

Epoch 5/10, Training Loss: 0.6836410410096201, Validation Loss: 0.7943950590945906  
Accuracy: 0.5005649717514125, Precision: 0.6594636783226218, Recall: 0.5005649717514125, F1-score: 0.34024040786532944

Epoch 6/10 (Train): 100% | ██████████ | 1  
18/118 [00:10<00:00, 11.71sample/s]  
Epoch 6/10 (Eval): 100% | ██████████ |  
71/71 [00:03<00:00, 22.58sample/s]

Epoch 6/10, Training Loss: 0.7002005545512829, Validation Loss: 0.6208327880686959  
Accuracy: 0.692090395480226, Precision: 0.6962167976737516, Recall: 0.692090395480226, F1-score: 0.6901822093470542

Epoch 7/10 (Train): 100% | ██████████ | 1  
18/118 [00:10<00:00, 11.70sample/s]  
Epoch 7/10 (Eval): 100% | ██████████ |  
71/71 [00:03<00:00, 22.64sample/s]

Epoch 7/10, Training Loss: 0.6630795822311409, Validation Loss: 0.6163071806484697  
Accuracy: 0.688135593220339, Precision: 0.6887581472467535, Recall: 0.688135593220339, F1-score: 0.6877559656999358

Epoch 8/10 (Train): 100% | ██████████ | 1  
18/118 [00:10<00:00, 11.73sample/s]  
Epoch 8/10 (Eval): 100% | ██████████ |  
71/71 [00:03<00:00, 22.49sample/s]

Epoch 8/10, Training Loss: 0.6526479177884834, Validation Loss: 0.6195784237256832  
Accuracy: 0.6768361581920904, Precision: 0.6940379515552972, Recall: 0.6768361581920904, F1-score: 0.6688969816691683

Epoch 9/10 (Train): 100% | ██████████ | 1  
18/118 [00:10<00:00, 11.66sample/s]  
Epoch 9/10 (Eval): 100% | ██████████ |  
71/71 [00:03<00:00, 22.15sample/s]

Epoch 9/10, Training Loss: 0.6669626115367417, Validation Loss: 0.6225080215661539  
Accuracy: 0.6740112994350282, Precision: 0.6907785136243544, Recall: 0.6740112994350282, F1-score: 0.6660625572761415

Epoch 10/10 (Train): 100% | ██████████ | 1  
18/118 [00:10<00:00, 11.69sample/s]  
Epoch 10/10 (Eval): 100% | ██████████ |  
71/71 [00:03<00:00, 22.35sample/s]

Epoch 00010: reducing learning rate of group 0 to 1.0000e-05.

Epoch 10/10, Training Loss: 0.6584455198057694, Validation Loss: 0.623330621901205  
Accuracy: 0.6610169491525424, Precision: 0.6955362523400127, Recall: 0.6610169491525424, F1-score: 0.6444349048486316

Тренировка завершена!

Test: 100% | ██████████ |  
72/72 [00:04<00:00, 17.51sample/s]

```
Test Accuracy: 0.6622073578595318
Precision: 0.7020828289848535, Recall: 0.6622073578595318, F1-score: 0.6457552686903
513
Accuracy of cats : 88 %
Accuracy of dogs : 44 %
```

```
Class_name: cats
```

```
Train_count: 900
```

```
Test_count: 300
```

```
Valid_count: 300
```

```
Shutil images: 100%|██████████| 150
0/1500 [00:00<00:00, 1824.41image/s]
```

```
Class_name: dogs
```

```
Train_count: 900
```

```
Test_count: 300
```

```
Valid_count: 300
```

```
Shutil images: 100%|██████████| 150
0/1500 [00:00<00:00, 1781.07image/s]
```

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```
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```

Выбранная модель: vgg16

Пользовательское название модели: vgg16\_Exp3

Выбранный оптимизатор: SGD

```
-----
```

```
Epoch 1/10 (Train): 100%|██████████| 1
18/118 [00:10<00:00, 11.37sample/s]
Epoch 1/10 (Eval): 100%|██████████| 1
71/71 [00:03<00:00, 21.67sample/s]
```

```
Epoch 1/10, Training Loss: 0.6938507452413634, Validation Loss: 0.692836779827452
Accuracy: 0.4966101694915254, Precision: 0.2466216604424016, Recall: 0.4966101694915
254, F1-score: 0.329573679866403
```

```
Epoch 2/10 (Train): 100%|██████████| 1
18/118 [00:10<00:00, 11.24sample/s]
Epoch 2/10 (Eval): 100%|██████████| 1
71/71 [00:03<00:00, 22.13sample/s]
```

```
Epoch 2/10, Training Loss: 0.6938475473686513, Validation Loss: 0.6925139755515729
Accuracy: 0.4966101694915254, Precision: 0.2466216604424016, Recall: 0.4966101694915
254, F1-score: 0.329573679866403
```

```
Epoch 3/10 (Train): 100%|██████████| 1
18/118 [00:10<00:00, 11.21sample/s]
Epoch 3/10 (Eval): 100%|██████████| 1
71/71 [00:03<00:00, 21.90sample/s]
```

```
Epoch 3/10, Training Loss: 0.6921407607061278, Validation Loss: 0.6918295177362733
Accuracy: 0.515819209039548, Precision: 0.6237184265824538, Recall: 0.51581920903954
8, F1-score: 0.374924125149228
```

```
Epoch 4/10 (Train): 100%|██████████| 1
18/118 [00:10<00:00, 11.18sample/s]
Epoch 4/10 (Eval): 100%|██████████| 1
71/71 [00:03<00:00, 22.04sample/s]
```

Epoch 4/10, Training Loss: 0.6924511718367031, Validation Loss: 0.6918020042995948  
Accuracy: 0.4966101694915254, Precision: 0.2466216604424016, Recall: 0.4966101694915  
254, F1-score: 0.329573679866403

Epoch 5/10 (Train): 100% | ██████████ | 1  
18/118 [00:10<00:00, 11.30sample/s]

Epoch 5/10 (Eval): 100% | ██████████ |  
71/71 [00:03<00:00, 22.07sample/s]

Epoch 5/10, Training Loss: 0.692845807039648, Validation Loss: 0.6912080711227352  
Accuracy: 0.4966101694915254, Precision: 0.2466216604424016, Recall: 0.4966101694915  
254, F1-score: 0.329573679866403

Epoch 6/10 (Train): 100% | ██████████ | 1  
18/118 [00:10<00:00, 11.30sample/s]

Epoch 6/10 (Eval): 100% | ██████████ |  
71/71 [00:03<00:00, 22.04sample/s]

Epoch 6/10, Training Loss: 0.6913864266684996, Validation Loss: 0.6905322792166371  
Accuracy: 0.5689265536723164, Precision: 0.658777191857516, Recall: 0.56892655367231  
64, F1-score: 0.5007310177125117

Epoch 7/10 (Train): 100% | ██████████ | 1  
18/118 [00:10<00:00, 11.29sample/s]

Epoch 7/10 (Eval): 100% | ██████████ |  
71/71 [00:03<00:00, 22.05sample/s]

Epoch 7/10, Training Loss: 0.6925691856925649, Validation Loss: 0.6904868372416092  
Accuracy: 0.4971751412429379, Precision: 0.7501509039867397, Recall: 0.4971751412429  
379, F1-score: 0.3308268179758882

Epoch 8/10 (Train): 100% | ██████████ | 1  
18/118 [00:10<00:00, 11.18sample/s]

Epoch 8/10 (Eval): 100% | ██████████ |  
71/71 [00:03<00:00, 21.86sample/s]

Epoch 8/10, Training Loss: 0.6918870704840571, Validation Loss: 0.6900051899548978  
Accuracy: 0.5005649717514125, Precision: 0.7509907034427065, Recall: 0.5005649717514  
125, F1-score: 0.33829483631065366

Epoch 9/10 (Train): 100% | ██████████ | 1  
18/118 [00:10<00:00, 11.26sample/s]

Epoch 9/10 (Eval): 100% | ██████████ |  
71/71 [00:03<00:00, 22.09sample/s]

Epoch 9/10, Training Loss: 0.6911937227741302, Validation Loss: 0.6893095022204232  
Accuracy: 0.592090395480226, Precision: 0.6610142923436915, Recall: 0.59209039548022  
6, F1-score: 0.5453796650216107

Epoch 10/10 (Train): 100% | ██████████ | 1  
18/118 [00:10<00:00, 11.30sample/s]

Epoch 10/10 (Eval): 100% | ██████████ |  
71/71 [00:03<00:00, 21.32sample/s]

Epoch 10/10, Training Loss: 0.6906360130520284, Validation Loss: 0.6888162313544818  
Accuracy: 0.6474576271186441, Precision: 0.6488886146898816, Recall: 0.6474576271186  
441, F1-score: 0.6468445640422164

Тренировка завершена!

Test: 100% | ██████████ |  
72/72 [00:04<00:00, 17.52sample/s]

```
Test Accuracy: 0.6438127090301003
Precision: 0.6445922050233012, Recall: 0.6438127090301003, F1-score: 0.6430721580072
196
Accuracy of cats : 59 %
Accuracy of dogs : 68 %
```

```
Class_name: cats
```

```
Train_count: 900
```

```
Test_count: 300
```

```
Valid_count: 300
```

```
Shutil images: 100%|██████████| 150
0/1500 [00:00<00:00, 1813.38image/s]
```

```
Class_name: dogs
```

```
Train_count: 900
```

```
Test_count: 300
```

```
Valid_count: 300
```

```
Shutil images: 100%|██████████| 150
0/1500 [00:00<00:00, 1796.01image/s]
```

---

```
Выбранная модель: vgg16_bn
```

```
Пользовательское название модели: vgg16_bn_Exp3
```

```
Выбранный оптимизатор: SGD
```

---

```
Epoch 1/10 (Train): 100%|██████████| 1
18/118 [00:10<00:00, 10.92sample/s]
Epoch 1/10 (Eval): 100%|██████████| 1
71/71 [00:03<00:00, 21.70sample/s]
```

```
Epoch 1/10, Training Loss: 0.7671111038467775, Validation Loss: 1.2507489760337913
Accuracy: 0.4966101694915254, Precision: 0.2466216604424016, Recall: 0.4966101694915
254, F1-score: 0.329573679866403
```

```
Epoch 2/10 (Train): 100%|██████████| 1
18/118 [00:10<00:00, 10.87sample/s]
Epoch 2/10 (Eval): 100%|██████████| 1
71/71 [00:03<00:00, 21.77sample/s]
```

```
Epoch 2/10, Training Loss: 0.7613356988762473, Validation Loss: 0.9046241869613275
Accuracy: 0.4966101694915254, Precision: 0.2466216604424016, Recall: 0.4966101694915
254, F1-score: 0.329573679866403
```

```
Epoch 3/10 (Train): 100%|██████████| 1
18/118 [00:10<00:00, 10.92sample/s]
Epoch 3/10 (Eval): 100%|██████████| 1
71/71 [00:03<00:00, 21.71sample/s]
```

```
Epoch 3/10, Training Loss: 0.732171085258909, Validation Loss: 1.0830366689354012
Accuracy: 0.5033898305084745, Precision: 0.25340132145935074, Recall: 0.503389830508
4745, F1-score: 0.3371066057745591
```

```
Epoch 4/10 (Train): 100%|██████████| 1
18/118 [00:10<00:00, 10.88sample/s]
Epoch 4/10 (Eval): 100%|██████████| 1
71/71 [00:03<00:00, 21.81sample/s]
```

```
Epoch 4/10, Training Loss: 0.715748984394665, Validation Loss: 0.6556066695579701
Accuracy: 0.6225988700564972, Precision: 0.653702273126979, Recall: 0.62259887005649
72, F1-score: 0.6037875358365259
Epoch 5/10 (Train): 100%|██████████| 1
18/118 [00:10<00:00, 10.92sample/s]
Epoch 5/10 (Eval): 100%|██████████| 1
71/71 [00:03<00:00, 21.91sample/s]
Epoch 5/10, Training Loss: 0.6968906252598486, Validation Loss: 0.7018324622495026
Accuracy: 0.515819209039548, Precision: 0.6677494448685821, Recall: 0.51581920903954
8, F1-score: 0.3786390242393676
Epoch 6/10 (Train): 100%|██████████| 1
18/118 [00:10<00:00, 10.85sample/s]
Epoch 6/10 (Eval): 100%|██████████| 1
71/71 [00:03<00:00, 21.73sample/s]
Epoch 6/10, Training Loss: 0.6840515142829957, Validation Loss: 0.7547792485457355
Accuracy: 0.5084745762711864, Precision: 0.6749118259686158, Recall: 0.5084745762711
864, F1-score: 0.35024941061551096
Epoch 7/10 (Train): 100%|██████████| 1
18/118 [00:10<00:00, 10.88sample/s]
Epoch 7/10 (Eval): 100%|██████████| 1
71/71 [00:03<00:00, 21.39sample/s]
Epoch 00007: reducing learning rate of group 0 to 1.0000e-04.

Epoch 7/10, Training Loss: 0.6759970934217463, Validation Loss: 0.6889802187176074
Accuracy: 0.5440677966101695, Precision: 0.6786712854138315, Recall: 0.5440677966101
695, F1-score: 0.44171057796693997
Epoch 8/10 (Train): 100%|██████████| 1
18/118 [00:10<00:00, 10.78sample/s]
Epoch 8/10 (Eval): 100%|██████████| 1
71/71 [00:03<00:00, 21.45sample/s]
Epoch 8/10, Training Loss: 0.6776064972680315, Validation Loss: 0.6248657632682283
Accuracy: 0.651412429378531, Precision: 0.6536190635960384, Recall: 0.6514124293785
1, F1-score: 0.6498329089849091
Epoch 9/10 (Train): 100%|██████████| 1
18/118 [00:10<00:00, 10.85sample/s]
Epoch 9/10 (Eval): 100%|██████████| 1
71/71 [00:03<00:00, 21.77sample/s]
Epoch 9/10, Training Loss: 0.6672877914597544, Validation Loss: 0.6237956927826176
Accuracy: 0.6610169491525424, Precision: 0.6655153778609257, Recall: 0.6610169491525
424, F1-score: 0.6582963571985315
Epoch 10/10 (Train): 100%|██████████| 1
18/118 [00:10<00:00, 10.87sample/s]
Epoch 10/10 (Eval): 100%|██████████| 1
71/71 [00:03<00:00, 21.22sample/s]
Epoch 10/10, Training Loss: 0.6743837767322016, Validation Loss: 0.6263562619349378
Accuracy: 0.6463276836158192, Precision: 0.6533390769488708, Recall: 0.6463276836158
192, F1-score: 0.6416609484423714
Тренировка завершена!
Test: 100%|██████████| 1
72/72 [00:04<00:00, 17.36sample/s]
```

```
Test Accuracy: 0.6505016722408027
Precision: 0.6594203007789677, Recall: 0.6505016722408027, F1-score: 0.6462009806774
677
Accuracy of cats : 76 %
Accuracy of dogs : 53 %
```

```
Class_name: cats
Train_count: 900
Test_count: 300
Valid_count: 300
```

```
Shutil images: 100%|██████████| 150
0/1500 [00:00<00:00, 1842.34image/s]
```

```
Class_name: dogs
Train_count: 900
Test_count: 300
Valid_count: 300
```

```
Shutil images: 100%|██████████| 150
0/1500 [00:00<00:00, 1833.33image/s]
```

---

```
-----  
Выбранная модель: vgg19
Пользовательское название модели: vgg19_Exp3
Выбранный оптимизатор: SGD
```

---

```
Epoch 1/10 (Train): 100%|██████████| 1
18/118 [00:11<00:00, 10.62sample/s]
Epoch 1/10 (Eval): 100%|██████████| 1
71/71 [00:03<00:00, 21.31sample/s]
```

```
Epoch 1/10, Training Loss: 0.6936373863616221, Validation Loss: 0.6930254984036678
Accuracy: 0.4966101694915254, Precision: 0.2466216604424016, Recall: 0.4966101694915
254, F1-score: 0.329573679866403
```

```
Epoch 2/10 (Train): 100%|██████████| 1
18/118 [00:11<00:00, 10.61sample/s]
Epoch 2/10 (Eval): 100%|██████████| 1
71/71 [00:03<00:00, 21.30sample/s]
```

```
Epoch 2/10, Training Loss: 0.6940103532391221, Validation Loss: 0.6927601240449033
Accuracy: 0.4966101694915254, Precision: 0.2466216604424016, Recall: 0.4966101694915
254, F1-score: 0.329573679866403
```

```
Epoch 3/10 (Train): 100%|██████████| 1
18/118 [00:11<00:00, 10.54sample/s]
Epoch 3/10 (Eval): 100%|██████████| 1
71/71 [00:03<00:00, 21.31sample/s]
```

```
Epoch 3/10, Training Loss: 0.6941849543921196, Validation Loss: 0.6925856028236238
Accuracy: 0.4966101694915254, Precision: 0.2466216604424016, Recall: 0.4966101694915
254, F1-score: 0.329573679866403
```

```
Epoch 4/10 (Train): 100%|██████████| 1
18/118 [00:11<00:00, 10.48sample/s]
Epoch 4/10 (Eval): 100%|██████████| 1
71/71 [00:03<00:00, 21.27sample/s]
```

Epoch 4/10, Training Loss: 0.6919293875003301, Validation Loss: 0.6924917901639884  
Accuracy: 0.4966101694915254, Precision: 0.2466216604424016, Recall: 0.4966101694915  
254, F1-score: 0.329573679866403

Epoch 5/10 (Train): 100% | ██████████ | 1  
18/118 [00:11<00:00, 10.45sample/s]  
Epoch 5/10 (Eval): 100% | ██████████ |  
71/71 [00:03<00:00, 20.80sample/s]

Epoch 5/10, Training Loss: 0.691864139929424, Validation Loss: 0.6918327168556256  
Accuracy: 0.5344632768361582, Precision: 0.5909876417657338, Recall: 0.5344632768361  
582, F1-score: 0.4541058166368445

Epoch 6/10 (Train): 100% | ██████████ | 1  
18/118 [00:11<00:00, 10.52sample/s]  
Epoch 6/10 (Eval): 100% | ██████████ |  
71/71 [00:03<00:00, 21.34sample/s]

Epoch 6/10, Training Loss: 0.6920256716945933, Validation Loss: 0.6917014977352768  
Accuracy: 0.4977401129943503, Precision: 0.7502904747296573, Recall: 0.4977401129943  
503, F1-score: 0.33207752229346776

Epoch 7/10 (Train): 100% | ██████████ | 1  
18/118 [00:11<00:00, 10.54sample/s]  
Epoch 7/10 (Eval): 100% | ██████████ |  
71/71 [00:03<00:00, 21.17sample/s]

Epoch 7/10, Training Loss: 0.6921605969933884, Validation Loss: 0.6912904221796047  
Accuracy: 0.5169491525423728, Precision: 0.5960235444433227, Recall: 0.5169491525423  
728, F1-score: 0.3983694601643667

Epoch 8/10 (Train): 100% | ██████████ | 1  
18/118 [00:11<00:00, 10.51sample/s]  
Epoch 8/10 (Eval): 100% | ██████████ |  
71/71 [00:03<00:00, 21.10sample/s]

Epoch 8/10, Training Loss: 0.6927735911439074, Validation Loss: 0.6909269256106878  
Accuracy: 0.6169491525423729, Precision: 0.6259464674560848, Recall: 0.6169491525423  
729, F1-score: 0.6108367103195307

Epoch 9/10 (Train): 100% | ██████████ | 1  
18/118 [00:11<00:00, 10.52sample/s]  
Epoch 9/10 (Eval): 100% | ██████████ |  
71/71 [00:03<00:00, 21.24sample/s]

Epoch 9/10, Training Loss: 0.6910845768101315, Validation Loss: 0.6905700401060999  
Accuracy: 0.6299435028248588, Precision: 0.6338347969789262, Recall: 0.6299435028248  
588, F1-score: 0.6277185833558075

Epoch 10/10 (Train): 100% | ██████████ | 1  
18/118 [00:11<00:00, 10.49sample/s]  
Epoch 10/10 (Eval): 100% | ██████████ |  
71/71 [00:03<00:00, 21.23sample/s]

Epoch 10/10, Training Loss: 0.6908743114033058, Validation Loss: 0.69054317609065  
Accuracy: 0.49887005649717514, Precision: 0.6666705100119144, Recall: 0.498870056497  
17514, F1-score: 0.33555799472486564

Тренировка завершена!

Test: 100% | ██████████ |  
72/72 [00:04<00:00, 17.18sample/s]

```
Test Accuracy: 0.5089186176142698
Precision: 0.706199292997313, Recall: 0.5089186176142698, F1-score: 0.34969725134525
154
Accuracy of cats : 1 %
Accuracy of dogs : 99 %
```

```
Class_name: cats
```

```
Train_count: 900
```

```
Test_count: 300
```

```
Valid_count: 300
```

```
Shutil images: 100%|██████████| 150
0/1500 [00:00<00:00, 1835.57image/s]
```

```
Class_name: dogs
```

```
Train_count: 900
```

```
Test_count: 300
```

```
Valid_count: 300
```

```
Shutil images: 100%|██████████| 150
0/1500 [00:00<00:00, 1778.96image/s]
```

---

```
Выбранная модель: vgg19_bn
```

```
Пользовательское название модели: vgg19_bn_Exp3
```

```
Выбранный оптимизатор: SGD
```

---

```
Epoch 1/10 (Train): 100%|██████████| 1
18/118 [00:11<00:00, 10.23sample/s]
```

```
Epoch 1/10 (Eval): 100%|██████████| 1
71/71 [00:03<00:00, 21.10sample/s]
```

```
Epoch 1/10, Training Loss: 0.7646344296751328, Validation Loss: 1.4614790981309225
Accuracy: 0.4966101694915254, Precision: 0.2466216604424016, Recall: 0.4966101694915
254, F1-score: 0.329573679866403
```

```
Epoch 2/10 (Train): 100%|██████████| 1
18/118 [00:11<00:00, 10.08sample/s]
```

```
Epoch 2/10 (Eval): 100%|██████████| 1
71/71 [00:03<00:00, 20.85sample/s]
```

```
Epoch 2/10, Training Loss: 0.7502198137409135, Validation Loss: 0.8036059676590612
Accuracy: 0.4966101694915254, Precision: 0.2466216604424016, Recall: 0.4966101694915
254, F1-score: 0.329573679866403
```

```
Epoch 3/10 (Train): 100%|██████████| 1
18/118 [00:11<00:00, 10.15sample/s]
```

```
Epoch 3/10 (Eval): 100%|██████████| 1
71/71 [00:03<00:00, 21.13sample/s]
```

```
Epoch 3/10, Training Loss: 0.7369629455729045, Validation Loss: 0.8660748052479184
Accuracy: 0.4966101694915254, Precision: 0.2466216604424016, Recall: 0.4966101694915
254, F1-score: 0.329573679866403
```

```
Epoch 4/10 (Train): 100%|██████████| 1
18/118 [00:11<00:00, 10.12sample/s]
```

```
Epoch 4/10 (Eval): 100%|██████████| 1
71/71 [00:03<00:00, 20.95sample/s]
```

Epoch 4/10, Training Loss: 0.713674051237693, Validation Loss: 0.9420542152082853  
Accuracy: 0.4966101694915254, Precision: 0.2466216604424016, Recall: 0.4966101694915  
254, F1-score: 0.329573679866403

Epoch 5/10 (Train): 100% | ██████████ | 1  
18/118 [00:11<00:00, 10.11sample/s]  
Epoch 5/10 (Eval): 100% | ██████████ |  
71/71 [00:03<00:00, 20.98sample/s]

Epoch 00005: reducing learning rate of group 0 to 1.0000e-04.

Epoch 5/10, Training Loss: 0.717456551830164, Validation Loss: 1.0170864792025023  
Accuracy: 0.5033898305084745, Precision: 0.25340132145935074, Recall: 0.503389830508  
4745, F1-score: 0.3371066057745591

Epoch 6/10 (Train): 100% | ██████████ | 1  
18/118 [00:11<00:00, 10.09sample/s]  
Epoch 6/10 (Eval): 100% | ██████████ |  
71/71 [00:03<00:00, 20.91sample/s]

Epoch 6/10, Training Loss: 0.7401203692713096, Validation Loss: 0.6808098729720897  
Accuracy: 0.5751412429378531, Precision: 0.6083565309337651, Recall: 0.5751412429378  
531, F1-score: 0.5372544138907626

Epoch 7/10 (Train): 100% | ██████████ | 1  
18/118 [00:11<00:00, 10.16sample/s]  
Epoch 7/10 (Eval): 100% | ██████████ |  
71/71 [00:03<00:00, 20.94sample/s]

Epoch 7/10, Training Loss: 0.7014212665171633, Validation Loss: 0.6785450443036138  
Accuracy: 0.5728813559322034, Precision: 0.6330169643983822, Recall: 0.5728813559322  
034, F1-score: 0.515595249388038

Epoch 8/10 (Train): 100% | ██████████ | 1  
18/118 [00:11<00:00, 10.08sample/s]  
Epoch 8/10 (Eval): 100% | ██████████ |  
71/71 [00:03<00:00, 20.88sample/s]

Epoch 8/10, Training Loss: 0.7019087988386721, Validation Loss: 0.678755540463884  
Accuracy: 0.572316384180791, Precision: 0.622654971199706, Recall: 0.5723163841807  
91, F1-score: 0.5205456609670196

Epoch 9/10 (Train): 100% | ██████████ | 1  
18/118 [00:11<00:00, 10.04sample/s]  
Epoch 9/10 (Eval): 100% | ██████████ |  
71/71 [00:03<00:00, 20.88sample/s]

Epoch 9/10, Training Loss: 0.705193249700987, Validation Loss: 0.6788045944130353  
Accuracy: 0.5700564971751413, Precision: 0.6352063273082194, Recall: 0.5700564971751  
413, F1-score: 0.5081989827460096

Epoch 10/10 (Train): 100% | ██████████ | 1  
18/118 [00:11<00:00, 9.95sample/s]  
Epoch 10/10 (Eval): 100% | ██████████ |  
71/71 [00:03<00:00, 20.84sample/s]

Epoch 10/10, Training Loss: 0.6847763118357668, Validation Loss: 0.6752897482470605  
Accuracy: 0.6045197740112994, Precision: 0.6254449308012172, Recall: 0.6045197740112  
994, F1-score: 0.5858061401751914

Тренировка завершена!

Test: 100% | ██████████ |  
72/72 [00:04<00:00, 17.51sample/s]

Test Accuracy: 0.5947603121516165  
Precision: 0.6173568099620843, Recall: 0.5947603121516165, F1-score: 0.5761794556853  
542

Accuracy of cats : 80 %  
Accuracy of dogs : 38 %

Class\_name: cats

Train\_count: 900

Test\_count: 300

Valid\_count: 300

Shutil images: 100% | ████████████████████████████████████ | 150  
0/1500 [00:00<00:00, 1831.08image/s]

Class\_name: dogs

Train\_count: 900

Test\_count: 300

Valid\_count: 300

Shutil images: 100% | ████████████████████████████████████ | 150  
0/1500 [00:00<00:00, 1841.85image/s]

---

Выбранная модель: vit\_b\_16

Пользовательское название модели: vit\_b\_16\_Exp3

Выбранный оптимизатор: SGD

---

Epoch 1/10 (Train): 0%  
| 0/118 [00:00<?, ?sample/s]

09:51:08-660810 ERROR

GraduateModel

Traceback (most recent call last)

```
in graduate:59
  56 |         num_workers=num_workers,
  57 |         pin_memory=pin_memory,
  58 |         seed=seed)
> 59 |         train.graduate()
  60 |     except Exception as ex:
  61 |         log.exception("GraduateModel\"
  62 |
```

```
in graduate:111
  108 |         # Выводим информацию
  109 |         print(self.__str__())
  110 |         # Обучаем
> 111 |         self.train_model()
  112 |         # Тестируем
  113 |         self.evaluate_model()
  114 |
```

```
in train_model:417
  414 |             unit=
  415 |             inputs, labels = inputs.cuda()
  416 |             self.optimizer.zero_grad()
> 417 |             outputs = self.model(inputs)
  418 |             loss = self.criterion(outputs)
  419 |             loss.backward()
  420 |             self.optimizer.step()
```

```
C:\Users\NightMare\PycharmProjects\CVtools\venv\lib\site-packages\torch\nn\functional.py:1130 in _call_impl
```

```
1127 |         # this function, and just call forward
1128 |         if not (self._backward_hooks or self._global_backward_hooks
1129 |                 or self._global_forward_hooks or
> 1130 |                 return forward_call(*input, **kwargs)
1131 |             # Do not call functions when jit is used
1132 |             full_backward_hooks, non_full_backward_hooks
1133 |             if self._backward_hooks or self._global_backward_hooks
1134 |                 or self._global_forward_hooks)
```

```
C:\Users\NightMare\PycharmProjects\CVtools\venv\lib\site-packages\torch\vision\models\detection\transformer.py:291 in forward
```

```
288 |
289 |     def forward(self, x: torch.Tensor):
290 |         # Reshape and permute the input tensor
> 291 |         x = self._process_input(x)
292 |         n = x.shape[0]
293 |
294 |         # Expand the class token to the full
```

```
C:\Users\NightMare\PycharmProjects\CVtools\venv\lib  
ision_transformer.py:271 in _process_input
```

```
268     def _process_input(self, x: torch.Tensor  
269         n, c, h, w = x.shape  
270         p = self.patch_size  
271     torch._assert(h == self.image_size,  
272         torch._assert(w == self.image_size,  
273             n_h = h // p  
274             n_w = w // p
```

```
C:\Users\NightMare\PycharmProjects\CVtools\venv\lib  
3 in _assert
```

```
830     if type(condition) is not torch.Tensor:  
831         return handle_torch_function(_assert  
832             assert condition, message  
833             #####  
834 # Import most common subpackages
```

**AssertionError:** Wrong image height!

```
Class_name: cats  
Train_count: 900  
Test_count: 300  
Valid_count: 300
```

```
Shutil images: 100%|██████████| 150  
0/1500 [00:00<00:00, 1802.48image/s]
```

```
Class_name: dogs  
Train_count: 900  
Test_count: 300  
Valid_count: 300
```

```
Shutil images: 100%|██████████| 150  
0/1500 [00:00<00:00, 1802.48image/s]
```

---

```
-----  
Выбранная модель: vit_b_32  
Пользовательское название модели: vit_b_32_Exp3  
Выбранный оптимизатор: SGD  
-----
```

```
Epoch 1/10 (Train):  0%|  
| 0/118 [00:00<?, ?sample/s]
```

09:51:15-899437 ERROR

GraduateModel

Traceback (most recent call last)

```
in graduate:59
  56 |         num_workers=num_workers,
  57 |         pin_memory=pin_memory,
  58 |         seed=seed)
> 59 |         train.graduate()
  60 |     except Exception as ex:
  61 |         log.exception("GraduateModel\"
  62 |
```

```
in graduate:111
  108 |         # Выводим информацию
  109 |         print(self.__str__())
  110 |         # Обучаем
> 111 |         self.train_model()
  112 |         # Тестируем
  113 |         self.evaluate_model()
  114 |
```

```
in train_model:417
  414 |             unit=
  415 |             inputs, labels = inputs.cuda()
  416 |             self.optimizer.zero_grad()
> 417 |             outputs = self.model(inputs)
  418 |             loss = self.criterion(outputs)
  419 |             loss.backward()
  420 |             self.optimizer.step()
```

```
C:\Users\NightMare\PycharmProjects\CVtools\venv\lib\site-packages\torch\nn\functional.py:1130 in _call_impl
```

```
1127 |         # this function, and just call forward
1128 |         if not (self._backward_hooks or self._global_backward_hooks
1129 |                 or self._global_forward_hooks or
> 1130 |                 return forward_call(*input, **kwargs)
1131 |             # Do not call functions when jit is used
1132 |             full_backward_hooks, non_full_backward_hooks
1133 |             if self._backward_hooks or self._global_backward_hooks
1134 |                 or self._global_forward_hooks)
```

```
C:\Users\NightMare\PycharmProjects\CVtools\venv\lib\site-packages\torch\vision\models\detection\transformer.py:291 in forward
```

```
288 |
289 |     def forward(self, x: torch.Tensor):
290 |         # Reshape and permute the input tensor
> 291 |         x = self._process_input(x)
292 |         n = x.shape[0]
293 |
294 |         # Expand the class token to the full
```

C:\Users\NightMare\PycharmProjects\CVtools\venv\lib\\\_l  
ision\_transformer.py:271 in \_process\_input

```
268     def _process_input(self, x: torch.Tensor
269         n, c, h, w = x.shape
270         p = self.patch_size
271         torch._assert(h == self.image_size,
272                     torch._assert(w == self.image_size,
273                     n_h = h // p
274                     n_w = w // p
```

```
C:\Users\NightMare\PycharmProjects\CVtools\venv\lib  
3 in _assert
```

```
830 |     if type(condition) is not torch.Tensor:
831 |         return handle_torch_function(_assert
832 |             assert condition, message
833 |     #####
834 |
835 # Import most common subpackages
```

**AssertionError:** Wrong image height!

```
Class_name: cats
Train_count: 900
Test_count: 300
Valid_count: 300
Shutil images: 100%|██████████| 150
0/1500 [00:00<00:00, 1822.19image/s]
Class_name: dogs
Train_count: 900
Test_count: 300
Valid_count: 300
Shutil images: 100%|██████████| 150
0/1500 [00:00<00:00, 1828.86image/s]
```

Выбранная модель: wide\_resnet101\_2  
Пользовательское название модели: wide\_resnet101\_2\_Exp3  
Выбранный оптимизатор: SGD

```
Epoch 1/10 (Train): 100%|██████████| 1  
18/118 [00:16<00:00, 7.02sample/s]  
Epoch 1/10 (Eval): 100%|██████████|  
71/71 [00:04<00:00, 15.97sample/s]  
Epoch 1/10, Training Loss: 0.7386239807612262, Validation Loss: 2361987885.559322  
Accuracy: 0.5033898305084745, Precision: 0.25340132145935074, Recall: 0.503389830508  
4745, F1-score: 0.3371066057745591
```

```
Epoch 2/10 (Train): 100%|██████████| 1  
18/118 [00:16<00:00, 6.97sample/s]  
Epoch 2/10 (Eval): 100%|██████████|  
71/71 [00:04<00:00, 15.93sample/s]  
Epoch 2/10, Training Loss: 0.734031939661348, Validation Loss: 194.87758056883175  
Accuracy: 0.4966101694915254, Precision: 0.2466216604424016, Recall: 0.4966101694915  
254, F1-score: 0.329573679866403  
Epoch 3/10 (Train): 100%|██████████| 1  
18/118 [00:17<00:00, 6.94sample/s]  
Epoch 3/10 (Eval): 100%|██████████|  
71/71 [00:04<00:00, 15.93sample/s]  
Epoch 3/10, Training Loss: 0.7338140118187287, Validation Loss: 1.1445690379136026  
Accuracy: 0.5033898305084745, Precision: 0.25340132145935074, Recall: 0.503389830508  
4745, F1-score: 0.3371066057745591  
Epoch 4/10 (Train): 100%|██████████| 1  
18/118 [00:17<00:00, 6.84sample/s]  
Epoch 4/10 (Eval): 100%|██████████|  
71/71 [00:04<00:00, 15.79sample/s]  
Epoch 4/10, Training Loss: 0.730365456759889, Validation Loss: 1.2609843672332117  
Accuracy: 0.4966101694915254, Precision: 0.2466216604424016, Recall: 0.4966101694915  
254, F1-score: 0.329573679866403  
Epoch 5/10 (Train): 100%|██████████| 1  
18/118 [00:17<00:00, 6.83sample/s]  
Epoch 5/10 (Eval): 100%|██████████|  
71/71 [00:04<00:00, 15.79sample/s]  
Epoch 5/10, Training Loss: 0.722691817961567, Validation Loss: 1.5124709703407044  
Accuracy: 0.4966101694915254, Precision: 0.2466216604424016, Recall: 0.4966101694915  
254, F1-score: 0.329573679866403  
Epoch 6/10 (Train): 100%|██████████| 1  
18/118 [00:17<00:00, 6.86sample/s]  
Epoch 6/10 (Eval): 100%|██████████|  
71/71 [00:04<00:00, 15.94sample/s]  
Epoch 00006: reducing learning rate of group 0 to 1.0000e-04.  
Epoch 6/10, Training Loss: 0.7260328164389096, Validation Loss: 1.1631909140338332  
Accuracy: 0.4966101694915254, Precision: 0.2466216604424016, Recall: 0.4966101694915  
254, F1-score: 0.329573679866403  
Epoch 7/10 (Train): 100%|██████████| 1  
18/118 [00:17<00:00, 6.80sample/s]  
Epoch 7/10 (Eval): 100%|██████████|  
71/71 [00:04<00:00, 15.81sample/s]  
Epoch 7/10, Training Loss: 0.7251089372336661, Validation Loss: 0.6988914149292444  
Accuracy: 0.5259887005649717, Precision: 0.550104003452407, Recall: 0.52598870056497  
17, F1-score: 0.46845447533660595  
Epoch 8/10 (Train): 100%|██████████| 1  
18/118 [00:17<00:00, 6.79sample/s]  
Epoch 8/10 (Eval): 100%|██████████|  
71/71 [00:04<00:00, 15.98sample/s]  
Epoch 8/10, Training Loss: 0.6882766158672041, Validation Loss: 0.688672840258496  
Accuracy: 0.5305084745762711, Precision: 0.5393296937805273, Recall: 0.5305084745762  
711, F1-score: 0.4962833029340408
```

```
Epoch 9/10 (Train): 100%|██████████| 1  
18/118 [00:17<00:00, 6.77sample/s]  
Epoch 9/10 (Eval): 100%|██████████| 1  
71/71 [00:04<00:00, 15.73sample/s]  
Epoch 9/10, Training Loss: 0.6921082560077402, Validation Loss: 0.689037522353695  
Accuracy: 0.5322033898305085, Precision: 0.5439369320258433, Recall: 0.5322033898305085, F1-score: 0.5040633085128926  
Epoch 10/10 (Train): 100%|██████████| 1  
18/118 [00:17<00:00, 6.64sample/s]  
Epoch 10/10 (Eval): 100%|██████████| 1  
71/71 [00:04<00:00, 15.21sample/s]  
Epoch 10/10, Training Loss: 0.6902887092537857, Validation Loss: 0.6883145601062451  
Accuracy: 0.5344632768361582, Precision: 0.5384045553231955, Recall: 0.5344632768361582, F1-score: 0.5254590083265644  
Тренировка завершена!  
Test: 100%|██████████| 1  
72/72 [00:04<00:00, 14.44sample/s]  
Test Accuracy: 0.5574136008918618  
Precision: 0.5610034200052224, Recall: 0.5574136008918618, F1-score: 0.5485738704089438  
Accuracy of cats : 41 %  
Accuracy of dogs : 69 %  
  
Class_name: cats  
Train_count: 900  
Test_count: 300  
Valid_count: 300  
Shutil images: 100%|██████████| 150  
0/1500 [00:00<00:00, 1809.82image/s]  
Class_name: dogs  
Train_count: 900  
Test_count: 300  
Valid_count: 300  
Shutil images: 100%|██████████| 150  
0/1500 [00:00<00:00, 1780.43image/s]
```

---

Выбранная модель: wide\_resnet50\_2  
Пользовательское название модели: wide\_resnet50\_2\_Exp3  
Выбранный оптимизатор: SGD

---

```
Epoch 1/10 (Train): 100%|██████████| 1  
18/118 [00:12<00:00, 9.81sample/s]  
Epoch 1/10 (Eval): 100%|██████████| 1  
71/71 [00:03<00:00, 18.71sample/s]  
Epoch 1/10, Training Loss: 0.739040683045912, Validation Loss: 411.0818102130782  
Accuracy: 0.4966101694915254, Precision: 0.2466216604424016, Recall: 0.4966101694915254, F1-score: 0.329573679866403
```

```
Epoch 2/10 (Train): 100%|██████████| 1  
18/118 [00:11<00:00, 10.03sample/s]  
Epoch 2/10 (Eval): 100%|██████████|  
71/71 [00:03<00:00, 19.19sample/s]  
Epoch 2/10, Training Loss: 0.7262439750496524, Validation Loss: 17.189892346882736  
Accuracy: 0.5033898305084745, Precision: 0.25340132145935074, Recall: 0.503389830508  
4745, F1-score: 0.3371066057745591  
Epoch 3/10 (Train): 100%|██████████| 1  
18/118 [00:11<00:00, 10.02sample/s]  
Epoch 3/10 (Eval): 100%|██████████|  
71/71 [00:03<00:00, 19.37sample/s]  
Epoch 3/10, Training Loss: 0.739258738164615, Validation Loss: 12.873249745532137  
Accuracy: 0.4966101694915254, Precision: 0.2466216604424016, Recall: 0.4966101694915  
254, F1-score: 0.329573679866403  
Epoch 4/10 (Train): 100%|██████████| 1  
18/118 [00:11<00:00, 9.94sample/s]  
Epoch 4/10 (Eval): 100%|██████████|  
71/71 [00:03<00:00, 19.33sample/s]  
Epoch 4/10, Training Loss: 0.7267758898024517, Validation Loss: 11.037037145777862  
Accuracy: 0.4966101694915254, Precision: 0.2466216604424016, Recall: 0.4966101694915  
254, F1-score: 0.329573679866403  
Epoch 5/10 (Train): 100%|██████████| 1  
18/118 [00:11<00:00, 9.94sample/s]  
Epoch 5/10 (Eval): 100%|██████████|  
71/71 [00:03<00:00, 19.16sample/s]  
Epoch 5/10, Training Loss: 0.732670702187883, Validation Loss: 7.421102724574759  
Accuracy: 0.4966101694915254, Precision: 0.2466216604424016, Recall: 0.4966101694915  
254, F1-score: 0.329573679866403  
Epoch 6/10 (Train): 100%|██████████| 1  
18/118 [00:11<00:00, 9.87sample/s]  
Epoch 6/10 (Eval): 100%|██████████|  
71/71 [00:03<00:00, 18.90sample/s]  
Epoch 6/10, Training Loss: 0.7322747714089272, Validation Loss: 1.3241790116127938  
Accuracy: 0.5033898305084745, Precision: 0.25340132145935074, Recall: 0.503389830508  
4745, F1-score: 0.3371066057745591  
Epoch 7/10 (Train): 100%|██████████| 1  
18/118 [00:11<00:00, 9.95sample/s]  
Epoch 7/10 (Eval): 100%|██████████|  
71/71 [00:03<00:00, 19.24sample/s]  
Epoch 7/10, Training Loss: 0.7270233834433539, Validation Loss: 12.582478697374883  
Accuracy: 0.4966101694915254, Precision: 0.2466216604424016, Recall: 0.4966101694915  
254, F1-score: 0.329573679866403  
Epoch 8/10 (Train): 100%|██████████| 1  
18/118 [00:12<00:00, 9.65sample/s]  
Epoch 8/10 (Eval): 100%|██████████|  
71/71 [00:03<00:00, 18.51sample/s]  
Epoch 8/10, Training Loss: 0.725543797932825, Validation Loss: 1.1339996898662572  
Accuracy: 0.5033898305084745, Precision: 0.25340132145935074, Recall: 0.503389830508  
4745, F1-score: 0.3371066057745591  
Epoch 9/10 (Train): 100%|██████████| 1  
18/118 [00:12<00:00, 9.71sample/s]  
Epoch 9/10 (Eval): 100%|██████████|  
71/71 [00:03<00:00, 18.89sample/s]
```

Epoch 9/10, Training Loss: 0.7120199904446722, Validation Loss: 14.106627434602608  
Accuracy: 0.4966101694915254, Precision: 0.2466216604424016, Recall: 0.4966101694915  
254, F1-score: 0.329573679866403

Epoch 10/10 (Train): 100% | ██████████ | 1  
18/118 [00:12<00:00, 9.70sample/s]  
Epoch 10/10 (Eval): 100% | ██████████ |  
71/71 [00:03<00:00, 18.60sample/s]

Epoch 10/10, Training Loss: 0.7370987809731059, Validation Loss: 1.200941012446153  
Accuracy: 0.4966101694915254, Precision: 0.2466216604424016, Recall: 0.4966101694915  
254, F1-score: 0.329573679866403

Тренировка завершена!

Test: 100% | ██████████ |  
72/72 [00:04<00:00, 16.57sample/s]

Test Accuracy: 0.5039018952062431  
Precision: 0.25391711999244354, Recall: 0.5039018952062431, F1-score: 0.337677771138  
95014  
Accuracy of cats : 0 %  
Accuracy of dogs : 100 %

09:58:05-192648 ERROR

MetricsVisualiser

Traceback (most recent call last)

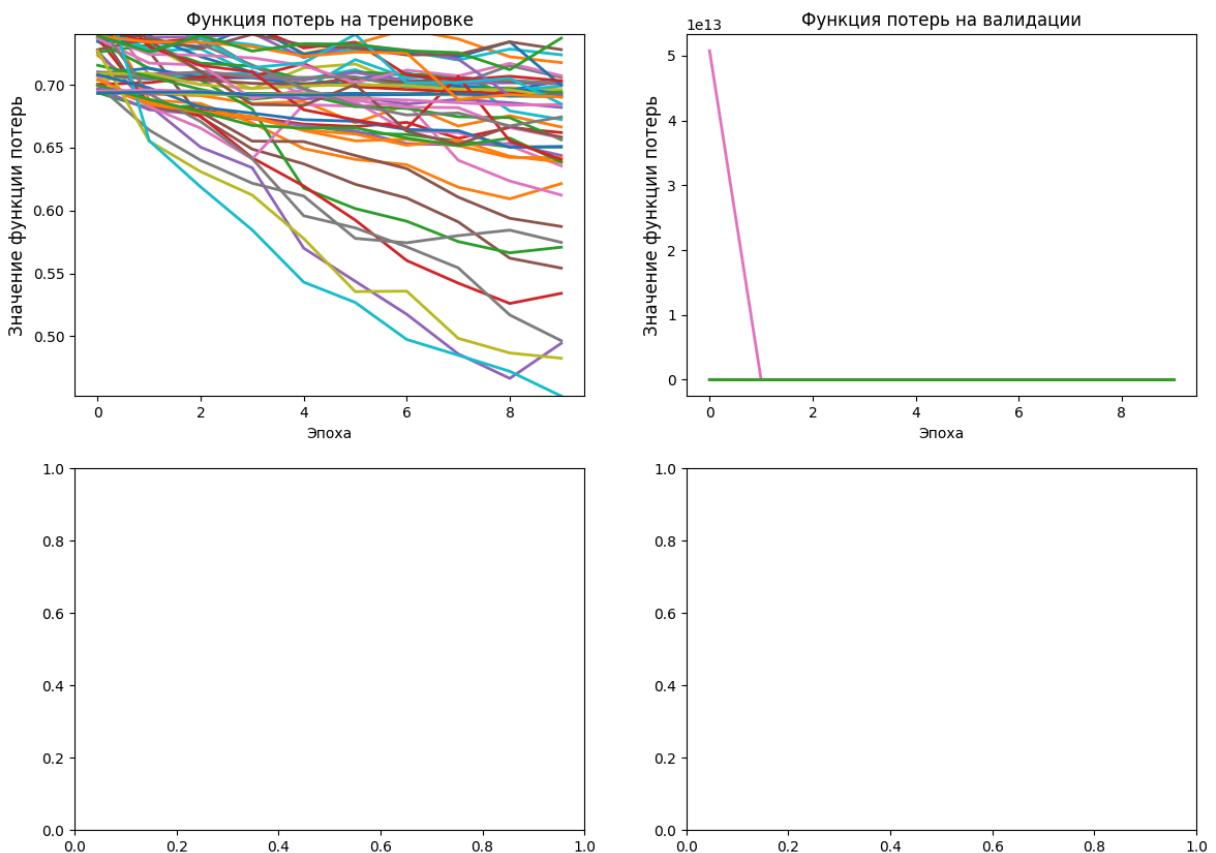
```
in graduate:65
    62 |         # Построение графиков
    63 |         try:
    64 |             metrics_visualizer = MetricsVisua
    65 |             path_to_metrics_train=path_to_metrics_train,
    66 |             path_to_metrics_test=path_to_metrics_test,
    67 |             path_to_save_plots=path_to_save_plots)
    68 |
in __init__:23
    20 |         # Инициализируем сохранение графиков
    21 |         self.load_train_metrics()
    22 |         self.load_test_metrics()
    23 |         self.plot_metrics()
    24 |
    25 |     def _load_metrics(self, directory, files):
    26 |         for file in os.listdir(directory):
in plot_metrics:71
    68 |         upper_limit = np.percentile(all_valu
        |         перцентиль)
    69 |
    70 |         # Применение ограничений
    71 |         axs[0, 1].set_ylim(lower_limit, uppe
    72 |
    73 |         for model, f1_valid in self.f1_value
    74 |             axs[1, 0].plot(f1_valid, label=mod
C:\Users\NightMare\PycharmProjects\CVtools\venv\lib\py
e.py:3973 in set_ylim
    3970 |             if top is not None:
    3971 |                 raise TypeError("Cannot pas
    3972 |                 top = ymax
    3973 |             return self.yaxis._set_lim(bottom,
    3974 |
    3975 |             get_yscale = _axis_method_wrapper("yaxi
    3976 |             set_yscale = _axis_method_wrapper("yaxi
C:\Users\NightMare\PycharmProjects\CVtools\venv\lib\py
e.py:236 in _set_lim
    1233 |             name = self._get_axis_name()
    1234 |
    1235 |             self.axes._process_unit_info([(name
    1236 |             v0 = self.axes._validate_converted_
```

```

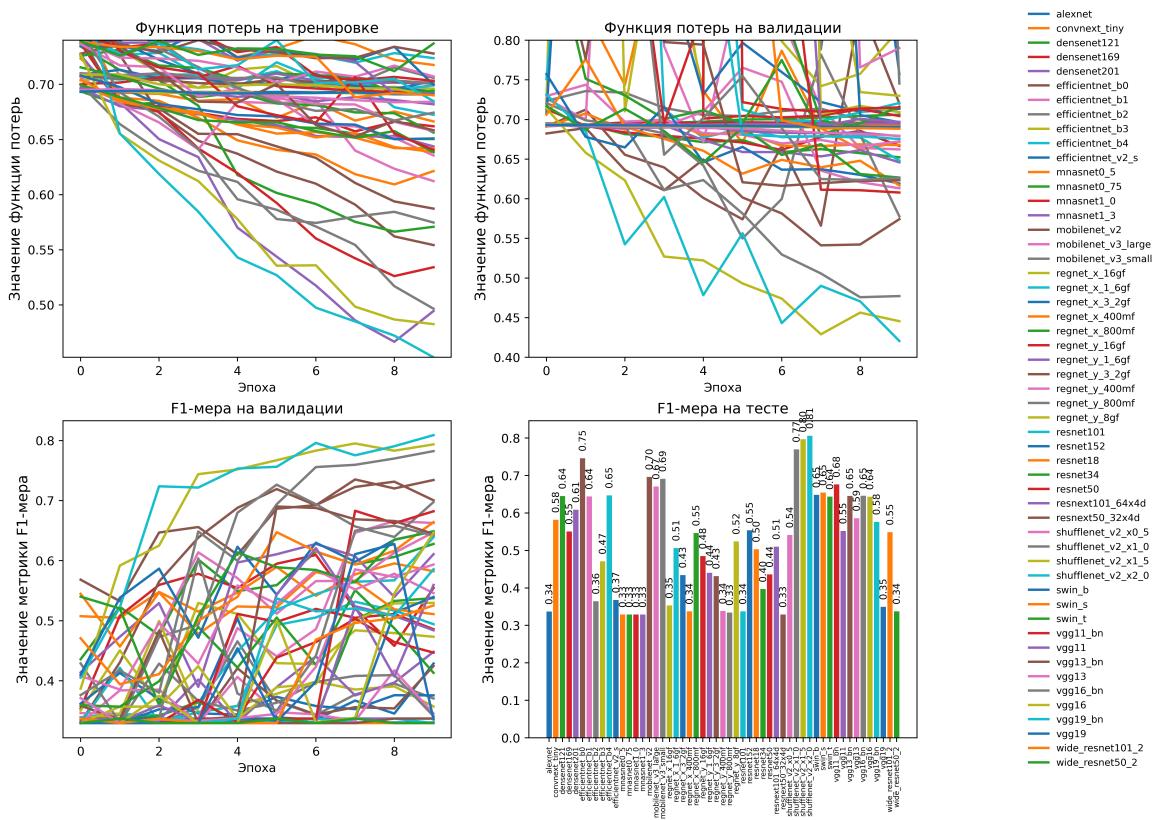
1237 |         v1 = self.axes._validate_converted_
1238 |
1239 |     if v0 is None or v1 is None:
|
C:\Users\NightMare\PycharmProjects\CVtools\venv\lib.py:3660 in _validate_converted_limits
|
3657 |             converted_limit = converted_
3658 |             if (isinstance(converted_limit,
3659 |                             and not np.isfinite(converted_
| > 3660 |                             raise ValueError("Axis limit
3661 |                             return converted_limit
3662 |
3663 def set_xlim(self, left=None, right=None):

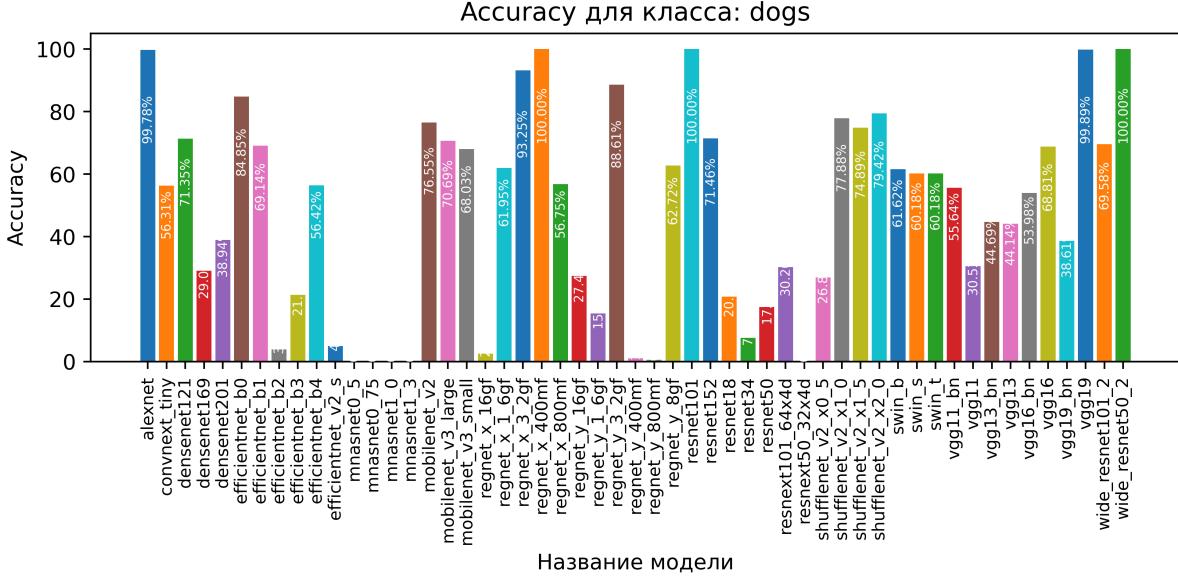
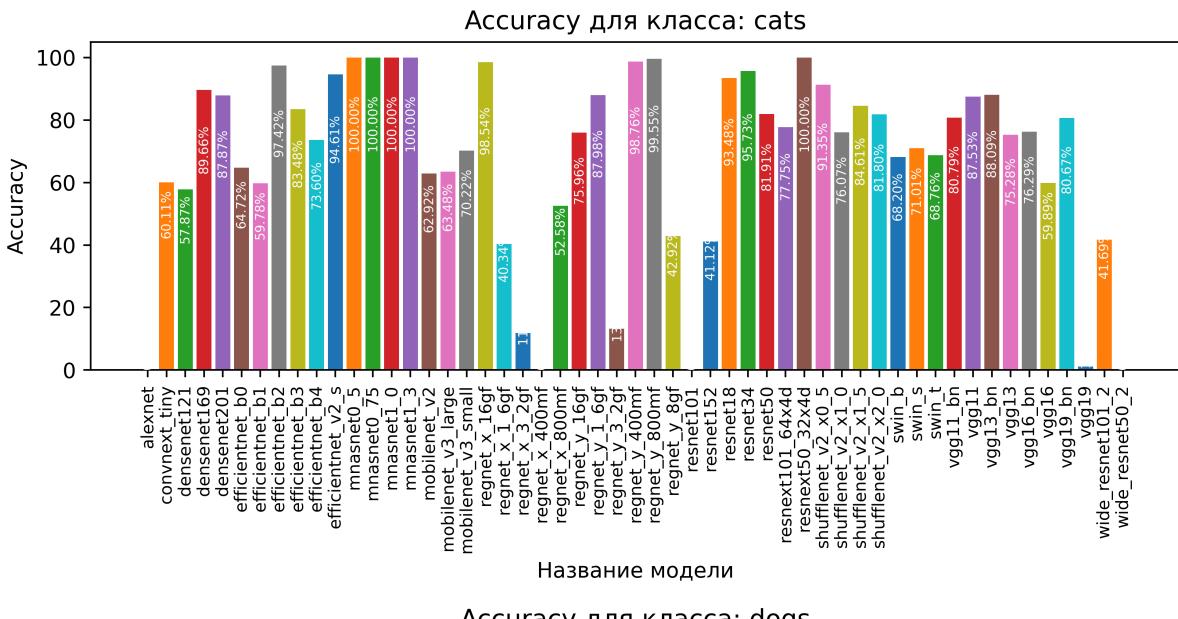
```

**ValueError:** Axis limits cannot be NaN or Inf



```
In [221]: ipd.display(ipd.Image(filename='./plot/PlotsMetrics_Exp3.png'))
ipd.display(ipd.Image(filename='./plot/AccuracyForClass_Exp3.png'))
```





**Exp4 / Дисбаланс классов + focal\_loss + class\_weights**

```
In [222... graduate_pipeline = validate_with_pydantic(EntryGraduateModel)(GraduateModelPipeliner
    entry = {
        "prefix": "Exp4",
        "models": model_list,
        "name_optimizers": optimizer_list,
        "name_loss": "FocalLoss",
        "ratio": (70, 15, 15),
        "size_img": (64, 64),
        "batch_size": 25,
        "num_epochs": 10,
        "class_percentage": {"cats": 0.3, "dogs": 1.0},
        "is_use_class_weights": True
    }
)
```

```
In [223... graduate_pipeline.graduate()
```

```
Class_name: cats
Train_count: 900
Test_count: 300
Valid_count: 300
Shutil images: 100%|██████████| 150 /1500 [00:00<00:00, 1872.98image/s]
Class_name: dogs
Train_count: 900
Test_count: 300
Valid_count: 300
Shutil images: 100%|██████████| 150 /1500 [00:00<00:00, 1863.21image/s]
```

---

```
-----  
Выбранная модель: alexnet  
Пользовательское название модели: alexnet_Exp4  
Выбранный оптимизатор: SGD
```

---

```
Epoch 1/10 (Train): 100%|██████████| 1 /117 [00:06<00:00, 16.75sample/s]
Epoch 1/10 (Eval): 100%|██████████| 1 /71 [00:02<00:00, 24.38sample/s]
Epoch 1/10, Training Loss: 0.7801671731014461, Validation Loss: 0.7797609333601375
Accuracy: 0.5033898305084745, Precision: 0.25340132145935074, Recall: 0.503389830508
4745, F1-score: 0.3371066057745591
Epoch 2/10 (Train): 100%|██████████| 1 /117 [00:06<00:00, 17.15sample/s]
Epoch 2/10 (Eval): 100%|██████████| 1 /71 [00:02<00:00, 25.73sample/s]
Epoch 2/10, Training Loss: 0.7797855815714234, Validation Loss: 0.7797391980381335
Accuracy: 0.5033898305084745, Precision: 0.25340132145935074, Recall: 0.503389830508
4745, F1-score: 0.3371066057745591
```

```
Epoch 3/10 (Train): 100%|██████████| 1  
17/117 [00:07<00:00, 15.16sample/s]  
Epoch 3/10 (Eval): 100%|██████████| 1  
71/71 [00:02<00:00, 23.95sample/s]  
Epoch 3/10, Training Loss: 0.7796317368970496, Validation Loss: 0.7797300046109884  
Accuracy: 0.5033898305084745, Precision: 0.25340132145935074, Recall: 0.503389830508  
4745, F1-score: 0.3371066057745591  
Epoch 4/10 (Train): 100%|██████████| 1  
17/117 [00:08<00:00, 14.22sample/s]  
Epoch 4/10 (Eval): 100%|██████████| 1  
71/71 [00:02<00:00, 23.87sample/s]  
Epoch 00004: reducing learning rate of group 0 to 1.0000e-04.  
  
Epoch 4/10, Training Loss: 0.7798285931042402, Validation Loss: 0.7797202705326727  
Accuracy: 0.5033898305084745, Precision: 0.25340132145935074, Recall: 0.503389830508  
4745, F1-score: 0.3371066057745591  
Epoch 5/10 (Train): 100%|██████████| 1  
17/117 [00:08<00:00, 14.62sample/s]  
Epoch 5/10 (Eval): 100%|██████████| 1  
71/71 [00:02<00:00, 23.69sample/s]  
Epoch 5/10, Training Loss: 0.7800075752102732, Validation Loss: 0.7797201799470826  
Accuracy: 0.5033898305084745, Precision: 0.25340132145935074, Recall: 0.503389830508  
4745, F1-score: 0.3371066057745591  
Epoch 6/10 (Train): 100%|██████████| 1  
17/117 [00:08<00:00, 14.38sample/s]  
Epoch 6/10 (Eval): 100%|██████████| 1  
71/71 [00:02<00:00, 24.09sample/s]  
Epoch 6/10, Training Loss: 0.7797988199713788, Validation Loss: 0.7797203020187421  
Accuracy: 0.5033898305084745, Precision: 0.25340132145935074, Recall: 0.503389830508  
4745, F1-score: 0.3371066057745591  
Epoch 7/10 (Train): 100%|██████████| 1  
17/117 [00:07<00:00, 15.15sample/s]  
Epoch 7/10 (Eval): 100%|██████████| 1  
71/71 [00:02<00:00, 25.21sample/s]  
Epoch 00007: reducing learning rate of group 0 to 1.0000e-05.  
  
Epoch 7/10, Training Loss: 0.7798408128939074, Validation Loss: 0.7797196019167281  
Accuracy: 0.5033898305084745, Precision: 0.25340132145935074, Recall: 0.503389830508  
4745, F1-score: 0.3371066057745591  
Epoch 8/10 (Train): 100%|██████████| 1  
17/117 [00:08<00:00, 14.61sample/s]  
Epoch 8/10 (Eval): 100%|██████████| 1  
71/71 [00:03<00:00, 23.43sample/s]  
Epoch 8/10, Training Loss: 0.779847922494266, Validation Loss: 0.7797195653794176  
Accuracy: 0.5033898305084745, Precision: 0.25340132145935074, Recall: 0.503389830508  
4745, F1-score: 0.3371066057745591  
Epoch 9/10 (Train): 100%|██████████| 1  
17/117 [00:07<00:00, 15.27sample/s]  
Epoch 9/10 (Eval): 100%|██████████| 1  
71/71 [00:02<00:00, 25.32sample/s]  
Epoch 9/10, Training Loss: 0.7797744958632772, Validation Loss: 0.7797194529051161  
Accuracy: 0.5033898305084745, Precision: 0.25340132145935074, Recall: 0.503389830508  
4745, F1-score: 0.3371066057745591
```

```
Epoch 10/10 (Train): 100%|██████████| 1  
17/117 [00:07<00:00, 15.19sample/s]  
Epoch 10/10 (Eval): 100%|██████████| 1  
71/71 [00:02<00:00, 24.76sample/s]  
Epoch 00010: reducing learning rate of group 0 to 1.0000e-06.  
  
Epoch 10/10, Training Loss: 0.7797051409771378, Validation Loss: 0.7797194049183258  
Accuracy: 0.5033898305084745, Precision: 0.25340132145935074, Recall: 0.503389830508  
4745, F1-score: 0.3371066057745591  
Тренировка завершена!  
  
Test: 100%|██████████| 1  
72/72 [00:03<00:00, 19.70sample/s]  
Test Accuracy: 0.496098104793757  
Precision: 0.2461133295799575, Recall: 0.496098104793757, F1-score: 0.32900693984086  
715  
Accuracy of cats : 100 %  
Accuracy of dogs : 0 %  
  
Class_name: cats  
Train_count: 900  
Test_count: 300  
Valid_count: 300  
  
Shutil images: 100%|██████████| 150  
0/1500 [00:00<00:00, 1819.66image/s]  
Class_name: dogs  
Train_count: 900  
Test_count: 300  
Valid_count: 300  
  
Shutil images: 100%|██████████| 150  
0/1500 [00:00<00:00, 1856.37image/s]
```

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Выбранная модель: convnext\_tiny  
Пользовательское название модели: convnext\_tiny\_Exp4  
Выбранный оптимизатор: SGD

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```
Epoch 1/10 (Train): 100%|██████████| 1  
17/117 [00:09<00:00, 11.86sample/s]  
Epoch 1/10 (Eval): 100%|██████████| 1  
71/71 [00:03<00:00, 23.58sample/s]  
Epoch 1/10, Training Loss: 0.9228719096832524, Validation Loss: 0.7965814787789253  
Accuracy: 0.5677966101694916, Precision: 0.568242941534733, Recall: 0.56779661016949  
16, F1-score: 0.5664447091158956  
  
Epoch 2/10 (Train): 100%|██████████| 1  
17/117 [00:09<00:00, 12.20sample/s]  
Epoch 2/10 (Eval): 100%|██████████| 1  
71/71 [00:03<00:00, 23.03sample/s]  
Epoch 2/10, Training Loss: 0.846862689733015, Validation Loss: 0.789280262707317  
Accuracy: 0.5706214689265536, Precision: 0.5705968679124241, Recall: 0.5706214689265  
536, F1-score: 0.5704859964853951
```

Epoch 3/10 (Train): 100% | 1  
17/117 [00:09<00:00, 12.45sample/s]  
Epoch 3/10 (Eval): 100% |  
71/71 [00:03<00:00, 23.58sample/s]  
Epoch 3/10, Training Loss: 0.8285165374576433, Validation Loss: 0.7614365164506234  
Accuracy: 0.5790960451977402, Precision: 0.5791800582540544, Recall: 0.5790960451977402, F1-score: 0.5790846253880898

Epoch 4/10 (Train): 100% | 1  
17/117 [00:09<00:00, 12.43sample/s]  
Epoch 4/10 (Eval): 100% |  
71/71 [00:02<00:00, 23.88sample/s]  
Epoch 4/10, Training Loss: 0.8168501593708747, Validation Loss: 0.7452808717886606  
Accuracy: 0.5988700564971752, Precision: 0.5992223794388024, Recall: 0.5988700564971752, F1-score: 0.5987086823819728

Epoch 5/10 (Train): 100% | 1  
17/117 [00:09<00:00, 12.42sample/s]  
Epoch 5/10 (Eval): 100% |  
71/71 [00:02<00:00, 23.98sample/s]  
Epoch 5/10, Training Loss: 0.7879930176377051, Validation Loss: 0.7668869842243733  
Accuracy: 0.5740112994350283, Precision: 0.5740162965938702, Recall: 0.5740112994350283, F1-score: 0.5737761657816995

Epoch 6/10 (Train): 100% | 1  
17/117 [00:09<00:00, 12.51sample/s]  
Epoch 6/10 (Eval): 100% |  
71/71 [00:03<00:00, 23.60sample/s]  
Epoch 6/10, Training Loss: 0.794936619101525, Validation Loss: 0.7785108616459842  
Accuracy: 0.5649717514124294, Precision: 0.5653704312757756, Recall: 0.5649717514124294, F1-score: 0.5646827791781937

Epoch 7/10 (Train): 100% | 1  
17/117 [00:09<00:00, 12.25sample/s]  
Epoch 7/10 (Eval): 100% |  
71/71 [00:03<00:00, 23.49sample/s]  
Epoch 7/10, Training Loss: 0.7886794328771282, Validation Loss: 0.7385444617540823  
Accuracy: 0.5954802259887005, Precision: 0.5982154759094003, Recall: 0.5954802259887005, F1-score: 0.5932920082014673

Epoch 8/10 (Train): 100% | 1  
17/117 [00:09<00:00, 12.25sample/s]  
Epoch 8/10 (Eval): 100% |  
71/71 [00:03<00:00, 23.30sample/s]  
Epoch 8/10, Training Loss: 0.7932455197354553, Validation Loss: 0.7320069529242434  
Accuracy: 0.6067796610169491, Precision: 0.6068354433831382, Recall: 0.6067796610169491, F1-score: 0.6067796610169491

Epoch 9/10 (Train): 100% | 1  
17/117 [00:09<00:00, 12.51sample/s]  
Epoch 9/10 (Eval): 100% |  
71/71 [00:02<00:00, 23.85sample/s]  
Epoch 9/10, Training Loss: 0.7836749801454355, Validation Loss: 0.7639435400060341  
Accuracy: 0.5700564971751413, Precision: 0.5714977361525703, Recall: 0.5700564971751413, F1-score: 0.5686011407629193

Epoch 10/10 (Train): 100% | 1  
17/117 [00:09<00:00, 12.47sample/s]  
Epoch 10/10 (Eval): 100% |  
71/71 [00:02<00:00, 23.69sample/s]

```
Epoch 10/10, Training Loss: 0.7988857948837255, Validation Loss: 0.7398980423218786  
Accuracy: 0.5926553672316384, Precision: 0.5943753736382174, Recall: 0.5926553672316  
384, F1-score: 0.5901309595215157  
Тренировка завершена!
```

```
Test: 100%|██████████| 1  
72/72 [00:03<00:00, 20.07sample/s]  
Test Accuracy: 0.5964325529542921  
Precision: 0.5992597970292122, Recall: 0.5964325529542921, F1-score: 0.5942765377207  
821  
Accuracy of cats : 67 %  
Accuracy of dogs : 52 %  
  
Class_name: cats  
Train_count: 900  
Test_count: 300  
Valid_count: 300  
  
Shutil images: 100%|██████████| 150  
0/1500 [00:00<00:00, 1839.17image/s]  
Class_name: dogs  
Train_count: 900  
Test_count: 300  
Valid_count: 300  
  
Shutil images: 100%|██████████| 150  
0/1500 [00:00<00:00, 1833.69image/s]
```

---

```
-----  
Выбранная модель: densenet121  
Пользовательское название модели: densenet121_Exp4  
Выбранный оптимизатор: SGD
```

---

```
Epoch 1/10 (Train): 100%|██████████| 1  
17/117 [00:19<00:00, 6.15sample/s]  
Epoch 1/10 (Eval): 100%|██████████| 1  
71/71 [00:05<00:00, 14.13sample/s]  
Epoch 1/10, Training Loss: 0.7730617888419901, Validation Loss: 0.7496111305420008  
Accuracy: 0.5954802259887005, Precision: 0.601724253535256, Recall: 0.59548022598870  
05, F1-score: 0.5901509167575355  
  
Epoch 2/10 (Train): 100%|██████████| 1  
17/117 [00:19<00:00, 6.12sample/s]  
Epoch 2/10 (Eval): 100%|██████████| 1  
71/71 [00:05<00:00, 14.20sample/s]  
Epoch 2/10, Training Loss: 0.7464611356474097, Validation Loss: 0.7224622917714092  
Accuracy: 0.6463276836158192, Precision: 0.647217389428251, Recall: 0.64632768361581  
92, F1-score: 0.6459774458887585  
  
Epoch 3/10 (Train): 100%|██████████| 1  
17/117 [00:18<00:00, 6.20sample/s]  
Epoch 3/10 (Eval): 100%|██████████| 1  
71/71 [00:05<00:00, 13.97sample/s]
```

Epoch 3/10, Training Loss: 0.733722072296391, Validation Loss: 0.7101284487772797  
Accuracy: 0.655367231638418, Precision: 0.6554667248279141, Recall: 0.655367231638418, F1-score: 0.6552285480142843

Epoch 4/10 (Train): 100% | ██████████ | 1  
17/117 [00:19<00:00, 6.05sample/s]

Epoch 4/10 (Eval): 100% | ██████████ |  
71/71 [00:05<00:00, 13.70sample/s]

Epoch 4/10, Training Loss: 0.7283825937242357, Validation Loss: 0.6986859617596965  
Accuracy: 0.6615819209039548, Precision: 0.6730114302158144, Recall: 0.6615819209039548, F1-score: 0.6552951060985371

Epoch 5/10 (Train): 100% | ██████████ | 1  
17/117 [00:19<00:00, 6.06sample/s]

Epoch 5/10 (Eval): 100% | ██████████ |  
71/71 [00:05<00:00, 13.68sample/s]

Epoch 5/10, Training Loss: 0.7255005326027573, Validation Loss: 0.6938800159315605  
Accuracy: 0.6700564971751413, Precision: 0.6844292525229821, Recall: 0.6700564971751413, F1-score: 0.6628906403285414

Epoch 6/10 (Train): 100% | ██████████ | 1  
17/117 [00:19<00:00, 6.08sample/s]

Epoch 6/10 (Eval): 100% | ██████████ |  
71/71 [00:05<00:00, 13.82sample/s]

Epoch 6/10, Training Loss: 0.7187755601180589, Validation Loss: 0.6930461039314162  
Accuracy: 0.6610169491525424, Precision: 0.6899781531702894, Recall: 0.6610169491525424, F1-score: 0.6467094165652454

Epoch 7/10 (Train): 100% | ██████████ | 1  
17/117 [00:19<00:00, 6.00sample/s]

Epoch 7/10 (Eval): 100% | ██████████ |  
71/71 [00:05<00:00, 13.53sample/s]

Epoch 7/10, Training Loss: 0.7049831664668443, Validation Loss: 0.6762857912792324  
Accuracy: 0.6853107344632768, Precision: 0.6919192449226862, Recall: 0.6853107344632768, F1-score: 0.6822057027393758

Epoch 8/10 (Train): 100% | ██████████ | 1  
17/117 [00:19<00:00, 5.99sample/s]

Epoch 8/10 (Eval): 100% | ██████████ |  
71/71 [00:05<00:00, 13.50sample/s]

Epoch 8/10, Training Loss: 0.7084274304248112, Validation Loss: 0.6824089755109475  
Accuracy: 0.6700564971751413, Precision: 0.6986701954485387, Recall: 0.6700564971751413, F1-score: 0.6569333031203538

Epoch 9/10 (Train): 100% | ██████████ | 1  
17/117 [00:19<00:00, 5.97sample/s]

Epoch 9/10 (Eval): 100% | ██████████ |  
71/71 [00:05<00:00, 13.56sample/s]

Epoch 9/10, Training Loss: 0.691221164065816, Validation Loss: 0.6579191479305763  
Accuracy: 0.6892655367231638, Precision: 0.6892655367231638, Recall: 0.6892655367231638, F1-score: 0.6892655367231638

Epoch 10/10 (Train): 100% | ██████████ | 1  
17/117 [00:19<00:00, 5.98sample/s]

Epoch 10/10 (Eval): 100% | ██████████ |  
71/71 [00:05<00:00, 13.97sample/s]

Epoch 10/10, Training Loss: 0.692688052093762, Validation Loss: 0.6483338030718141  
Accuracy: 0.6988700564971752, Precision: 0.6988680034342563, Recall: 0.6988700564971752, F1-score: 0.698868068880432

Тренировка завершена!

```
Test: 100%|██████████| 1  
72/72 [00:05<00:00, 13.40sample/s]  
Test Accuracy: 0.705685618729097  
Precision: 0.7057531581496221, Recall: 0.705685618729097, F1-score: 0.70568781344539  
08  
Accuracy of cats : 71 %  
Accuracy of dogs : 70 %  
  
Class_name: cats  
Train_count: 900  
Test_count: 300  
Valid_count: 300  
  
Shutil images: 100%|██████████| 150  
0/1500 [00:00<00:00, 1815.84image/s]  
Class_name: dogs  
Train_count: 900  
Test_count: 300  
Valid_count: 300  
  
Shutil images: 100%|██████████| 150  
0/1500 [00:00<00:00, 1845.57image/s]
```

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Выбранная модель: densenet169  
Пользовательское название модели: densenet169\_Exp4  
Выбранный оптимизатор: SGD

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```
Epoch 1/10 (Train): 100%|██████████| 1  
17/117 [00:25<00:00, 4.59sample/s]  
Epoch 1/10 (Eval): 100%|██████████| 1  
71/71 [00:06<00:00, 11.41sample/s]  
Epoch 1/10, Training Loss: 0.799696193973523, Validation Loss: 0.762102083634522  
Accuracy: 0.5570621468926553, Precision: 0.5711804715778499, Recall: 0.5570621468926  
553, F1-score: 0.530860765682921  
  
Epoch 2/10 (Train): 100%|██████████| 1  
17/117 [00:25<00:00, 4.59sample/s]  
Epoch 2/10 (Eval): 100%|██████████| 1  
71/71 [00:06<00:00, 11.36sample/s]  
Epoch 2/10, Training Loss: 0.7579416374869343, Validation Loss: 0.7459789317543224  
Accuracy: 0.6016949152542372, Precision: 0.6029019946225798, Recall: 0.6016949152542  
372, F1-score: 0.6009046908114196  
  
Epoch 3/10 (Train): 100%|██████████| 1  
17/117 [00:25<00:00, 4.67sample/s]  
Epoch 3/10 (Eval): 100%|██████████| 1  
71/71 [00:06<00:00, 11.44sample/s]  
Epoch 3/10, Training Loss: 0.7629806659170991, Validation Loss: 0.731297225096805  
Accuracy: 0.6271186440677966, Precision: 0.6276405546054292, Recall: 0.6271186440677  
966, F1-score: 0.6265047309944534
```

```
Epoch 4/10 (Train): 100%|██████████| 1  
17/117 [00:25<00:00, 4.64sample/s]  
Epoch 4/10 (Eval): 100%|██████████|  
71/71 [00:06<00:00, 11.45sample/s]  
Epoch 4/10, Training Loss: 0.7412699135792754, Validation Loss: 0.7192691170563132  
Accuracy: 0.631638418079096, Precision: 0.6319776946217623, Recall: 0.631638418079096, F1-score: 0.631218784959675  
Epoch 5/10 (Train): 100%|██████████| 1  
17/117 [00:24<00:00, 4.75sample/s]  
Epoch 5/10 (Eval): 100%|██████████|  
71/71 [00:06<00:00, 11.46sample/s]  
Epoch 5/10, Training Loss: 0.7431505520185271, Validation Loss: 0.741195965621431  
Accuracy: 0.5915254237288136, Precision: 0.6502106224430158, Recall: 0.5915254237288136, F1-score: 0.5450747144037553  
Epoch 6/10 (Train): 100%|██████████| 1  
17/117 [00:24<00:00, 4.76sample/s]  
Epoch 6/10 (Eval): 100%|██████████|  
71/71 [00:06<00:00, 11.64sample/s]  
Epoch 6/10, Training Loss: 0.7369572667327133, Validation Loss: 0.7005003672198388  
Accuracy: 0.6587570621468927, Precision: 0.6629365925546323, Recall: 0.6587570621468927, F1-score: 0.6561565302483436  
Epoch 7/10 (Train): 100%|██████████| 1  
17/117 [00:24<00:00, 4.77sample/s]  
Epoch 7/10 (Eval): 100%|██████████|  
71/71 [00:06<00:00, 11.62sample/s]  
Epoch 7/10, Training Loss: 0.7185982333175771, Validation Loss: 0.6954427864928704  
Accuracy: 0.6531073446327683, Precision: 0.6588464300768311, Recall: 0.6531073446327683, F1-score: 0.6503972457627119  
Epoch 8/10 (Train): 100%|██████████| 1  
17/117 [00:24<00:00, 4.76sample/s]  
Epoch 8/10 (Eval): 100%|██████████|  
71/71 [00:06<00:00, 11.65sample/s]  
Epoch 8/10, Training Loss: 0.7163707253825101, Validation Loss: 0.6844359878766335  
Accuracy: 0.6700564971751413, Precision: 0.6923892836181322, Recall: 0.6700564971751413, F1-score: 0.6594666177206957  
Epoch 9/10 (Train): 100%|██████████| 1  
17/117 [00:25<00:00, 4.66sample/s]  
Epoch 9/10 (Eval): 100%|██████████|  
71/71 [00:06<00:00, 11.27sample/s]  
Epoch 9/10, Training Loss: 0.7133025520463935, Validation Loss: 0.6782011366159902  
Accuracy: 0.6711864406779661, Precision: 0.6716375691069436, Recall: 0.6711864406779661, F1-score: 0.6710688616398843  
Epoch 10/10 (Train): 100%|██████████| 1  
17/117 [00:25<00:00, 4.52sample/s]  
Epoch 10/10 (Eval): 100%|██████████|  
71/71 [00:06<00:00, 11.27sample/s]  
Epoch 10/10, Training Loss: 0.7265668775301588, Validation Loss: 0.6760563958162642  
Accuracy: 0.6830508474576271, Precision: 0.6863578533720507, Recall: 0.6830508474576271, F1-score: 0.6818924454861383  
Тренировка завершена!  
Test: 100%|██████████|  
72/72 [00:06<00:00, 10.86sample/s]
```

```
Test Accuracy: 0.6800445930880713
Precision: 0.6822084965961501, Recall: 0.6800445930880713, F1-score: 0.6788192917774
122
Accuracy of cats : 61 %
Accuracy of dogs : 74 %
```

```
Class_name: cats
Train_count: 900
Test_count: 300
Valid_count: 300
```

```
Shutil images: 100%|██████████| 150
0/1500 [00:00<00:00, 1845.06image/s]
```

```
Class_name: dogs
Train_count: 900
Test_count: 300
Valid_count: 300
```

```
Shutil images: 100%|██████████| 150
0/1500 [00:00<00:00, 1743.39image/s]
```

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```
-----
```

Выбранная модель: densenet201

Пользовательское название модели: densenet201\_Exp4

Выбранный оптимизатор: SGD

```
-----
```

```
Epoch 1/10 (Train): 100%|██████████| 1
17/117 [00:29<00:00, 3.98sample/s]
Epoch 1/10 (Eval): 100%|██████████| 1
71/71 [00:07<00:00, 10.01sample/s]
```

```
Epoch 1/10, Training Loss: 0.7984904138048353, Validation Loss: 0.7717779740101873
Accuracy: 0.5525423728813559, Precision: 0.595931382236653, Recall: 0.55254237288135
59, F1-score: 0.4992681550261885
```

```
Epoch 2/10 (Train): 100%|██████████| 1
17/117 [00:28<00:00, 4.04sample/s]
Epoch 2/10 (Eval): 100%|██████████| 1
71/71 [00:07<00:00, 10.10sample/s]
```

```
Epoch 2/10, Training Loss: 0.7760636770741591, Validation Loss: 0.7551147890629741
Accuracy: 0.5621468926553672, Precision: 0.6341697624738056, Recall: 0.562146892655
672, F1-score: 0.49098220813500626
```

```
Epoch 3/10 (Train): 100%|██████████| 1
17/117 [00:29<00:00, 4.03sample/s]
Epoch 3/10 (Eval): 100%|██████████| 1
71/71 [00:07<00:00, 9.90sample/s]
```

```
Epoch 3/10, Training Loss: 0.749527522580439, Validation Loss: 0.7299871431232172
Accuracy: 0.6062146892655367, Precision: 0.6210586038494685, Recall: 0.606214689265
5367, F1-score: 0.594981257673242
```

```
Epoch 4/10 (Train): 100%|██████████| 1
17/117 [00:28<00:00, 4.05sample/s]
Epoch 4/10 (Eval): 100%|██████████| 1
71/71 [00:06<00:00, 10.16sample/s]
```

Epoch 4/10, Training Loss: 0.7422617619947834, Validation Loss: 0.7112896854931352  
Accuracy: 0.6451977401129944, Precision: 0.6515439334948725, Recall: 0.6451977401129944, F1-score: 0.6408844532392669

Epoch 5/10 (Train): 100% | ██████████ | 1  
17/117 [00:28<00:00, 4.05sample/s]

Epoch 5/10 (Eval): 100% | ██████████ |  
71/71 [00:07<00:00, 10.14sample/s]

Epoch 5/10, Training Loss: 0.7356096765535837, Validation Loss: 0.7041709450005138  
Accuracy: 0.6666666666666666, Precision: 0.6671515151515153, Recall: 0.6666666666666666, F1-score: 0.6662869373101353

Epoch 6/10 (Train): 100% | ██████████ | 1  
17/117 [00:29<00:00, 4.01sample/s]

Epoch 6/10 (Eval): 100% | ██████████ |  
71/71 [00:07<00:00, 10.11sample/s]

Epoch 6/10, Training Loss: 0.7240406920069943, Validation Loss: 0.6905851892832309  
Accuracy: 0.6638418079096046, Precision: 0.6688683086124887, Recall: 0.6638418079096046, F1-score: 0.6616999923680041

Epoch 7/10 (Train): 100% | ██████████ | 1  
17/117 [00:28<00:00, 4.04sample/s]

Epoch 7/10 (Eval): 100% | ██████████ |  
71/71 [00:06<00:00, 10.15sample/s]

Epoch 7/10, Training Loss: 0.7185218633242549, Validation Loss: 0.6833903468766455  
Accuracy: 0.692090395480226, Precision: 0.6954652704728536, Recall: 0.692090395480226, F1-score: 0.6904997522571709

Epoch 8/10 (Train): 100% | ██████████ | 1  
17/117 [00:28<00:00, 4.06sample/s]

Epoch 8/10 (Eval): 100% | ██████████ |  
71/71 [00:06<00:00, 10.26sample/s]

Epoch 8/10, Training Loss: 0.720265725547112, Validation Loss: 0.6768892267666294  
Accuracy: 0.6932203389830508, Precision: 0.7004947940264066, Recall: 0.6932203389830508, F1-score: 0.6900517320620774

Epoch 9/10 (Train): 100% | ██████████ | 1  
17/117 [00:28<00:00, 4.10sample/s]

Epoch 9/10 (Eval): 100% | ██████████ |  
71/71 [00:07<00:00, 10.04sample/s]

Epoch 9/10, Training Loss: 0.7146959704761231, Validation Loss: 0.6722396009385923  
Accuracy: 0.6875706214689266, Precision: 0.6885527176187487, Recall: 0.6875706214689266, F1-score: 0.6870120870948199

Epoch 10/10 (Train): 100% | ██████████ | 1  
17/117 [00:28<00:00, 4.10sample/s]

Epoch 10/10 (Eval): 100% | ██████████ |  
71/71 [00:06<00:00, 10.20sample/s]

Epoch 10/10, Training Loss: 0.7067124310668974, Validation Loss: 0.6778177698958392  
Accuracy: 0.655367231638418, Precision: 0.6858782711614057, Recall: 0.655367231638418, F1-score: 0.64153272056126

Тренировка завершена!

Test: 100% | ██████████ |  
72/72 [00:07<00:00, 9.95sample/s]

```
Test Accuracy: 0.6677814938684504
Precision: 0.6942175041242894, Recall: 0.6677814938684504, F1-score: 0.6551620804435
377
Accuracy of cats : 47 %
Accuracy of dogs : 85 %
```

```
Class_name: cats
```

```
Train_count: 900
```

```
Test_count: 300
```

```
Valid_count: 300
```

```
Shutil images: 100%|██████████| 150
0/1500 [00:00<00:00, 1863.34image/s]
```

```
Class_name: dogs
```

```
Train_count: 900
```

```
Test_count: 300
```

```
Valid_count: 300
```

```
Shutil images: 100%|██████████| 150
0/1500 [00:00<00:00, 1877.57image/s]
```

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```
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```

Выбранная модель: efficientnet\_b0

Пользовательское название модели: efficientnet\_b0\_Exp4

Выбранный оптимизатор: AdamW

```
-----
```

```
Epoch 1/10 (Train): 100%|██████████| 1
17/117 [00:14<00:00, 8.01sample/s]
Epoch 1/10 (Eval): 100%|██████████| 1
71/71 [00:03<00:00, 20.20sample/s]
```

```
Epoch 1/10, Training Loss: 0.9143156784294892, Validation Loss: 0.7975543904102455
Accuracy: 0.503954802259887, Precision: 0.5082570534851474, Recall: 0.50395480225988
7, F1-score: 0.3564640598080325
```

```
Epoch 2/10 (Train): 100%|██████████| 1
17/117 [00:14<00:00, 8.07sample/s]
Epoch 2/10 (Eval): 100%|██████████| 1
71/71 [00:03<00:00, 20.05sample/s]
```

```
Epoch 2/10, Training Loss: 0.7835251204439677, Validation Loss: 0.760985804142925
Accuracy: 0.6062146892655367, Precision: 0.6088340530955715, Recall: 0.606214689265
367, F1-score: 0.6043711528512382
```

```
Epoch 3/10 (Train): 100%|██████████| 1
17/117 [00:14<00:00, 8.12sample/s]
Epoch 3/10 (Eval): 100%|██████████| 1
71/71 [00:03<00:00, 20.24sample/s]
```

```
Epoch 3/10, Training Loss: 0.7897805637942348, Validation Loss: 0.7507124558343725
Accuracy: 0.603954802259887, Precision: 0.6441978420863753, Recall: 0.60395480225988
7, F1-score: 0.5759887027814551
```

```
Epoch 4/10 (Train): 100%|██████████| 1
17/117 [00:14<00:00, 8.05sample/s]
Epoch 4/10 (Eval): 100%|██████████| 1
71/71 [00:03<00:00, 19.83sample/s]
```

Epoch 4/10, Training Loss: 0.7869535770581306, Validation Loss: 0.7205252795569641  
Accuracy: 0.6237288135593221, Precision: 0.6297232134932963, Recall: 0.6237288135593  
221, F1-score: 0.6199782238336536

Epoch 5/10 (Train): 100% | [██████████] | 1  
17/117 [00:14<00:00, 8.02sample/s]

Epoch 5/10 (Eval): 100% | [██████████] |  
71/71 [00:03<00:00, 19.96sample/s]

Epoch 5/10, Training Loss: 0.7588665019656959, Validation Loss: 1.1038722998678347  
Accuracy: 0.632768361581921, Precision: 0.6338013128132151, Recall: 0.63276836158192  
1, F1-score: 0.6322919457643756

Epoch 6/10 (Train): 100% | [██████████] | 1  
17/117 [00:14<00:00, 8.09sample/s]

Epoch 6/10 (Eval): 100% | [██████████] |  
71/71 [00:03<00:00, 20.06sample/s]

Epoch 6/10, Training Loss: 0.7738499239424143, Validation Loss: 1.0649092948369387  
Accuracy: 0.6084745762711864, Precision: 0.6111050837821038, Recall: 0.6084745762711  
864, F1-score: 0.605529838280843

Epoch 7/10 (Train): 100% | [██████████] | 1  
17/117 [00:14<00:00, 8.09sample/s]

Epoch 7/10 (Eval): 100% | [██████████] |  
71/71 [00:03<00:00, 19.96sample/s]

Epoch 00007: reducing learning rate of group 0 to 1.0000e-04.

Epoch 7/10, Training Loss: 0.7632751735086879, Validation Loss: 0.7781061339849806  
Accuracy: 0.655367231638418, Precision: 0.6698431071477785, Recall: 0.65536723163841  
8, F1-score: 0.6471521222487912

Epoch 8/10 (Train): 100% | [██████████] | 1  
17/117 [00:14<00:00, 8.02sample/s]

Epoch 8/10 (Eval): 100% | [██████████] |  
71/71 [00:03<00:00, 20.22sample/s]

Epoch 8/10, Training Loss: 0.7190776439543208, Validation Loss: 0.6784260901017377  
Accuracy: 0.7028248587570621, Precision: 0.7149461044281845, Recall: 0.7028248587570  
621, F1-score: 0.6981611990117058

Epoch 9/10 (Train): 100% | [██████████] | 1  
17/117 [00:14<00:00, 8.12sample/s]

Epoch 9/10 (Eval): 100% | [██████████] |  
71/71 [00:03<00:00, 20.24sample/s]

Epoch 9/10, Training Loss: 0.6990015333527323, Validation Loss: 0.6498478231793743  
Accuracy: 0.715819209039548, Precision: 0.7186734851638852, Recall: 0.71581920903954  
8, F1-score: 0.7146999641353242

Epoch 10/10 (Train): 100% | [██████████] | 1  
17/117 [00:14<00:00, 8.12sample/s]

Epoch 10/10 (Eval): 100% | [██████████] |  
71/71 [00:03<00:00, 19.78sample/s]

Epoch 10/10, Training Loss: 0.6995274097217609, Validation Loss: 0.6494959087695106  
Accuracy: 0.7305084745762712, Precision: 0.7418836854755112, Recall: 0.7305084745762  
712, F1-score: 0.7269881361016866

Тренировка завершена!

Test: 100% | [██████████] |  
72/72 [00:04<00:00, 17.87sample/s]

```
Test Accuracy: 0.717948717948718
Precision: 0.7275228944821551, Recall: 0.717948717948718, F1-score: 0.71530753673610
81
Accuracy of cats : 81 %
Accuracy of dogs : 62 %
```

```
Class_name: cats
```

```
Train_count: 900
```

```
Test_count: 300
```

```
Valid_count: 300
```

```
Shutil images: 100%|██████████| 150
0/1500 [00:00<00:00, 1681.54image/s]
```

```
Class_name: dogs
```

```
Train_count: 900
```

```
Test_count: 300
```

```
Valid_count: 300
```

```
Shutil images: 100%|██████████| 150
0/1500 [00:00<00:00, 1839.25image/s]
```

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```
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```

Выбранная модель: efficientnet\_b1

Пользовательское название модели: efficientnet\_b1\_Exp4

Выбранный оптимизатор: AdamW

```
-----
```

```
Epoch 1/10 (Train): 100%|██████████| 1
17/117 [00:18<00:00, 6.19sample/s]
Epoch 1/10 (Eval): 100%|██████████| 1
71/71 [00:04<00:00, 17.67sample/s]
```

```
Epoch 1/10, Training Loss: 0.9062403456612431, Validation Loss: 0.7905057390867654
Accuracy: 0.5016949152542373, Precision: 0.6738263559655956, Recall: 0.5016949152542
373, F1-score: 0.3426960992618048
```

```
Epoch 2/10 (Train): 100%|██████████| 1
17/117 [00:18<00:00, 6.17sample/s]
Epoch 2/10 (Eval): 100%|██████████| 1
71/71 [00:04<00:00, 17.52sample/s]
```

```
Epoch 2/10, Training Loss: 0.8152887195532579, Validation Loss: 0.8344274430961932
Accuracy: 0.5045197740112994, Precision: 0.5516631355932203, Recall: 0.5045197740112
994, F1-score: 0.3435625315103423
```

```
Epoch 3/10 (Train): 100%|██████████| 1
17/117 [00:18<00:00, 6.16sample/s]
Epoch 3/10 (Eval): 100%|██████████| 1
71/71 [00:04<00:00, 17.65sample/s]
```

```
Epoch 3/10, Training Loss: 0.8399524989807908, Validation Loss: 0.8695599165676677
Accuracy: 0.5028248587570622, Precision: 0.4980290322957972, Recall: 0.5028248587570
622, F1-score: 0.36810770220982625
```

```
Epoch 4/10 (Train): 100%|██████████| 1
17/117 [00:18<00:00, 6.22sample/s]
Epoch 4/10 (Eval): 100%|██████████| 1
71/71 [00:03<00:00, 17.78sample/s]
```

Epoch 00004: reducing learning rate of group 0 to 1.0000e-04.

Epoch 4/10, Training Loss: 0.8186440260505088, Validation Loss: 0.8832091963560568  
Accuracy: 0.5045197740112994, Precision: 0.5521113217339756, Recall: 0.5045197740112994, F1-score: 0.3709093307759471

Epoch 5/10 (Train): 100% | ██████████ | 1  
17/117 [00:18<00:00, 6.20sample/s]  
Epoch 5/10 (Eval): 100% | ██████████ |  
71/71 [00:04<00:00, 17.47sample/s]

Epoch 5/10, Training Loss: 0.7982244828819329, Validation Loss: 0.779959964886897  
Accuracy: 0.5169491525423728, Precision: 0.6088994520058011, Recall: 0.5169491525423728, F1-score: 0.3938035959074289

Epoch 6/10 (Train): 100% | ██████████ | 1  
17/117 [00:18<00:00, 6.18sample/s]  
Epoch 6/10 (Eval): 100% | ██████████ |  
71/71 [00:04<00:00, 17.69sample/s]

Epoch 6/10, Training Loss: 0.7872626763692533, Validation Loss: 0.7847204974478921  
Accuracy: 0.5101694915254237, Precision: 0.6225459203783996, Recall: 0.5101694915254237, F1-score: 0.37053250927528936

Epoch 7/10 (Train): 100% | ██████████ | 1  
17/117 [00:18<00:00, 6.24sample/s]  
Epoch 7/10 (Eval): 100% | ██████████ |  
71/71 [00:04<00:00, 17.53sample/s]

Epoch 7/10, Training Loss: 0.7891809960764675, Validation Loss: 0.7783689131844516  
Accuracy: 0.5288135593220339, Precision: 0.5553777146331507, Recall: 0.5288135593220339, F1-score: 0.4572361867701655

Epoch 8/10 (Train): 100% | ██████████ | 1  
17/117 [00:18<00:00, 6.22sample/s]  
Epoch 8/10 (Eval): 100% | ██████████ |  
71/71 [00:04<00:00, 17.40sample/s]

Epoch 8/10, Training Loss: 0.7868669949997934, Validation Loss: 0.774340138260254  
Accuracy: 0.5169491525423728, Precision: 0.5559876061886978, Recall: 0.5169491525423728, F1-score: 0.4048724149881879

Epoch 9/10 (Train): 100% | ██████████ | 1  
17/117 [00:18<00:00, 6.25sample/s]  
Epoch 9/10 (Eval): 100% | ██████████ |  
71/71 [00:03<00:00, 17.75sample/s]

Epoch 9/10, Training Loss: 0.7748404509037468, Validation Loss: 0.8061753696641006  
Accuracy: 0.5954802259887005, Precision: 0.6015341020176725, Recall: 0.5954802259887005, F1-score: 0.5882824495005861

Epoch 10/10 (Train): 100% | ██████████ | 1  
17/117 [00:18<00:00, 6.17sample/s]  
Epoch 10/10 (Eval): 100% | ██████████ |  
71/71 [00:04<00:00, 17.71sample/s]

Epoch 10/10, Training Loss: 0.7830105846143897, Validation Loss: 0.7697037845681616  
Accuracy: 0.6056497175141243, Precision: 0.6131409055734706, Recall: 0.6056497175141243, F1-score: 0.5980077679935701

Тренировка завершена!

Test: 100% | ██████████ |  
72/72 [00:04<00:00, 16.67sample/s]

```
Test Accuracy: 0.612597547380156
Precision: 0.62465946600979, Recall: 0.612597547380156, F1-score: 0.6041705230444578
Accuracy of cats : 76 %
Accuracy of dogs : 46 %

Class_name: cats
Train_count: 900
Test_count: 300
Valid_count: 300

Shutil images: 100%|██████████| 150
0/1500 [00:00<00:00, 1847.62image/s]

Class_name: dogs
Train_count: 900
Test_count: 300
Valid_count: 300

Shutil images: 100%|██████████| 150
0/1500 [00:00<00:00, 1829.67image/s]
```

Выбранная модель: efficientnet\_b2  
Пользовательское название модели: efficientnet\_b2\_Exp4  
Выбранный оптимизатор: AdamW

```
Epoch 1/10 (Train): 100%|██████████| 1  
17/117 [00:19<00:00, 6.16sample/s]  
Epoch 1/10 (Eval): 100%|██████████|  
71/71 [00:03<00:00, 17.90sample/s]  
Epoch 1/10, Training Loss: 0.9243827693424786, Validation Loss: 1.1374340838631667  
Accuracy: 0.5016949152542373, Precision: 0.48546545444118616, Recall: 0.501694915254  
2373, F1-score: 0.3571361194739346  
  
Epoch 2/10 (Train): 100%|██████████| 1  
17/117 [00:19<00:00, 6.11sample/s]  
Epoch 2/10 (Eval): 100%|██████████|  
71/71 [00:03<00:00, 17.77sample/s]  
Epoch 2/10, Training Loss: 0.8551657555281421, Validation Loss: 0.7964797573911269  
Accuracy: 0.5033898305084745, Precision: 0.5017239377757139, Recall: 0.5033898305084  
745, F1-score: 0.3459395648654354  
  
Epoch 3/10 (Train): 100%|██████████| 1  
17/117 [00:19<00:00, 6.09sample/s]  
Epoch 3/10 (Eval): 100%|██████████|  
71/71 [00:03<00:00, 17.84sample/s]  
Epoch 3/10, Training Loss: 0.821446811707564, Validation Loss: 0.7718756963304207  
Accuracy: 0.5305084745762711, Precision: 0.60938659510521, Recall: 0.530508474576271  
1, F1-score: 0.4323778170498819  
  
Epoch 4/10 (Train): 100%|██████████| 1  
17/117 [00:18<00:00, 6.21sample/s]  
Epoch 4/10 (Eval): 100%|██████████|  
71/71 [00:03<00:00, 17.81sample/s]
```

Epoch 4/10, Training Loss: 0.8240683583914212, Validation Loss: 0.7999730192672061  
Accuracy: 0.5146892655367231, Precision: 0.5903270208709996, Recall: 0.5146892655367231, F1-score: 0.37860926666656886

Epoch 5/10 (Train): 100% | ██████████ | 1  
17/117 [00:19<00:00, 6.13sample/s]

Epoch 5/10 (Eval): 100% | ██████████ |  
71/71 [00:04<00:00, 17.73sample/s]

Epoch 5/10, Training Loss: 0.8441560307416792, Validation Loss: 1.3076047030209148  
Accuracy: 0.48135593220338985, Precision: 0.4612111619260477, Recall: 0.48135593220338985, F1-score: 0.41334146888598877

Epoch 6/10 (Train): 100% | ██████████ | 1  
17/117 [00:18<00:00, 6.16sample/s]

Epoch 6/10 (Eval): 100% | ██████████ |  
71/71 [00:03<00:00, 17.86sample/s]

Epoch 6/10, Training Loss: 0.824655080572884, Validation Loss: 0.761694035119256  
Accuracy: 0.5932203389830508, Precision: 0.6163522503005109, Recall: 0.5932203389830508, F1-score: 0.5701228321721673

Epoch 7/10 (Train): 100% | ██████████ | 1  
17/117 [00:19<00:00, 6.14sample/s]

Epoch 7/10 (Eval): 100% | ██████████ |  
71/71 [00:03<00:00, 17.81sample/s]

Epoch 7/10, Training Loss: 0.7943830748303775, Validation Loss: 0.7980292739167725  
Accuracy: 0.631638418079096, Precision: 0.6488842763311794, Recall: 0.631638418079096, F1-score: 0.6196583100064597

Epoch 8/10 (Train): 100% | ██████████ | 1  
17/117 [00:19<00:00, 6.14sample/s]

Epoch 8/10 (Eval): 100% | ██████████ |  
71/71 [00:03<00:00, 17.81sample/s]

Epoch 8/10, Training Loss: 0.7767759533554336, Validation Loss: 0.7060757516804388  
Accuracy: 0.6497175141242938, Precision: 0.6554826533388765, Recall: 0.6497175141242938, F1-score: 0.6469096637675792

Epoch 9/10 (Train): 100% | ██████████ | 1  
17/117 [00:18<00:00, 6.23sample/s]

Epoch 9/10 (Eval): 100% | ██████████ |  
71/71 [00:04<00:00, 17.63sample/s]

Epoch 9/10, Training Loss: 0.7578334354471883, Validation Loss: 0.725034347361764  
Accuracy: 0.6649717514124294, Precision: 0.7010896303216334, Recall: 0.6649717514124294, F1-score: 0.6483116223562241

Epoch 10/10 (Train): 100% | ██████████ | 1  
17/117 [00:19<00:00, 6.10sample/s]

Epoch 10/10 (Eval): 100% | ██████████ |  
71/71 [00:03<00:00, 17.89sample/s]

Epoch 10/10, Training Loss: 0.7434037713828031, Validation Loss: 1.0035038665357956  
Accuracy: 0.635593220338983, Precision: 0.6595620609261685, Recall: 0.635593220338983, F1-score: 0.6203026165737826

Тренировка завершена!

Test: 100% | ██████████ |  
72/72 [00:04<00:00, 16.91sample/s]

```
Test Accuracy: 0.6415830546265329
Precision: 0.6682835139886615, Recall: 0.6415830546265329, F1-score: 0.6279283424545
168
Accuracy of cats : 83 %
Accuracy of dogs : 45 %
```

```
Class_name: cats
```

```
Train_count: 900
```

```
Test_count: 300
```

```
Valid_count: 300
```

```
Shutil images: 100%|██████████| 150
0/1500 [00:00<00:00, 1887.21image/s]
```

```
Class_name: dogs
```

```
Train_count: 900
```

```
Test_count: 300
```

```
Valid_count: 300
```

```
Shutil images: 100%|██████████| 150
0/1500 [00:00<00:00, 1881.70image/s]
```

---

```
-----
```

Выбранная модель: efficientnet\_b3

Пользовательское название модели: efficientnet\_b3\_Exp4

Выбранный оптимизатор: AdamW

```
-----
```

```
Epoch 1/10 (Train): 100%|██████████| 1
17/117 [00:21<00:00, 5.51sample/s]
Epoch 1/10 (Eval): 100%|██████████| 1
71/71 [00:04<00:00, 16.82sample/s]
```

```
Epoch 1/10, Training Loss: 0.9182629471286018, Validation Loss: 0.7816628578019007
Accuracy: 0.503954802259887, Precision: 0.53732810158779, Recall: 0.503954802259887,
F1-score: 0.341341765935156
```

```
Epoch 2/10 (Train): 100%|██████████| 1
17/117 [00:21<00:00, 5.55sample/s]
Epoch 2/10 (Eval): 100%|██████████| 1
71/71 [00:04<00:00, 17.02sample/s]
```

```
Epoch 2/10, Training Loss: 0.9125154902667032, Validation Loss: 6.073355712291211
Accuracy: 0.5056497175141242, Precision: 0.5151136878507957, Recall: 0.5056497175141
242, F1-score: 0.375416579732983
```

```
Epoch 3/10 (Train): 100%|██████████| 1
17/117 [00:20<00:00, 5.58sample/s]
Epoch 3/10 (Eval): 100%|██████████| 1
71/71 [00:04<00:00, 16.95sample/s]
```

```
Epoch 3/10, Training Loss: 0.8630570017409047, Validation Loss: 0.7886546122825752
Accuracy: 0.5033898305084745, Precision: 0.5017083365288748, Recall: 0.5033898305084
745, F1-score: 0.3381089121383465
```

```
Epoch 4/10 (Train): 100%|██████████| 1
17/117 [00:21<00:00, 5.54sample/s]
Epoch 4/10 (Eval): 100%|██████████| 1
71/71 [00:04<00:00, 17.05sample/s]
```

Epoch 00004: reducing learning rate of group 0 to 1.0000e-04.

Epoch 4/10, Training Loss: 0.8125835265338707, Validation Loss: 0.8096701800823212  
Accuracy: 0.5, Precision: 0.45948673587081895, Recall: 0.5, F1-score: 0.349957845433  
25525

Epoch 5/10 (Train): 100% | 1  
17/117 [00:20<00:00, 5.60sample/s]  
Epoch 5/10 (Eval): 100% |  
71/71 [00:04<00:00, 16.67sample/s]

Epoch 5/10, Training Loss: 0.7844477723607305, Validation Loss: 0.7993910290763877  
Accuracy: 0.5045197740112994, Precision: 0.5158268658078053, Recall: 0.5045197740112  
994, F1-score: 0.355833932706175

Epoch 6/10 (Train): 100% | 1  
17/117 [00:20<00:00, 5.59sample/s]  
Epoch 6/10 (Eval): 100% |  
71/71 [00:04<00:00, 17.00sample/s]

Epoch 6/10, Training Loss: 0.7828272430965392, Validation Loss: 0.8071145299127547  
Accuracy: 0.507909604519774, Precision: 0.5371893383658243, Recall: 0.50790960451977  
4, F1-score: 0.3699286045012591

Epoch 7/10 (Train): 100% | 1  
17/117 [00:21<00:00, 5.55sample/s]  
Epoch 7/10 (Eval): 100% |  
71/71 [00:04<00:00, 17.03sample/s]

Epoch 00007: reducing learning rate of group 0 to 1.0000e-05.

Epoch 7/10, Training Loss: 0.7661886029736974, Validation Loss: 0.7945576882631765  
Accuracy: 0.5610169491525424, Precision: 0.59667469183359, Recall: 0.561016949152542  
4, F1-score: 0.513042015393027

Epoch 8/10 (Train): 100% | 1  
17/117 [00:20<00:00, 5.60sample/s]  
Epoch 8/10 (Eval): 100% |  
71/71 [00:04<00:00, 17.01sample/s]

Epoch 8/10, Training Loss: 0.7731052535376048, Validation Loss: 0.7743802543750591  
Accuracy: 0.5700564971751413, Precision: 0.5984897012850551, Recall: 0.5700564971751  
413, F1-score: 0.5338271214404233

Epoch 9/10 (Train): 100% | 1  
17/117 [00:20<00:00, 5.59sample/s]  
Epoch 9/10 (Eval): 100% |  
71/71 [00:04<00:00, 17.07sample/s]

Epoch 9/10, Training Loss: 0.7770605499079327, Validation Loss: 0.7836107601553707  
Accuracy: 0.5480225988700564, Precision: 0.6043386405439273, Recall: 0.5480225988700  
564, F1-score: 0.4732604235243857

Epoch 10/10 (Train): 100% | 1  
17/117 [00:21<00:00, 5.57sample/s]  
Epoch 10/10 (Eval): 100% |  
71/71 [00:04<00:00, 16.97sample/s]

Epoch 10/10, Training Loss: 0.7750931748018598, Validation Loss: 0.7683082999145917  
Accuracy: 0.5570621468926553, Precision: 0.6026109393130546, Recall: 0.5570621468926  
553, F1-score: 0.4980970315627208

Тренировка завершена!

Test: 100% |  
72/72 [00:04<00:00, 15.34sample/s]

```
Test Accuracy: 0.5652173913043478
Precision: 0.6296003347637373, Recall: 0.5652173913043478, F1-score: 0.5070739914478
611
Accuracy of cats : 91 %
Accuracy of dogs : 22 %
```

```
Class_name: cats
Train_count: 900
Test_count: 300
Valid_count: 300
```

```
Shutil images: 100%|██████████| 150
0/1500 [00:00<00:00, 1858.21image/s]
```

```
Class_name: dogs
Train_count: 900
Test_count: 300
Valid_count: 300
```

```
Shutil images: 100%|██████████| 150
0/1500 [00:00<00:00, 1847.71image/s]
```

---

```
Выбранная модель: efficientnet_b4
```

```
Пользовательское название модели: efficientnet_b4_Exp4
```

```
Выбранный оптимизатор: AdamW
```

---

```
Epoch 1/10 (Train): 100%|██████████| 1
17/117 [00:25<00:00, 4.66sample/s]
```

```
Epoch 1/10 (Eval): 100%|██████████| 1
71/71 [00:04<00:00, 14.79sample/s]
```

```
Epoch 1/10, Training Loss: 0.9780655880346946, Validation Loss: 1.6611128799659385
Accuracy: 0.5033898305084745, Precision: 0.5017519367651108, Recall: 0.5033898305084
745, F1-score: 0.35887783664664114
```

```
Epoch 2/10 (Train): 100%|██████████| 1
17/117 [00:24<00:00, 4.70sample/s]
```

```
Epoch 2/10 (Eval): 100%|██████████| 1
71/71 [00:04<00:00, 14.83sample/s]
```

```
Epoch 2/10, Training Loss: 0.9048073427819323, Validation Loss: 2.157119084044365
Accuracy: 0.5112994350282486, Precision: 0.5452655970404328, Recall: 0.5112994350282
486, F1-score: 0.38495887466496553
```

```
Epoch 3/10 (Train): 100%|██████████| 1
17/117 [00:24<00:00, 4.70sample/s]
```

```
Epoch 3/10 (Eval): 100%|██████████| 1
71/71 [00:04<00:00, 15.02sample/s]
```

```
Epoch 3/10, Training Loss: 0.8613026292459698, Validation Loss: 2.6856072521479115
Accuracy: 0.5231638418079096, Precision: 0.5716106590185271, Recall: 0.5231638418079
096, F1-score: 0.41845276876973314
```

```
Epoch 4/10 (Train): 100%|██████████| 1
17/117 [00:24<00:00, 4.68sample/s]
```

```
Epoch 4/10 (Eval): 100%|██████████| 1
71/71 [00:04<00:00, 14.79sample/s]
```

Epoch 4/10, Training Loss: 0.8779511874754843, Validation Loss: 0.814086088184583  
Accuracy: 0.5067796610169492, Precision: 0.5120139650148504, Recall: 0.5067796610169492, F1-score: 0.4076803407339588

Epoch 5/10 (Train): 100% | ██████████ | 1  
17/117 [00:24<00:00, 4.75sample/s]  
Epoch 5/10 (Eval): 100% | ██████████ |  
71/71 [00:04<00:00, 14.93sample/s]

Epoch 5/10, Training Loss: 0.8643351580648899, Validation Loss: 0.8107300749269583  
Accuracy: 0.5067796610169492, Precision: 0.5292473533724548, Recall: 0.5067796610169492, F1-score: 0.3676217343432971

Epoch 6/10 (Train): 100% | ██████████ | 1  
17/117 [00:25<00:00, 4.68sample/s]  
Epoch 6/10 (Eval): 100% | ██████████ |  
71/71 [00:04<00:00, 14.98sample/s]

Epoch 6/10, Training Loss: 0.8452833848019182, Validation Loss: 1.6489306553608953  
Accuracy: 0.5265536723163842, Precision: 0.5264645858709242, Recall: 0.5265536723163842, F1-score: 0.5262663135051783

Epoch 7/10 (Train): 100% | ██████████ | 1  
17/117 [00:24<00:00, 4.73sample/s]  
Epoch 7/10 (Eval): 100% | ██████████ |  
71/71 [00:04<00:00, 14.93sample/s]

Epoch 7/10, Training Loss: 0.845060050630504, Validation Loss: 0.7840717507284239  
Accuracy: 0.4966101694915254, Precision: 0.2466216604424016, Recall: 0.4966101694915254, F1-score: 0.329573679866403

Epoch 8/10 (Train): 100% | ██████████ | 1  
17/117 [00:24<00:00, 4.74sample/s]  
Epoch 8/10 (Eval): 100% | ██████████ |  
71/71 [00:04<00:00, 14.71sample/s]

Epoch 8/10, Training Loss: 0.8210307889764157, Validation Loss: 0.786914057987558  
Accuracy: 0.5073446327683616, Precision: 0.5322549009896086, Recall: 0.5073446327683616, F1-score: 0.3696331144266755

Epoch 9/10 (Train): 100% | ██████████ | 1  
17/117 [00:24<00:00, 4.75sample/s]  
Epoch 9/10 (Eval): 100% | ██████████ |  
71/71 [00:04<00:00, 14.94sample/s]

Epoch 9/10, Training Loss: 0.8237938265060218, Validation Loss: 0.784946678216848  
Accuracy: 0.4977401129943503, Precision: 0.4949863304212819, Recall: 0.4977401129943503, F1-score: 0.4669636173032874

Epoch 10/10 (Train): 100% | ██████████ | 1  
17/117 [00:24<00:00, 4.73sample/s]  
Epoch 10/10 (Eval): 100% | ██████████ |  
71/71 [00:04<00:00, 14.70sample/s]

Epoch 00010: reducing learning rate of group 0 to 1.0000e-04.

Epoch 10/10, Training Loss: 0.8233976532858965, Validation Loss: 0.788033319226766  
Accuracy: 0.48983050847457626, Precision: 0.4425885246411124, Recall: 0.48983050847457626, F1-score: 0.34705678072501056

Тренировка завершена!

Test: 100% | ██████████ |  
72/72 [00:05<00:00, 13.75sample/s]

```
Test Accuracy: 0.5022296544035675
Precision: 0.48427703937916505, Recall: 0.5022296544035675, F1-score: 0.355685191743
5482
Accuracy of cats : 2 %
Accuracy of dogs : 97 %
```

```
Class_name: cats
```

```
Train_count: 900
```

```
Test_count: 300
```

```
Valid_count: 300
```

```
Shutil images: 100%|██████████| 150
0/1500 [00:00<00:00, 1847.13image/s]
```

```
Class_name: dogs
```

```
Train_count: 900
```

```
Test_count: 300
```

```
Valid_count: 300
```

```
Shutil images: 100%|██████████| 150
0/1500 [00:00<00:00, 1811.72image/s]
```

---

```
-----
```

Выбранная модель: efficientnet\_v2\_s

Пользовательское название модели: efficientnet\_v2\_s\_Exp4

Выбранный оптимизатор: AdamW

```
-----
```

```
Epoch 1/10 (Train): 100%|██████████| 1
17/117 [00:27<00:00, 4.29sample/s]
Epoch 1/10 (Eval): 100%|██████████| 1
71/71 [00:05<00:00, 13.74sample/s]
```

```
Epoch 1/10, Training Loss: 0.8797583227250738, Validation Loss: 1.0847187304900865
Accuracy: 0.4943502824858757, Precision: 0.463920619667793, Recall: 0.49435028248587
57, F1-score: 0.3747481011169264
```

```
Epoch 2/10 (Train): 100%|██████████| 1
17/117 [00:27<00:00, 4.32sample/s]
Epoch 2/10 (Eval): 100%|██████████| 1
71/71 [00:05<00:00, 13.62sample/s]
```

```
Epoch 2/10, Training Loss: 0.841824402847545, Validation Loss: 0.7837987823338158
Accuracy: 0.5163841807909605, Precision: 0.5739463190974189, Recall: 0.516384180790
605, F1-score: 0.4074616921911058
```

```
Epoch 3/10 (Train): 100%|██████████| 1
17/117 [00:26<00:00, 4.40sample/s]
Epoch 3/10 (Eval): 100%|██████████| 1
71/71 [00:05<00:00, 13.90sample/s]
```

```
Epoch 3/10, Training Loss: 0.8260153886020143, Validation Loss: 1.0617158771571467
Accuracy: 0.4937853107344633, Precision: 0.4471414867517265, Recall: 0.493785310734
4633, F1-score: 0.36167652082512153
```

```
Epoch 4/10 (Train): 100%|██████████| 1
17/117 [00:26<00:00, 4.39sample/s]
Epoch 4/10 (Eval): 100%|██████████| 1
71/71 [00:05<00:00, 13.88sample/s]
```

Epoch 4/10, Training Loss: 0.8514501057600958, Validation Loss: 0.8286539550218205  
Accuracy: 0.49548022598870056, Precision: 0.4328556218154884, Recall: 0.49548022598870056, F1-score: 0.3513610060378232

Epoch 5/10 (Train): 100% | ██████████ | 1  
17/117 [00:26<00:00, 4.39sample/s]  
Epoch 5/10 (Eval): 100% | ██████████ |  
71/71 [00:05<00:00, 13.74sample/s]

Epoch 5/10, Training Loss: 0.8237298134257321, Validation Loss: 0.7831953322820071  
Accuracy: 0.503954802259887, Precision: 0.5515148605175973, Recall: 0.503954802259887, F1-score: 0.3403537591581141

Epoch 6/10 (Train): 100% | ██████████ | 1  
17/117 [00:26<00:00, 4.34sample/s]  
Epoch 6/10 (Eval): 100% | ██████████ |  
71/71 [00:05<00:00, 13.91sample/s]

Epoch 6/10, Training Loss: 0.8417968249345495, Validation Loss: 0.9637161070680887  
Accuracy: 0.4847457627118644, Precision: 0.46125378391147337, Recall: 0.4847457627118644, F1-score: 0.3801905935972729

Epoch 7/10 (Train): 100% | ██████████ | 1  
17/117 [00:26<00:00, 4.39sample/s]  
Epoch 7/10 (Eval): 100% | ██████████ |  
71/71 [00:05<00:00, 14.04sample/s]

Epoch 7/10, Training Loss: 0.8167425107473866, Validation Loss: 0.9997593038162943  
Accuracy: 0.5033898305084745, Precision: 0.25340132145935074, Recall: 0.5033898305084745, F1-score: 0.3371066057745591

Epoch 8/10 (Train): 100% | ██████████ | 1  
17/117 [00:26<00:00, 4.34sample/s]  
Epoch 8/10 (Eval): 100% | ██████████ |  
71/71 [00:05<00:00, 13.88sample/s]

Epoch 00008: reducing learning rate of group 0 to 1.0000e-04.

Epoch 8/10, Training Loss: 0.8118155570043285, Validation Loss: 0.7926080346444232  
Accuracy: 0.5203389830508475, Precision: 0.5452877961777494, Recall: 0.5203389830508475, F1-score: 0.45270133352076153

Epoch 9/10 (Train): 100% | ██████████ | 1  
17/117 [00:26<00:00, 4.37sample/s]  
Epoch 9/10 (Eval): 100% | ██████████ |  
71/71 [00:05<00:00, 13.84sample/s]

Epoch 9/10, Training Loss: 0.7858888750373705, Validation Loss: 0.780321408631438  
Accuracy: 0.5225988700564972, Precision: 0.5307560307406344, Recall: 0.5225988700564972, F1-score: 0.49599685130364496

Epoch 10/10 (Train): 100% | ██████████ | 1  
17/117 [00:26<00:00, 4.38sample/s]  
Epoch 10/10 (Eval): 100% | ██████████ |  
71/71 [00:05<00:00, 13.85sample/s]

Epoch 10/10, Training Loss: 0.7844128092320672, Validation Loss: 0.7801664367233966  
Accuracy: 0.5361581920903955, Precision: 0.5579048818794582, Recall: 0.5361581920903955, F1-score: 0.49335600267006663

Тренировка завершена!

Test: 100% | ██████████ |  
72/72 [00:05<00:00, 13.42sample/s]

```
Test Accuracy: 0.5406911928651059
Precision: 0.5569285201064226, Recall: 0.5406911928651059, F1-score: 0.4996966686010
422
Accuracy of cats : 25 %
Accuracy of dogs : 82 %
```

```
Class_name: cats
```

```
Train_count: 900
```

```
Test_count: 300
```

```
Valid_count: 300
```

```
Shutil images: 100%|██████████| 150
0/1500 [00:00<00:00, 1824.30image/s]
```

```
Class_name: dogs
```

```
Train_count: 900
```

```
Test_count: 300
```

```
Valid_count: 300
```

```
Shutil images: 100%|██████████| 150
0/1500 [00:00<00:00, 1811.50image/s]
```

---

```
Выбранная модель: mnasnet0_5
```

```
Пользовательское название модели: mnasnet0_5_Exp4
```

```
Выбранный оптимизатор: AdamW
```

---

```
Epoch 1/10 (Train): 100%|██████████| 1
17/117 [00:11<00:00, 10.17sample/s]
Epoch 1/10 (Eval): 100%|██████████| 1
71/71 [00:03<00:00, 22.71sample/s]
```

```
Epoch 1/10, Training Loss: 0.9077123717096589, Validation Loss: 0.7803136926923094
Accuracy: 0.4966101694915254, Precision: 0.2466216604424016, Recall: 0.4966101694915
254, F1-score: 0.329573679866403
```

```
Epoch 2/10 (Train): 100%|██████████| 1
17/117 [00:11<00:00, 10.28sample/s]
Epoch 2/10 (Eval): 100%|██████████| 1
71/71 [00:03<00:00, 23.42sample/s]
```

```
Epoch 2/10, Training Loss: 0.8348892591153211, Validation Loss: 0.780333101973022
Accuracy: 0.4966101694915254, Precision: 0.2466216604424016, Recall: 0.4966101694915
254, F1-score: 0.329573679866403
```

```
Epoch 3/10 (Train): 100%|██████████| 1
17/117 [00:11<00:00, 10.23sample/s]
Epoch 3/10 (Eval): 100%|██████████| 1
71/71 [00:03<00:00, 23.41sample/s]
```

```
Epoch 3/10, Training Loss: 0.8486660463381827, Validation Loss: 0.7818902670326879
Accuracy: 0.4966101694915254, Precision: 0.2466216604424016, Recall: 0.4966101694915
254, F1-score: 0.329573679866403
```

```
Epoch 4/10 (Train): 100%|██████████| 1
17/117 [00:11<00:00, 10.25sample/s]
Epoch 4/10 (Eval): 100%|██████████| 1
71/71 [00:03<00:00, 23.19sample/s]
```

Epoch 00004: reducing learning rate of group 0 to 1.0000e-04.

Epoch 4/10, Training Loss: 0.8009098243680697, Validation Loss: 0.7821059550269175  
Accuracy: 0.4966101694915254, Precision: 0.2466216604424016, Recall: 0.4966101694915  
254, F1-score: 0.329573679866403

Epoch 5/10 (Train): 100% | 1  
17/117 [00:11<00:00, 10.18sample/s]  
Epoch 5/10 (Eval): 100% |  
71/71 [00:03<00:00, 23.41sample/s]

Epoch 5/10, Training Loss: 0.7590340712529654, Validation Loss: 0.7820689819626889  
Accuracy: 0.4966101694915254, Precision: 0.2466216604424016, Recall: 0.4966101694915  
254, F1-score: 0.329573679866403

Epoch 6/10 (Train): 100% | 1  
17/117 [00:11<00:00, 10.13sample/s]  
Epoch 6/10 (Eval): 100% |  
71/71 [00:03<00:00, 23.46sample/s]

Epoch 6/10, Training Loss: 0.7468715086017593, Validation Loss: 0.7825785383666303  
Accuracy: 0.4966101694915254, Precision: 0.2466216604424016, Recall: 0.4966101694915  
254, F1-score: 0.329573679866403

Epoch 7/10 (Train): 100% | 1  
17/117 [00:11<00:00, 10.33sample/s]  
Epoch 7/10 (Eval): 100% |  
71/71 [00:03<00:00, 23.42sample/s]

Epoch 00007: reducing learning rate of group 0 to 1.0000e-05.

Epoch 7/10, Training Loss: 0.739101299629218, Validation Loss: 0.7821286721418133  
Accuracy: 0.4966101694915254, Precision: 0.2466216604424016, Recall: 0.4966101694915  
254, F1-score: 0.329573679866403

Epoch 8/10 (Train): 100% | 1  
17/117 [00:11<00:00, 10.45sample/s]  
Epoch 8/10 (Eval): 100% |  
71/71 [00:03<00:00, 23.18sample/s]

Epoch 8/10, Training Loss: 0.7287895828791887, Validation Loss: 0.7823704141007979  
Accuracy: 0.4966101694915254, Precision: 0.2466216604424016, Recall: 0.4966101694915  
254, F1-score: 0.329573679866403

Epoch 9/10 (Train): 100% | 1  
17/117 [00:11<00:00, 10.37sample/s]  
Epoch 9/10 (Eval): 100% |  
71/71 [00:03<00:00, 22.89sample/s]

Epoch 9/10, Training Loss: 0.7314657138340108, Validation Loss: 0.7825948813204038  
Accuracy: 0.4966101694915254, Precision: 0.2466216604424016, Recall: 0.4966101694915  
254, F1-score: 0.329573679866403

Epoch 10/10 (Train): 100% | 1  
17/117 [00:11<00:00, 10.31sample/s]  
Epoch 10/10 (Eval): 100% |  
71/71 [00:03<00:00, 23.53sample/s]

Epoch 00010: reducing learning rate of group 0 to 1.0000e-06.

Epoch 10/10, Training Loss: 0.7377664586752551, Validation Loss: 0.7828767232302218  
Accuracy: 0.4966101694915254, Precision: 0.2466216604424016, Recall: 0.4966101694915  
254, F1-score: 0.329573679866403

Тренировка завершена!

Test: 100% |  
72/72 [00:03<00:00, 20.61sample/s]

```
Test Accuracy: 0.5039018952062431
Precision: 0.25391711999244354, Recall: 0.5039018952062431, F1-score: 0.337677771138
95014
Accuracy of cats : 0 %
Accuracy of dogs : 100 %
```

```
Class_name: cats
```

```
Train_count: 900
```

```
Test_count: 300
```

```
Valid_count: 300
```

```
Shutil images: 100%|██████████| 150
0/1500 [00:00<00:00, 1867.87image/s]
```

```
Class_name: dogs
```

```
Train_count: 900
```

```
Test_count: 300
```

```
Valid_count: 300
```

```
Shutil images: 100%|██████████| 150
0/1500 [00:00<00:00, 1811.61image/s]
```

---

```
-----
```

Выбранная модель: mnasnet0\_75

Пользовательское название модели: mnasnet0\_75\_Exp4

Выбранный оптимизатор: AdamW

```
-----
```

```
Epoch 1/10 (Train): 100%|██████████| 1
17/117 [00:11<00:00, 10.30sample/s]
```

```
Epoch 1/10 (Eval): 100%|██████████| 1
71/71 [00:03<00:00, 23.05sample/s]
```

```
Epoch 1/10, Training Loss: 0.9333866514148085, Validation Loss: 0.7797584402359138
Accuracy: 0.5033898305084745, Precision: 0.25340132145935074, Recall: 0.503389830508
4745, F1-score: 0.3371066057745591
```

```
Epoch 2/10 (Train): 100%|██████████| 1
17/117 [00:11<00:00, 10.34sample/s]
```

```
Epoch 2/10 (Eval): 100%|██████████| 1
71/71 [00:03<00:00, 22.96sample/s]
```

```
Epoch 2/10, Training Loss: 0.8451152845063056, Validation Loss: 0.7798207127778544
Accuracy: 0.5033898305084745, Precision: 0.25340132145935074, Recall: 0.503389830508
4745, F1-score: 0.3371066057745591
```

```
Epoch 3/10 (Train): 100%|██████████| 1
17/117 [00:11<00:00, 10.32sample/s]
```

```
Epoch 3/10 (Eval): 100%|██████████| 1
71/71 [00:03<00:00, 23.04sample/s]
```

```
Epoch 3/10, Training Loss: 0.8002920171796173, Validation Loss: 0.7797585777980459
Accuracy: 0.5033898305084745, Precision: 0.25340132145935074, Recall: 0.503389830508
4745, F1-score: 0.3371066057745591
```

```
Epoch 4/10 (Train): 100%|██████████| 1
17/117 [00:11<00:00, 10.14sample/s]
```

```
Epoch 4/10 (Eval): 100%|██████████| 1
71/71 [00:03<00:00, 23.21sample/s]
```

Epoch 00004: reducing learning rate of group 0 to 1.0000e-04.

Epoch 4/10, Training Loss: 0.8021445635902792, Validation Loss: 0.7803836163491179  
Accuracy: 0.5033898305084745, Precision: 0.25340132145935074, Recall: 0.5033898305084745, F1-score: 0.3371066057745591

Epoch 5/10 (Train): 100% | ██████████ | 1  
17/117 [00:11<00:00, 10.35sample/s]  
Epoch 5/10 (Eval): 100% | ██████████ |  
71/71 [00:03<00:00, 23.17sample/s]

Epoch 5/10, Training Loss: 0.7549560332110354, Validation Loss: 0.7812336993082768  
Accuracy: 0.5033898305084745, Precision: 0.25340132145935074, Recall: 0.5033898305084745, F1-score: 0.3371066057745591

Epoch 6/10 (Train): 100% | ██████████ | 1  
17/117 [00:11<00:00, 10.23sample/s]  
Epoch 6/10 (Eval): 100% | ██████████ |  
71/71 [00:03<00:00, 23.31sample/s]

Epoch 6/10, Training Loss: 0.7463640149241036, Validation Loss: 0.7814582567767235  
Accuracy: 0.5033898305084745, Precision: 0.25340132145935074, Recall: 0.5033898305084745, F1-score: 0.3371066057745591

Epoch 7/10 (Train): 100% | ██████████ | 1  
17/117 [00:11<00:00, 10.30sample/s]  
Epoch 7/10 (Eval): 100% | ██████████ |  
71/71 [00:03<00:00, 23.07sample/s]

Epoch 00007: reducing learning rate of group 0 to 1.0000e-05.

Epoch 7/10, Training Loss: 0.7326545507798381, Validation Loss: 0.781089225731327  
Accuracy: 0.5033898305084745, Precision: 0.25340132145935074, Recall: 0.5033898305084745, F1-score: 0.3371066057745591

Epoch 8/10 (Train): 100% | ██████████ | 1  
17/117 [00:11<00:00, 10.33sample/s]  
Epoch 8/10 (Eval): 100% | ██████████ |  
71/71 [00:03<00:00, 23.01sample/s]

Epoch 8/10, Training Loss: 0.7211707280750876, Validation Loss: 0.7821263546324045  
Accuracy: 0.5033898305084745, Precision: 0.25340132145935074, Recall: 0.5033898305084745, F1-score: 0.3371066057745591

Epoch 9/10 (Train): 100% | ██████████ | 1  
17/117 [00:11<00:00, 10.34sample/s]  
Epoch 9/10 (Eval): 100% | ██████████ |  
71/71 [00:03<00:00, 23.05sample/s]

Epoch 9/10, Training Loss: 0.7233144078784156, Validation Loss: 0.7830410598024811  
Accuracy: 0.5033898305084745, Precision: 0.25340132145935074, Recall: 0.5033898305084745, F1-score: 0.3371066057745591

Epoch 10/10 (Train): 100% | ██████████ | 1  
17/117 [00:11<00:00, 10.28sample/s]  
Epoch 10/10 (Eval): 100% | ██████████ |  
71/71 [00:03<00:00, 23.00sample/s]

Epoch 00010: reducing learning rate of group 0 to 1.0000e-06.

Epoch 10/10, Training Loss: 0.7205206442769869, Validation Loss: 0.7836008124095571  
Accuracy: 0.5033898305084745, Precision: 0.25340132145935074, Recall: 0.5033898305084745, F1-score: 0.3371066057745591

Тренировка завершена!

Test: 100% | ██████████ |  
72/72 [00:03<00:00, 19.64sample/s]

```
Test Accuracy: 0.496098104793757
Precision: 0.2461133295799575, Recall: 0.496098104793757, F1-score: 0.32900693984086
715
Accuracy of cats : 100 %
Accuracy of dogs : 0 %
```

```
Class_name: cats
```

```
Train_count: 900
```

```
Test_count: 300
```

```
Valid_count: 300
```

```
Shutil images: 100%|██████████| 150
0/1500 [00:00<00:00, 1836.49image/s]
```

```
Class_name: dogs
```

```
Train_count: 900
```

```
Test_count: 300
```

```
Valid_count: 300
```

```
Shutil images: 100%|██████████| 150
0/1500 [00:00<00:00, 1833.27image/s]
```

---

```
Выбранная модель: mnasnet1_0
```

```
Пользовательское название модели: mnasnet1_0_Exp4
```

```
Выбранный оптимизатор: AdamW
```

---

```
Epoch 1/10 (Train): 100%|██████████| 1
17/117 [00:11<00:00, 10.32sample/s]
Epoch 1/10 (Eval): 100%|██████████| 1
71/71 [00:03<00:00, 21.59sample/s]
```

```
Epoch 1/10, Training Loss: 0.876587830335821, Validation Loss: 0.7798474454610361
Accuracy: 0.4966101694915254, Precision: 0.2466216604424016, Recall: 0.4966101694915
254, F1-score: 0.329573679866403
```

```
Epoch 2/10 (Train): 100%|██████████| 1
17/117 [00:11<00:00, 10.35sample/s]
Epoch 2/10 (Eval): 100%|██████████| 1
71/71 [00:03<00:00, 22.15sample/s]
```

```
Epoch 2/10, Training Loss: 0.8201867670045477, Validation Loss: 0.7798966024555055
Accuracy: 0.5033898305084745, Precision: 0.25340132145935074, Recall: 0.503389830508
4745, F1-score: 0.3371066057745591
```

```
Epoch 3/10 (Train): 100%|██████████| 1
17/117 [00:11<00:00, 10.42sample/s]
Epoch 3/10 (Eval): 100%|██████████| 1
71/71 [00:03<00:00, 22.20sample/s]
```

```
Epoch 3/10, Training Loss: 0.7937356396804859, Validation Loss: 0.7809168019537198
Accuracy: 0.5033898305084745, Precision: 0.25340132145935074, Recall: 0.503389830508
4745, F1-score: 0.3371066057745591
```

```
Epoch 4/10 (Train): 100%|██████████| 1
17/117 [00:11<00:00, 10.40sample/s]
Epoch 4/10 (Eval): 100%|██████████| 1
71/71 [00:03<00:00, 22.36sample/s]
```

Epoch 00004: reducing learning rate of group 0 to 1.0000e-04.

Epoch 4/10, Training Loss: 0.7768963944675009, Validation Loss: 0.782093447480498  
Accuracy: 0.4966101694915254, Precision: 0.2466216604424016, Recall: 0.4966101694915  
254, F1-score: 0.329573679866403

Epoch 5/10 (Train): 100% | 1  
17/117 [00:11<00:00, 10.30sample/s]  
Epoch 5/10 (Eval): 100% |  
71/71 [00:03<00:00, 22.37sample/s]

Epoch 5/10, Training Loss: 0.714381155737301, Validation Loss: 0.7798011269273057  
Accuracy: 0.5033898305084745, Precision: 0.25340132145935074, Recall: 0.503389830508  
4745, F1-score: 0.3371066057745591

Epoch 6/10 (Train): 100% | 1  
17/117 [00:11<00:00, 10.30sample/s]  
Epoch 6/10 (Eval): 100% |  
71/71 [00:03<00:00, 22.50sample/s]

Epoch 6/10, Training Loss: 0.7071053634529819, Validation Loss: 0.7799138755111371  
Accuracy: 0.4966101694915254, Precision: 0.2466216604424016, Recall: 0.4966101694915  
254, F1-score: 0.329573679866403

Epoch 7/10 (Train): 100% | 1  
17/117 [00:11<00:00, 10.47sample/s]  
Epoch 7/10 (Eval): 100% |  
71/71 [00:03<00:00, 22.78sample/s]

Epoch 7/10, Training Loss: 0.6937726785296688, Validation Loss: 0.7797599648688472  
Accuracy: 0.5033898305084745, Precision: 0.25340132145935074, Recall: 0.503389830508  
4745, F1-score: 0.3371066057745591

Epoch 8/10 (Train): 100% | 1  
17/117 [00:11<00:00, 10.46sample/s]  
Epoch 8/10 (Eval): 100% |  
71/71 [00:03<00:00, 22.51sample/s]

Epoch 8/10, Training Loss: 0.6904483285768952, Validation Loss: 0.7797584205360736  
Accuracy: 0.5033898305084745, Precision: 0.25340132145935074, Recall: 0.503389830508  
4745, F1-score: 0.3371066057745591

Epoch 9/10 (Train): 100% | 1  
17/117 [00:11<00:00, 10.45sample/s]  
Epoch 9/10 (Eval): 100% |  
71/71 [00:03<00:00, 22.31sample/s]

Epoch 9/10, Training Loss: 0.6724738966242102, Validation Loss: 0.7800085670867208  
Accuracy: 0.4966101694915254, Precision: 0.2466216604424016, Recall: 0.4966101694915  
254, F1-score: 0.329573679866403

Epoch 10/10 (Train): 100% | 1  
17/117 [00:11<00:00, 10.21sample/s]  
Epoch 10/10 (Eval): 100% |  
71/71 [00:03<00:00, 22.06sample/s]

Epoch 00010: reducing learning rate of group 0 to 1.0000e-05.

Epoch 10/10, Training Loss: 0.6552127431095096, Validation Loss: 0.779878698331488  
Accuracy: 0.4966101694915254, Precision: 0.2466216604424016, Recall: 0.4966101694915  
254, F1-score: 0.329573679866403

Тренировка завершена!

Test: 100% |  
72/72 [00:03<00:00, 19.24sample/s]

```
Test Accuracy: 0.5039018952062431
Precision: 0.25391711999244354, Recall: 0.5039018952062431, F1-score: 0.337677771138
95014
Accuracy of cats : 0 %
Accuracy of dogs : 100 %
```

```
Class_name: cats
```

```
Train_count: 900
```

```
Test_count: 300
```

```
Valid_count: 300
```

```
Shutil images: 100%|██████████| 150
0/1500 [00:00<00:00, 1800.26image/s]
```

```
Class_name: dogs
```

```
Train_count: 900
```

```
Test_count: 300
```

```
Valid_count: 300
```

```
Shutil images: 100%|██████████| 150
0/1500 [00:00<00:00, 1811.74image/s]
```

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```
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```

Выбранная модель: mnasnet1\_3

Пользовательское название модели: mnasnet1\_3\_Exp4

Выбранный оптимизатор: AdamW

```
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```

```
Epoch 1/10 (Train): 100%|██████████| 1
17/117 [00:11<00:00, 10.24sample/s]
Epoch 1/10 (Eval): 100%|██████████| 1
71/71 [00:03<00:00, 21.21sample/s]
```

```
Epoch 1/10, Training Loss: 0.8835095853083259, Validation Loss: 0.7804842678840551
Accuracy: 0.5033898305084745, Precision: 0.25340132145935074, Recall: 0.503389830508
4745, F1-score: 0.3371066057745591
```

```
Epoch 2/10 (Train): 100%|██████████| 1
17/117 [00:11<00:00, 10.27sample/s]
Epoch 2/10 (Eval): 100%|██████████| 1
71/71 [00:03<00:00, 22.06sample/s]
```

```
Epoch 2/10, Training Loss: 0.8265827975508446, Validation Loss: 0.7892906515948517
Accuracy: 0.5033898305084745, Precision: 0.25340132145935074, Recall: 0.503389830508
4745, F1-score: 0.3371066057745591
```

```
Epoch 3/10 (Train): 100%|██████████| 1
17/117 [00:11<00:00, 10.17sample/s]
Epoch 3/10 (Eval): 100%|██████████| 1
71/71 [00:03<00:00, 21.21sample/s]
```

```
Epoch 3/10, Training Loss: 0.7919351874638126, Validation Loss: 0.7809129195698237
Accuracy: 0.5033898305084745, Precision: 0.25340132145935074, Recall: 0.503389830508
4745, F1-score: 0.3371066057745591
```

```
Epoch 4/10 (Train): 100%|██████████| 1
17/117 [00:11<00:00, 10.28sample/s]
Epoch 4/10 (Eval): 100%|██████████| 1
71/71 [00:03<00:00, 21.46sample/s]
```

Epoch 00004: reducing learning rate of group 0 to 1.0000e-04.

Epoch 4/10, Training Loss: 0.7629028297884158, Validation Loss: 0.7861360343499372  
Accuracy: 0.5033898305084745, Precision: 0.25340132145935074, Recall: 0.5033898305084745, F1-score: 0.3371066057745591

Epoch 5/10 (Train): 100% | 1  
17/117 [00:11<00:00, 10.24sample/s]  
Epoch 5/10 (Eval): 100% |  
71/71 [00:03<00:00, 21.29sample/s]

Epoch 5/10, Training Loss: 0.7013617556253633, Validation Loss: 0.7851417620303267  
Accuracy: 0.5033898305084745, Precision: 0.25340132145935074, Recall: 0.5033898305084745, F1-score: 0.3371066057745591

Epoch 6/10 (Train): 100% | 1  
17/117 [00:11<00:00, 10.27sample/s]  
Epoch 6/10 (Eval): 100% |  
71/71 [00:03<00:00, 21.14sample/s]

Epoch 6/10, Training Loss: 0.7024444350442959, Validation Loss: 0.7863762316393987  
Accuracy: 0.5033898305084745, Precision: 0.25340132145935074, Recall: 0.5033898305084745, F1-score: 0.3371066057745591

Epoch 7/10 (Train): 100% | 1  
17/117 [00:11<00:00, 10.23sample/s]  
Epoch 7/10 (Eval): 100% |  
71/71 [00:03<00:00, 21.13sample/s]

Epoch 00007: reducing learning rate of group 0 to 1.0000e-05.

Epoch 7/10, Training Loss: 0.664923411769112, Validation Loss: 0.7894675511088075  
Accuracy: 0.5033898305084745, Precision: 0.25340132145935074, Recall: 0.5033898305084745, F1-score: 0.3371066057745591

Epoch 8/10 (Train): 100% | 1  
17/117 [00:11<00:00, 10.07sample/s]  
Epoch 8/10 (Eval): 100% |  
71/71 [00:03<00:00, 21.30sample/s]

Epoch 8/10, Training Loss: 0.6662241308206234, Validation Loss: 0.7880828434464622  
Accuracy: 0.5033898305084745, Precision: 0.25340132145935074, Recall: 0.5033898305084745, F1-score: 0.3371066057745591

Epoch 9/10 (Train): 100% | 1  
17/117 [00:11<00:00, 10.26sample/s]  
Epoch 9/10 (Eval): 100% |  
71/71 [00:03<00:00, 21.43sample/s]

Epoch 9/10, Training Loss: 0.6492712734046253, Validation Loss: 0.7881960784648098  
Accuracy: 0.5033898305084745, Precision: 0.25340132145935074, Recall: 0.5033898305084745, F1-score: 0.3371066057745591

Epoch 10/10 (Train): 100% | 1  
17/117 [00:11<00:00, 10.31sample/s]  
Epoch 10/10 (Eval): 100% |  
71/71 [00:03<00:00, 21.33sample/s]

Epoch 00010: reducing learning rate of group 0 to 1.0000e-06.

Epoch 10/10, Training Loss: 0.63009977055748, Validation Loss: 0.7887014724777244  
Accuracy: 0.5033898305084745, Precision: 0.25340132145935074, Recall: 0.5033898305084745, F1-score: 0.3371066057745591

Тренировка завершена!

Test: 100% |  
72/72 [00:03<00:00, 18.14sample/s]

```
Test Accuracy: 0.496098104793757
Precision: 0.2461133295799575, Recall: 0.496098104793757, F1-score: 0.32900693984086
715
Accuracy of cats : 100 %
Accuracy of dogs : 0 %
```

```
Class_name: cats
```

```
Train_count: 900
```

```
Test_count: 300
```

```
Valid_count: 300
```

```
Shutil images: 100%|██████████| 150
0/1500 [00:00<00:00, 1861.18image/s]
```

```
Class_name: dogs
```

```
Train_count: 900
```

```
Test_count: 300
```

```
Valid_count: 300
```

```
Shutil images: 100%|██████████| 150
0/1500 [00:00<00:00, 1869.41image/s]
```

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```
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```

Выбранная модель: mobilenet\_v2

Пользовательское название модели: mobilenet\_v2\_Exp4

Выбранный оптимизатор: AdamW

```
-----
```

```
Epoch 1/10 (Train): 100%|██████████| 1
17/117 [00:11<00:00, 10.19sample/s]
Epoch 1/10 (Eval): 100%|██████████| 1
71/71 [00:03<00:00, 21.26sample/s]
```

```
Epoch 1/10, Training Loss: 0.9188247506057996, Validation Loss: 0.7973849938414191
Accuracy: 0.5372881355932203, Precision: 0.5419719298949819, Recall: 0.5372881355932
03, F1-score: 0.5271794295658142
```

```
Epoch 2/10 (Train): 100%|██████████| 1
17/117 [00:11<00:00, 10.22sample/s]
Epoch 2/10 (Eval): 100%|██████████| 1
71/71 [00:03<00:00, 21.19sample/s]
```

```
Epoch 2/10, Training Loss: 0.8508754801962619, Validation Loss: 0.7606097288050894
Accuracy: 0.559322033898305, Precision: 0.5646129734090743, Recall: 0.55932203389830
5, F1-score: 0.548003741196518
```

```
Epoch 3/10 (Train): 100%|██████████| 1
17/117 [00:11<00:00, 10.18sample/s]
Epoch 3/10 (Eval): 100%|██████████| 1
71/71 [00:03<00:00, 21.71sample/s]
```

```
Epoch 3/10, Training Loss: 0.8111040358309717, Validation Loss: 0.7386683358647729
Accuracy: 0.5949152542372881, Precision: 0.6052848778473279, Recall: 0.5949152542372
881, F1-score: 0.5859252546723599
```

```
Epoch 4/10 (Train): 100%|██████████| 1
17/117 [00:11<00:00, 10.22sample/s]
Epoch 4/10 (Eval): 100%|██████████| 1
71/71 [00:03<00:00, 21.29sample/s]
```

```
Epoch 4/10, Training Loss: 0.7781362592397773, Validation Loss: 0.716819156361165
Accuracy: 0.6440677966101694, Precision: 0.6486173921107614, Recall: 0.6440677966101
694, F1-score: 0.6408340767172168
Epoch 5/10 (Train): 100%|██████████| 1
17/117 [00:11<00:00, 10.10sample/s]
Epoch 5/10 (Eval): 100%|██████████| 1
71/71 [00:03<00:00, 20.88sample/s]
Epoch 5/10, Training Loss: 0.7602416809860201, Validation Loss: 0.6914804288222964
Accuracy: 0.6632768361581921, Precision: 0.6717289566726821, Recall: 0.6632768361581
921, F1-score: 0.658561779935093
Epoch 6/10 (Train): 100%|██████████| 1
17/117 [00:11<00:00, 10.12sample/s]
Epoch 6/10 (Eval): 100%|██████████| 1
71/71 [00:03<00:00, 21.89sample/s]
Epoch 6/10, Training Loss: 0.7662835067841515, Validation Loss: 0.7118956308580388
Accuracy: 0.688135593220339, Precision: 0.6884236631305013, Recall: 0.68813559322033
9, F1-score: 0.688081833381899
Epoch 7/10 (Train): 100%|██████████| 1
17/117 [00:11<00:00, 10.18sample/s]
Epoch 7/10 (Eval): 100%|██████████| 1
71/71 [00:03<00:00, 21.26sample/s]
Epoch 7/10, Training Loss: 0.759431854043618, Validation Loss: 0.7331884312259276
Accuracy: 0.5141242937853108, Precision: 0.6142341749747056, Recall: 0.5141242937853
108, F1-score: 0.3714233809263255
Epoch 8/10 (Train): 100%|██████████| 1
17/117 [00:11<00:00, 10.09sample/s]
Epoch 8/10 (Eval): 100%|██████████| 1
71/71 [00:03<00:00, 21.83sample/s]
Epoch 00008: reducing learning rate of group 0 to 1.0000e-04.

Epoch 8/10, Training Loss: 0.7300360815891915, Validation Loss: 0.8777326441417306
Accuracy: 0.5033898305084745, Precision: 0.25340132145935074, Recall: 0.503389830508
4745, F1-score: 0.3371066057745591
Epoch 9/10 (Train): 100%|██████████| 1
17/117 [00:11<00:00, 10.02sample/s]
Epoch 9/10 (Eval): 100%|██████████| 1
71/71 [00:03<00:00, 21.37sample/s]
Epoch 9/10, Training Loss: 0.7064430647880104, Validation Loss: 0.6366559645045275
Accuracy: 0.7141242937853107, Precision: 0.7206546415120599, Recall: 0.7141242937853
107, F1-score: 0.7117110852867509
Epoch 10/10 (Train): 100%|██████████| 1
17/117 [00:11<00:00, 10.20sample/s]
Epoch 10/10 (Eval): 100%|██████████| 1
71/71 [00:03<00:00, 21.36sample/s]
Epoch 10/10, Training Loss: 0.6635710677927369, Validation Loss: 0.6046775754562206
Accuracy: 0.7333333333333333, Precision: 0.7333426993916745, Recall: 0.733333333333
333, F1-score: 0.7333146044458974
Тренировка завершена!
Test: 100%|██████████| 1
72/72 [00:03<00:00, 18.43sample/s]
```

```
Test Accuracy: 0.7363433667781494
Precision: 0.7363878037137912, Recall: 0.7363433667781494, F1-score: 0.7363470532397
279
Accuracy of cats : 73 %
Accuracy of dogs : 73 %
```

```
Class_name: cats
Train_count: 900
Test_count: 300
Valid_count: 300
```

```
Shutil images: 100%|██████████| 150
0/1500 [00:00<00:00, 1849.98image/s]
```

```
Class_name: dogs
Train_count: 900
Test_count: 300
Valid_count: 300
```

```
Shutil images: 100%|██████████| 150
0/1500 [00:00<00:00, 1810.03image/s]
```

---

```
-----  
Выбранная модель: mobilenet_v3_large  
Пользовательское название модели: mobilenet_v3_large_Exp4  
Выбранный оптимизатор: AdamW
```

---

```
Epoch 1/10 (Train): 100%|██████████| 1
17/117 [00:12<00:00, 9.23sample/s]
Epoch 1/10 (Eval): 100%|██████████| 1
71/71 [00:03<00:00, 21.43sample/s]
```

```
Epoch 1/10, Training Loss: 0.8458104862220652, Validation Loss: 0.7879905148414569
Accuracy: 0.4966101694915254, Precision: 0.2466216604424016, Recall: 0.4966101694915
254, F1-score: 0.329573679866403
```

```
Epoch 2/10 (Train): 100%|██████████| 1
17/117 [00:12<00:00, 9.22sample/s]
Epoch 2/10 (Eval): 100%|██████████| 1
71/71 [00:03<00:00, 21.52sample/s]
```

```
Epoch 2/10, Training Loss: 0.786070786411424, Validation Loss: 0.7827675244902487
Accuracy: 0.5033898305084745, Precision: 0.25340132145935074, Recall: 0.503389830508
4745, F1-score: 0.3371066057745591
```

```
Epoch 3/10 (Train): 100%|██████████| 1
17/117 [00:12<00:00, 9.09sample/s]
Epoch 3/10 (Eval): 100%|██████████| 1
71/71 [00:03<00:00, 21.38sample/s]
```

```
Epoch 3/10, Training Loss: 0.7889468109795621, Validation Loss: 0.7811159533632677
Accuracy: 0.5033898305084745, Precision: 0.25340132145935074, Recall: 0.503389830508
4745, F1-score: 0.3371066057745591
```

```
Epoch 4/10 (Train): 100%|██████████| 1
17/117 [00:12<00:00, 9.21sample/s]
Epoch 4/10 (Eval): 100%|██████████| 1
71/71 [00:03<00:00, 22.04sample/s]
```

Epoch 4/10, Training Loss: 0.7873870264062169, Validation Loss: 0.7798350392761877  
Accuracy: 0.5033898305084745, Precision: 0.25340132145935074, Recall: 0.5033898305084745, F1-score: 0.3371066057745591

Epoch 5/10 (Train): 100% | ██████████ | 1  
17/117 [00:12<00:00, 9.28sample/s]

Epoch 5/10 (Eval): 100% | ██████████ |  
71/71 [00:03<00:00, 21.67sample/s]

Epoch 5/10, Training Loss: 0.7854235609603958, Validation Loss: 0.7888698367412481  
Accuracy: 0.4887005649717514, Precision: 0.44406497175141235, Recall: 0.4887005649717514, F1-score: 0.370831099644659

Epoch 6/10 (Train): 100% | ██████████ | 1  
17/117 [00:12<00:00, 9.16sample/s]

Epoch 6/10 (Eval): 100% | ██████████ |  
71/71 [00:03<00:00, 21.39sample/s]

Epoch 6/10, Training Loss: 0.7814208161471395, Validation Loss: 0.7695773632849677  
Accuracy: 0.5875706214689266, Precision: 0.6168185036684333, Recall: 0.5875706214689266, F1-score: 0.5579236958749924

Epoch 7/10 (Train): 100% | ██████████ | 1  
17/117 [00:12<00:00, 9.24sample/s]

Epoch 7/10 (Eval): 100% | ██████████ |  
71/71 [00:03<00:00, 21.18sample/s]

Epoch 7/10, Training Loss: 0.7536915148505615, Validation Loss: 0.7550021910061271  
Accuracy: 0.6344632768361582, Precision: 0.6388385438921332, Recall: 0.6344632768361582, F1-score: 0.6310213114579677

Epoch 8/10 (Train): 100% | ██████████ | 1  
17/117 [00:12<00:00, 9.35sample/s]

Epoch 8/10 (Eval): 100% | ██████████ |  
71/71 [00:03<00:00, 21.79sample/s]

Epoch 8/10, Training Loss: 0.7369251448132552, Validation Loss: 0.7301967209678585  
Accuracy: 0.6107344632768361, Precision: 0.6139533165020258, Recall: 0.6107344632768361, F1-score: 0.6085297121033384

Epoch 9/10 (Train): 100% | ██████████ | 1  
17/117 [00:12<00:00, 9.27sample/s]

Epoch 9/10 (Eval): 100% | ██████████ |  
71/71 [00:03<00:00, 21.77sample/s]

Epoch 9/10, Training Loss: 0.7307344875039917, Validation Loss: 0.761792996256365  
Accuracy: 0.615819209039548, Precision: 0.6389720768688422, Recall: 0.615819209039548, F1-score: 0.6003971311174701

Epoch 10/10 (Train): 100% | ██████████ | 1  
17/117 [00:12<00:00, 9.18sample/s]

Epoch 10/10 (Eval): 100% | ██████████ |  
71/71 [00:03<00:00, 21.24sample/s]

Epoch 10/10, Training Loss: 0.7288619588710741, Validation Loss: 0.7059009029703626  
Accuracy: 0.6451977401129944, Precision: 0.6453262862680302, Recall: 0.6451977401129944, F1-score: 0.6451796196746497

Тренировка завершена!

Test: 100% | ██████████ |  
72/72 [00:03<00:00, 18.74sample/s]

```
Test Accuracy: 0.6354515050167224
Precision: 0.6354415109164012, Recall: 0.6354515050167224, F1-score: 0.6354433488395
481
Accuracy of cats : 63 %
Accuracy of dogs : 64 %
```

```
Class_name: cats
```

```
Train_count: 900
```

```
Test_count: 300
```

```
Valid_count: 300
```

```
Shutil images: 100%|██████████| 150
0/1500 [00:00<00:00, 1826.45image/s]
```

```
Class_name: dogs
```

```
Train_count: 900
```

```
Test_count: 300
```

```
Valid_count: 300
```

```
Shutil images: 100%|██████████| 150
0/1500 [00:00<00:00, 1752.57image/s]
```

---

```
-----
```

Выбранная модель: mobilenet\_v3\_small

Пользовательское название модели: mobilenet\_v3\_small\_Exp4

Выбранный оптимизатор: AdamW

```
-----
```

```
Epoch 1/10 (Train): 100%|██████████| 1
17/117 [00:11<00:00, 9.90sample/s]
Epoch 1/10 (Eval): 100%|██████████| 1
71/71 [00:03<00:00, 22.03sample/s]
```

```
Epoch 1/10, Training Loss: 0.8017121222919598, Validation Loss: 0.7801743015057623
Accuracy: 0.5033898305084745, Precision: 0.25340132145935074, Recall: 0.503389830508
4745, F1-score: 0.3371066057745591
```

```
Epoch 2/10 (Train): 100%|██████████| 1
17/117 [00:11<00:00, 10.32sample/s]
Epoch 2/10 (Eval): 100%|██████████| 1
71/71 [00:03<00:00, 21.78sample/s]
```

```
Epoch 2/10, Training Loss: 0.760504745207395, Validation Loss: 0.7809639030930686
Accuracy: 0.5033898305084745, Precision: 0.25340132145935074, Recall: 0.503389830508
4745, F1-score: 0.3371066057745591
```

```
Epoch 3/10 (Train): 100%|██████████| 1
17/117 [00:11<00:00, 10.13sample/s]
Epoch 3/10 (Eval): 100%|██████████| 1
71/71 [00:03<00:00, 22.72sample/s]
```

```
Epoch 3/10, Training Loss: 0.7701325194936979, Validation Loss: 0.7801942954965904
Accuracy: 0.5033898305084745, Precision: 0.25340132145935074, Recall: 0.503389830508
4745, F1-score: 0.3371066057745591
```

```
Epoch 4/10 (Train): 100%|██████████| 1
17/117 [00:11<00:00, 10.41sample/s]
Epoch 4/10 (Eval): 100%|██████████| 1
71/71 [00:03<00:00, 22.40sample/s]
```

Epoch 4/10, Training Loss: 0.7548686255527899, Validation Loss: 0.7762775611405992  
Accuracy: 0.5480225988700564, Precision: 0.5663186440677966, Recall: 0.5480225988700564, F1-score: 0.5104376100638354

Epoch 5/10 (Train): 100% | ██████████ | 1  
17/117 [00:11<00:00, 10.53sample/s]

Epoch 5/10 (Eval): 100% | ██████████ |  
71/71 [00:03<00:00, 23.00sample/s]

Epoch 5/10, Training Loss: 0.7557353644112841, Validation Loss: 0.7811131777062927  
Accuracy: 0.4971751412429379, Precision: 0.48339983923148955, Recall: 0.4971751412429379, F1-score: 0.39648174507594625

Epoch 6/10 (Train): 100% | ██████████ | 1  
17/117 [00:11<00:00, 10.39sample/s]

Epoch 6/10 (Eval): 100% | ██████████ |  
71/71 [00:03<00:00, 21.49sample/s]

Epoch 6/10, Training Loss: 0.7510778591435114, Validation Loss: 0.7975448777446639  
Accuracy: 0.63954802259887, Precision: 0.6442963758028853, Recall: 0.63954802259887, F1-score: 0.6360324387263947

Epoch 7/10 (Train): 100% | ██████████ | 1  
17/117 [00:11<00:00, 10.18sample/s]

Epoch 7/10 (Eval): 100% | ██████████ |  
71/71 [00:03<00:00, 22.10sample/s]

Epoch 7/10, Training Loss: 0.7322223633425623, Validation Loss: 0.7115084938915436  
Accuracy: 0.6163841807909605, Precision: 0.6204911225343331, Recall: 0.6163841807909605, F1-score: 0.6124219632967781

Epoch 8/10 (Train): 100% | ██████████ | 1  
17/117 [00:11<00:00, 10.30sample/s]

Epoch 8/10 (Eval): 100% | ██████████ |  
71/71 [00:03<00:00, 22.54sample/s]

Epoch 8/10, Training Loss: 0.7171346404276293, Validation Loss: 0.7330422993265303  
Accuracy: 0.5994350282485875, Precision: 0.6003005629487329, Recall: 0.5994350282485875, F1-score: 0.598130589083003

Epoch 9/10 (Train): 100% | ██████████ | 1  
17/117 [00:11<00:00, 10.28sample/s]

Epoch 9/10 (Eval): 100% | ██████████ |  
71/71 [00:03<00:00, 22.37sample/s]

Epoch 9/10, Training Loss: 0.7086887422839283, Validation Loss: 0.6810945633609417  
Accuracy: 0.7096045197740113, Precision: 0.7112377077111617, Recall: 0.7096045197740113, F1-score: 0.7088880272944776

Epoch 10/10 (Train): 100% | ██████████ | 1  
17/117 [00:11<00:00, 10.38sample/s]

Epoch 10/10 (Eval): 100% | ██████████ |  
71/71 [00:03<00:00, 22.25sample/s]

Epoch 10/10, Training Loss: 0.7365699774030956, Validation Loss: 1.3879288536007122  
Accuracy: 0.5084745762711864, Precision: 0.5084523693340899, Recall: 0.5084745762711864, F1-score: 0.5084576302351564

Тренировка завершена!

Test: 100% | ██████████ |  
72/72 [00:03<00:00, 19.85sample/s]

```
Test Accuracy: 0.49498327759197325
Precision: 0.49496560083882596, Recall: 0.49498327759197325, F1-score: 0.49497197866
76309
Accuracy of cats : 48 %
Accuracy of dogs : 50 %
```

```
Class_name: cats
```

```
Train_count: 900
```

```
Test_count: 300
```

```
Valid_count: 300
```

```
Shutil images: 100%|██████████| 150
0/1500 [00:00<00:00, 1832.02image/s]
```

```
Class_name: dogs
```

```
Train_count: 900
```

```
Test_count: 300
```

```
Valid_count: 300
```

```
Shutil images: 100%|██████████| 150
0/1500 [00:00<00:00, 1835.81image/s]
```

---

```
-----
```

Выбранная модель: regnet\_x\_16gf

Пользовательское название модели: regnet\_x\_16gf\_Exp4

Выбранный оптимизатор: SGD

```
-----
```

```
Epoch 1/10 (Train): 100%|██████████| 1
17/117 [00:15<00:00, 7.67sample/s]
Epoch 1/10 (Eval): 100%|██████████| 1
71/71 [00:04<00:00, 16.81sample/s]
```

```
Epoch 1/10, Training Loss: 0.8434193231129663, Validation Loss: 0.8601255283012228
Accuracy: 0.5248587570621469, Precision: 0.5368213706581607, Recall: 0.5248587570621
469, F1-score: 0.4900308939289119
```

```
Epoch 2/10 (Train): 100%|██████████| 1
17/117 [00:14<00:00, 7.81sample/s]
Epoch 2/10 (Eval): 100%|██████████| 1
71/71 [00:04<00:00, 16.57sample/s]
```

```
Epoch 2/10, Training Loss: 0.8450245103295165, Validation Loss: 0.8655756629456235
Accuracy: 0.5282485875706214, Precision: 0.5610610293661141, Recall: 0.5282485875706
214, F1-score: 0.4477264588102654
```

```
Epoch 3/10 (Train): 100%|██████████| 1
17/117 [00:14<00:00, 7.82sample/s]
Epoch 3/10 (Eval): 100%|██████████| 1
71/71 [00:04<00:00, 16.72sample/s]
```

```
Epoch 3/10, Training Loss: 0.8255017541752359, Validation Loss: 0.9054771819188769
Accuracy: 0.5186440677966102, Precision: 0.5416809479395913, Recall: 0.5186440677966
102, F1-score: 0.4303294055871004
```

```
Epoch 4/10 (Train): 100%|██████████| 1
17/117 [00:14<00:00, 7.80sample/s]
Epoch 4/10 (Eval): 100%|██████████| 1
71/71 [00:04<00:00, 16.75sample/s]
```

Epoch 00004: reducing learning rate of group 0 to 1.0000e-04.

Epoch 4/10, Training Loss: 0.8274139176295832, Validation Loss: 0.923819213853044  
Accuracy: 0.5050847457627119, Precision: 0.5278552703710256, Recall: 0.5050847457627119, F1-score: 0.3533499103669136

Epoch 5/10 (Train): 100% | 1  
17/117 [00:15<00:00, 7.72sample/s]  
Epoch 5/10 (Eval): 100% |  
71/71 [00:04<00:00, 16.78sample/s]

Epoch 5/10, Training Loss: 0.7889413185892569, Validation Loss: 0.77705662701763  
Accuracy: 0.5553672316384181, Precision: 0.5596035266440869, Recall: 0.5553672316384181, F1-score: 0.5490904086392434

Epoch 6/10 (Train): 100% | 1  
17/117 [00:15<00:00, 7.79sample/s]  
Epoch 6/10 (Eval): 100% |  
71/71 [00:04<00:00, 16.64sample/s]

Epoch 6/10, Training Loss: 0.7854753334772269, Validation Loss: 0.773031828935537  
Accuracy: 0.5570621468926553, Precision: 0.5668391275928214, Recall: 0.5570621468926553, F1-score: 0.5426923518006092

Epoch 7/10 (Train): 100% | 1  
17/117 [00:15<00:00, 7.74sample/s]  
Epoch 7/10 (Eval): 100% |  
71/71 [00:04<00:00, 16.59sample/s]

Epoch 7/10, Training Loss: 0.784509492806983, Validation Loss: 0.7751436487766309  
Accuracy: 0.53954802259887, Precision: 0.5420792325182052, Recall: 0.53954802259887, F1-score: 0.5346908481187056

Epoch 8/10 (Train): 100% | 1  
17/117 [00:15<00:00, 7.76sample/s]  
Epoch 8/10 (Eval): 100% |  
71/71 [00:04<00:00, 16.57sample/s]

Epoch 8/10, Training Loss: 0.7894177086513446, Validation Loss: 0.7638049975963636  
Accuracy: 0.5598870056497175, Precision: 0.5639994205199749, Recall: 0.5598870056497175, F1-score: 0.5542619947484663

Epoch 9/10 (Train): 100% | 1  
17/117 [00:15<00:00, 7.78sample/s]  
Epoch 9/10 (Eval): 100% |  
71/71 [00:04<00:00, 16.79sample/s]

Epoch 9/10, Training Loss: 0.7888665127786894, Validation Loss: 0.7664363550937782  
Accuracy: 0.5440677966101695, Precision: 0.5450991238108335, Recall: 0.5440677966101695, F1-score: 0.5425842062464521

Epoch 10/10 (Train): 100% | 1  
17/117 [00:15<00:00, 7.73sample/s]  
Epoch 10/10 (Eval): 100% |  
71/71 [00:04<00:00, 16.69sample/s]

Epoch 10/10, Training Loss: 0.7767929691129387, Validation Loss: 0.7678897244445348  
Accuracy: 0.559322033898305, Precision: 0.5645209386039811, Recall: 0.559322033898305, F1-score: 0.5520300243700734

Тренировка завершена!

Test: 100% |  
72/72 [00:04<00:00, 16.12sample/s]

```
Test Accuracy: 0.5652173913043478
Precision: 0.5686657980830044, Recall: 0.5652173913043478, F1-score: 0.5578863807777
912
Accuracy of cats : 43 %
Accuracy of dogs : 69 %
```

```
Class_name: cats
```

```
Train_count: 900
```

```
Test_count: 300
```

```
Valid_count: 300
```

```
Shutil images: 100%|██████████| 150
0/1500 [00:00<00:00, 1620.27image/s]
```

```
Class_name: dogs
```

```
Train_count: 900
```

```
Test_count: 300
```

```
Valid_count: 300
```

```
Shutil images: 100%|██████████| 150
0/1500 [00:00<00:00, 1811.41image/s]
```

---

```
Выбранная модель: regnet_x_1_6gf
```

```
Пользовательское название модели: regnet_x_1_6gf_Exp4
```

```
Выбранный оптимизатор: SGD
```

---

```
Epoch 1/10 (Train): 100%|██████████| 1
17/117 [00:11<00:00, 10.07sample/s]
Epoch 1/10 (Eval): 100%|██████████| 1
71/71 [00:03<00:00, 19.89sample/s]
```

```
Epoch 1/10, Training Loss: 0.881872154389284, Validation Loss: 0.9826265046488767
Accuracy: 0.4994350282485876, Precision: 0.4739975606678723, Recall: 0.4994350282485
876, F1-score: 0.3620978167193335
```

```
Epoch 2/10 (Train): 100%|██████████| 1
17/117 [00:11<00:00, 10.18sample/s]
Epoch 2/10 (Eval): 100%|██████████| 1
71/71 [00:03<00:00, 20.67sample/s]
```

```
Epoch 2/10, Training Loss: 0.8502252476316678, Validation Loss: 0.9736544491544281
Accuracy: 0.47853107344632767, Precision: 0.47809877162968223, Recall: 0.47853107344
632767, F1-score: 0.4711695643888459
```

```
Epoch 3/10 (Train): 100%|██████████| 1
17/117 [00:11<00:00, 10.14sample/s]
Epoch 3/10 (Eval): 100%|██████████| 1
71/71 [00:03<00:00, 20.08sample/s]
```

```
Epoch 3/10, Training Loss: 0.8555047968383355, Validation Loss: 0.8338446372983146
Accuracy: 0.5067796610169492, Precision: 0.5067923757776568, Recall: 0.5067796610169
492, F1-score: 0.47344556474488514
```

```
Epoch 4/10 (Train): 100%|██████████| 1
17/117 [00:11<00:00, 10.13sample/s]
Epoch 4/10 (Eval): 100%|██████████| 1
71/71 [00:03<00:00, 20.11sample/s]
```

Epoch 4/10, Training Loss: 0.8420694444463872, Validation Loss: 0.9961910612333966  
Accuracy: 0.5062146892655367, Precision: 0.5386148676875149, Recall: 0.5062146892655  
367, F1-score: 0.39063977741389677

Epoch 5/10 (Train): 100% | ██████████ | 1  
17/117 [00:11<00:00, 10.27sample/s]  
Epoch 5/10 (Eval): 100% | ██████████ |  
71/71 [00:03<00:00, 20.23sample/s]

Epoch 5/10, Training Loss: 0.8230867851385113, Validation Loss: 0.8032778646312865  
Accuracy: 0.5067796610169492, Precision: 0.5065346136044585, Recall: 0.5067796610169  
492, F1-score: 0.48278520629976934

Epoch 6/10 (Train): 100% | ██████████ | 1  
17/117 [00:11<00:00, 10.19sample/s]  
Epoch 6/10 (Eval): 100% | ██████████ |  
71/71 [00:03<00:00, 20.10sample/s]

Epoch 6/10, Training Loss: 0.8337155184858543, Validation Loss: 0.844898744491534  
Accuracy: 0.5305084745762711, Precision: 0.5395641646489104, Recall: 0.5305084745762  
711, F1-score: 0.49564181492085696

Epoch 7/10 (Train): 100% | ██████████ | 1  
17/117 [00:11<00:00, 10.23sample/s]  
Epoch 7/10 (Eval): 100% | ██████████ |  
71/71 [00:03<00:00, 20.16sample/s]

Epoch 7/10, Training Loss: 0.8303162455150246, Validation Loss: 0.9955005293848824  
Accuracy: 0.5062146892655367, Precision: 0.5075234692707514, Recall: 0.5062146892655  
367, F1-score: 0.4987618690161063

Epoch 8/10 (Train): 100% | ██████████ | 1  
17/117 [00:11<00:00, 10.27sample/s]  
Epoch 8/10 (Eval): 100% | ██████████ |  
71/71 [00:03<00:00, 19.09sample/s]

Epoch 00008: reducing learning rate of group 0 to 1.0000e-04.

Epoch 8/10, Training Loss: 0.8301323733565087, Validation Loss: 0.8793731128933739  
Accuracy: 0.5062146892655367, Precision: 0.5168127800506527, Recall: 0.5062146892655  
367, F1-score: 0.37976035264170854

Epoch 9/10 (Train): 100% | ██████████ | 1  
17/117 [00:11<00:00, 10.26sample/s]  
Epoch 9/10 (Eval): 100% | ██████████ |  
71/71 [00:03<00:00, 20.20sample/s]

Epoch 9/10, Training Loss: 0.800136425035142, Validation Loss: 0.7795966663266306  
Accuracy: 0.53954802259887, Precision: 0.5399038660663303, Recall: 0.53954802259887,  
F1-score: 0.5370159389732954

Epoch 10/10 (Train): 100% | ██████████ | 1  
17/117 [00:11<00:00, 10.09sample/s]  
Epoch 10/10 (Eval): 100% | ██████████ |  
71/71 [00:03<00:00, 19.77sample/s]

Epoch 10/10, Training Loss: 0.7988136151296134, Validation Loss: 0.8037195660300174  
Accuracy: 0.5372881355932203, Precision: 0.5372535694802385, Recall: 0.5372881355932  
203, F1-score: 0.5365890242073262

Тренировка завершена!

Test: 100% | ██████████ |  
72/72 [00:04<00:00, 17.72sample/s]

```
Test Accuracy: 0.5362318840579711
Precision: 0.5370683684488614, Recall: 0.5362318840579711, F1-score: 0.5350430683057
291
Accuracy of cats : 58 %
Accuracy of dogs : 48 %
```

```
Class_name: cats
```

```
Train_count: 900
```

```
Test_count: 300
```

```
Valid_count: 300
```

```
Shutil images: 100%|██████████| 150
0/1500 [00:00<00:00, 1816.88image/s]
```

```
Class_name: dogs
```

```
Train_count: 900
```

```
Test_count: 300
```

```
Valid_count: 300
```

```
Shutil images: 100%|██████████| 150
0/1500 [00:00<00:00, 1811.12image/s]
```

---

```
Выбранная модель: regnet_x_3_2gf
```

```
Пользовательское название модели: regnet_x_3_2gf_Exp4
```

```
Выбранный оптимизатор: SGD
```

---

```
Epoch 1/10 (Train): 100%|██████████| 1
17/117 [00:14<00:00, 8.35sample/s]
```

```
Epoch 1/10 (Eval): 100%|██████████| 1
71/71 [00:04<00:00, 17.37sample/s]
```

```
Epoch 1/10, Training Loss: 0.8791294423907975, Validation Loss: 1.0415068957428475
Accuracy: 0.5175141242937853, Precision: 0.5197672091439143, Recall: 0.5175141242937853,
F1-score: 0.493390122017632
```

```
Epoch 2/10 (Train): 100%|██████████| 1
17/117 [00:13<00:00, 8.36sample/s]
```

```
Epoch 2/10 (Eval): 100%|██████████| 1
71/71 [00:03<00:00, 17.95sample/s]
```

```
Epoch 2/10, Training Loss: 0.8766394730215615, Validation Loss: 0.8308049731672147
Accuracy: 0.4943502824858757, Precision: 0.4941330658935529, Recall: 0.4943502824858757,
F1-score: 0.4938310468292336
```

```
Epoch 3/10 (Train): 100%|██████████| 1
17/117 [00:14<00:00, 8.28sample/s]
```

```
Epoch 3/10 (Eval): 100%|██████████| 1
71/71 [00:03<00:00, 17.80sample/s]
```

```
Epoch 3/10, Training Loss: 0.8463022693572917, Validation Loss: 0.829815050134551
Accuracy: 0.5265536723163842, Precision: 0.5287005520724988, Recall: 0.5265536723163842,
F1-score: 0.5123460872837315
```

```
Epoch 4/10 (Train): 100%|██████████| 1
17/117 [00:14<00:00, 8.27sample/s]
```

```
Epoch 4/10 (Eval): 100%|██████████| 1
71/71 [00:04<00:00, 17.54sample/s]
```

Epoch 4/10, Training Loss: 0.8424269700597785, Validation Loss: 0.7951849343749763  
Accuracy: 0.5384180790960452, Precision: 0.5383580879755127, Recall: 0.5384180790960  
452, F1-score: 0.5380397756918897

Epoch 5/10 (Train): 100% | ██████████ | 1  
17/117 [00:14<00:00, 8.26sample/s]  
Epoch 5/10 (Eval): 100% | ██████████ |  
71/71 [00:04<00:00, 17.50sample/s]

Epoch 5/10, Training Loss: 0.8560467725792023, Validation Loss: 0.8241822486375011  
Accuracy: 0.5214689265536723, Precision: 0.5451621835171477, Recall: 0.5214689265536  
723, F1-score: 0.457862788815923

Epoch 6/10 (Train): 100% | ██████████ | 1  
17/117 [00:13<00:00, 8.37sample/s]  
Epoch 6/10 (Eval): 100% | ██████████ |  
71/71 [00:04<00:00, 17.61sample/s]

Epoch 6/10, Training Loss: 0.8355155157217675, Validation Loss: 0.8289444500443626  
Accuracy: 0.5141242937853108, Precision: 0.5418969654696585, Recall: 0.5141242937853  
108, F1-score: 0.40461983759423575

Epoch 7/10 (Train): 100% | ██████████ | 1  
17/117 [00:13<00:00, 8.44sample/s]  
Epoch 7/10 (Eval): 100% | ██████████ |  
71/71 [00:04<00:00, 17.52sample/s]

Epoch 7/10, Training Loss: 0.8432666647916301, Validation Loss: 0.7803758384480988  
Accuracy: 0.523728813559322, Precision: 0.526742941785104, Recall: 0.52372881355932  
2, F1-score: 0.514593731056034

Epoch 8/10 (Train): 100% | ██████████ | 1  
17/117 [00:13<00:00, 8.43sample/s]  
Epoch 8/10 (Eval): 100% | ██████████ |  
71/71 [00:04<00:00, 17.66sample/s]

Epoch 8/10, Training Loss: 0.8373418165201026, Validation Loss: 0.784470148005728  
Accuracy: 0.5536723163841808, Precision: 0.5562112198300331, Recall: 0.5536723163841  
808, F1-score: 0.5500025686613201

Epoch 9/10 (Train): 100% | ██████████ | 1  
17/117 [00:14<00:00, 8.36sample/s]  
Epoch 9/10 (Eval): 100% | ██████████ |  
71/71 [00:04<00:00, 17.20sample/s]

Epoch 9/10, Training Loss: 0.8268777279922453, Validation Loss: 0.901202614024534  
Accuracy: 0.5101694915254237, Precision: 0.5655842142561862, Recall: 0.5101694915254  
237, F1-score: 0.36850686630895346

Epoch 10/10 (Train): 100% | ██████████ | 1  
17/117 [00:14<00:00, 8.33sample/s]  
Epoch 10/10 (Eval): 100% | ██████████ |  
71/71 [00:04<00:00, 17.52sample/s]

Epoch 00010: reducing learning rate of group 0 to 1.0000e-04.

Epoch 10/10, Training Loss: 0.8307282381306126, Validation Loss: 0.8087468862870318  
Accuracy: 0.5350282485875706, Precision: 0.5363523265087803, Recall: 0.5350282485875  
706, F1-score: 0.5325518460768656

Тренировка завершена!

Test: 100% | ██████████ |  
72/72 [00:04<00:00, 16.00sample/s]

```
Test Accuracy: 0.5412486064659978
Precision: 0.5416141934100346, Recall: 0.5412486064659978, F1-score: 0.5385232819080
419
Accuracy of cats : 46 %
Accuracy of dogs : 61 %
```

```
Class_name: cats
```

```
Train_count: 900
```

```
Test_count: 300
```

```
Valid_count: 300
```

```
Shutil images: 100%|██████████| 150
0/1500 [00:00<00:00, 1819.22image/s]
```

```
Class_name: dogs
```

```
Train_count: 900
```

```
Test_count: 300
```

```
Valid_count: 300
```

```
Shutil images: 100%|██████████| 150
0/1500 [00:00<00:00, 1754.98image/s]
```

---

```
-----
```

Выбранная модель: regnet\_x\_400mf

Пользовательское название модели: regnet\_x\_400mf\_Exp4

Выбранный оптимизатор: SGD

```
-----
```

```
Epoch 1/10 (Train): 100%|██████████| 1
17/117 [00:11<00:00, 9.93sample/s]
Epoch 1/10 (Eval): 100%|██████████| 1
71/71 [00:03<00:00, 19.29sample/s]
```

```
Epoch 1/10, Training Loss: 1.536970369757815, Validation Loss: 2.2874388620257378
Accuracy: 0.5028248587570622, Precision: 0.253260005173851, Recall: 0.50282485875706
22, F1-score: 0.33685484898687396
```

```
Epoch 2/10 (Train): 100%|██████████| 1
17/117 [00:11<00:00, 9.93sample/s]
Epoch 2/10 (Eval): 100%|██████████| 1
71/71 [00:03<00:00, 19.19sample/s]
```

```
Epoch 2/10, Training Loss: 1.5599198642865364, Validation Loss: 1.8765810974847295
Accuracy: 0.503954802259887, Precision: 0.5515148605175973, Recall: 0.50395480225988
7, F1-score: 0.3403537591581141
```

```
Epoch 3/10 (Train): 100%|██████████| 1
17/117 [00:11<00:00, 9.83sample/s]
Epoch 3/10 (Eval): 100%|██████████| 1
71/71 [00:03<00:00, 19.13sample/s]
```

```
Epoch 3/10, Training Loss: 1.6035347429140534, Validation Loss: 4.344405454927862
Accuracy: 0.4966101694915254, Precision: 0.2466216604424016, Recall: 0.4966101694915
254, F1-score: 0.329573679866403
```

```
Epoch 4/10 (Train): 100%|██████████| 1
17/117 [00:11<00:00, 9.98sample/s]
Epoch 4/10 (Eval): 100%|██████████| 1
71/71 [00:03<00:00, 19.32sample/s]
```

Epoch 4/10, Training Loss: 1.5900489848472223, Validation Loss: 0.9922575192094523  
Accuracy: 0.5310734463276836, Precision: 0.5673317470196851, Recall: 0.5310734463276  
836, F1-score: 0.46422091556873857

Epoch 5/10 (Train): 100% | ██████████ | 1  
17/117 [00:11<00:00, 10.03sample/s]  
Epoch 5/10 (Eval): 100% | ██████████ |  
71/71 [00:03<00:00, 19.09sample/s]

Epoch 5/10, Training Loss: 1.5445006907272207, Validation Loss: 1.677424509625482  
Accuracy: 0.503954802259887, Precision: 0.7501547364689425, Recall: 0.50395480225988  
7, F1-score: 0.3383619970573583

Epoch 6/10 (Train): 100% | ██████████ | 1  
17/117 [00:11<00:00, 9.91sample/s]  
Epoch 6/10 (Eval): 100% | ██████████ |  
71/71 [00:03<00:00, 19.04sample/s]

Epoch 6/10, Training Loss: 1.3668588998997513, Validation Loss: 0.9780698045667282  
Accuracy: 0.5378531073446328, Precision: 0.612166712066519, Recall: 0.53785310734463  
28, F1-score: 0.45070111093938287

Epoch 7/10 (Train): 100% | ██████████ | 1  
17/117 [00:11<00:00, 10.03sample/s]  
Epoch 7/10 (Eval): 100% | ██████████ |  
71/71 [00:03<00:00, 19.38sample/s]

Epoch 7/10, Training Loss: 1.3269486107427506, Validation Loss: 2.2220517397558286  
Accuracy: 0.5033898305084745, Precision: 0.25340132145935074, Recall: 0.503389830508  
4745, F1-score: 0.3371066057745591

Epoch 8/10 (Train): 100% | ██████████ | 1  
17/117 [00:11<00:00, 10.02sample/s]  
Epoch 8/10 (Eval): 100% | ██████████ |  
71/71 [00:03<00:00, 19.22sample/s]

Epoch 8/10, Training Loss: 1.4371600539779075, Validation Loss: 0.8715475969395395  
Accuracy: 0.5457627118644067, Precision: 0.5546720454807078, Recall: 0.5457627118644  
067, F1-score: 0.5228029871396856

Epoch 9/10 (Train): 100% | ██████████ | 1  
17/117 [00:11<00:00, 10.00sample/s]  
Epoch 9/10 (Eval): 100% | ██████████ |  
71/71 [00:03<00:00, 18.92sample/s]

Epoch 9/10, Training Loss: 1.30375360727637, Validation Loss: 0.98791789116159  
Accuracy: 0.535593220338983, Precision: 0.5836081206928664, Recall: 0.53559322033898  
3, F1-score: 0.4521162768677209

Epoch 10/10 (Train): 100% | ██████████ | 1  
17/117 [00:11<00:00, 10.18sample/s]  
Epoch 10/10 (Eval): 100% | ██████████ |  
71/71 [00:03<00:00, 19.36sample/s]

Epoch 10/10, Training Loss: 1.2154927277111534, Validation Loss: 2.0997117528965497  
Accuracy: 0.4966101694915254, Precision: 0.2466216604424016, Recall: 0.4966101694915  
254, F1-score: 0.329573679866403

Тренировка завершена!

Test: 100% | ██████████ |  
72/72 [00:04<00:00, 17.68sample/s]

```
Test Accuracy: 0.5039018952062431
Precision: 0.25391711999244354, Recall: 0.5039018952062431, F1-score: 0.337677771138
95014
Accuracy of cats : 0 %
Accuracy of dogs : 100 %
```

```
Class_name: cats
```

```
Train_count: 900
```

```
Test_count: 300
```

```
Valid_count: 300
```

```
Shutil images: 100%|██████████| 150
0/1500 [00:00<00:00, 1889.37image/s]
```

```
Class_name: dogs
```

```
Train_count: 900
```

```
Test_count: 300
```

```
Valid_count: 300
```

```
Shutil images: 100%|██████████| 150
0/1500 [00:00<00:00, 1822.16image/s]
```

---

```
-----
```

Выбранная модель: regnet\_x\_800mf

Пользовательское название модели: regnet\_x\_800mf\_Exp4

Выбранный оптимизатор: SGD

```
-----
```

```
Epoch 1/10 (Train): 100%|██████████| 1
17/117 [00:10<00:00, 10.85sample/s]
Epoch 1/10 (Eval): 100%|██████████| 1
71/71 [00:03<00:00, 21.25sample/s]
```

```
Epoch 1/10, Training Loss: 1.0830413646858141, Validation Loss: 1.7469501497834332
Accuracy: 0.5033898305084745, Precision: 0.25340132145935074, Recall: 0.503389830508
4745, F1-score: 0.3371066057745591
```

```
Epoch 2/10 (Train): 100%|██████████| 1
17/117 [00:10<00:00, 10.69sample/s]
Epoch 2/10 (Eval): 100%|██████████| 1
71/71 [00:03<00:00, 21.00sample/s]
```

```
Epoch 2/10, Training Loss: 1.041890750934687, Validation Loss: 1.4284073545644849
Accuracy: 0.4966101694915254, Precision: 0.2466216604424016, Recall: 0.4966101694915
254, F1-score: 0.329573679866403
```

```
Epoch 3/10 (Train): 100%|██████████| 1
17/117 [00:10<00:00, 10.83sample/s]
Epoch 3/10 (Eval): 100%|██████████| 1
71/71 [00:03<00:00, 20.95sample/s]
```

```
Epoch 3/10, Training Loss: 1.0330829381779336, Validation Loss: 0.8559879181580355
Accuracy: 0.5090395480225989, Precision: 0.5155239119340874, Recall: 0.5090395480225
989, F1-score: 0.46997498531226967
```

```
Epoch 4/10 (Train): 100%|██████████| 1
17/117 [00:10<00:00, 10.76sample/s]
Epoch 4/10 (Eval): 100%|██████████| 1
71/71 [00:03<00:00, 20.74sample/s]
```

Epoch 4/10, Training Loss: 1.008681089727743, Validation Loss: 1.0707014348294774  
Accuracy: 0.5062146892655367, Precision: 0.6050793661420062, Recall: 0.5062146892655367, F1-score: 0.361511663894543

Epoch 5/10 (Train): 100% | 17/117 [00:10<00:00, 10.75sample/s]

Epoch 5/10 (Eval): 100% | 71/71 [00:03<00:00, 20.59sample/s]

Epoch 5/10, Training Loss: 0.9673735500403347, Validation Loss: 1.2181881140854398  
Accuracy: 0.5028248587570622, Precision: 0.4739827460642867, Recall: 0.5028248587570622, F1-score: 0.3408264465093977

Epoch 6/10 (Train): 100% | 17/117 [00:10<00:00, 10.93sample/s]

Epoch 6/10 (Eval): 100% | 71/71 [00:03<00:00, 20.88sample/s]

Epoch 00006: reducing learning rate of group 0 to 1.0000e-04.

Epoch 6/10, Training Loss: 1.094164513148536, Validation Loss: 1.0908327215051248  
Accuracy: 0.5056497175141242, Precision: 0.6678196702409778, Recall: 0.5056497175141242, F1-score: 0.34310064157809056

Epoch 7/10 (Train): 100% | 17/117 [00:10<00:00, 10.69sample/s]

Epoch 7/10 (Eval): 100% | 71/71 [00:03<00:00, 19.65sample/s]

Epoch 7/10, Training Loss: 0.8073012983047284, Validation Loss: 0.7977624909352448  
Accuracy: 0.5423728813559322, Precision: 0.544379530120608, Recall: 0.5423728813559322, F1-score: 0.5388895563469989

Epoch 8/10 (Train): 100% | 17/117 [00:10<00:00, 10.97sample/s]

Epoch 8/10 (Eval): 100% | 71/71 [00:03<00:00, 19.91sample/s]

Epoch 8/10, Training Loss: 0.8013232447988289, Validation Loss: 0.7869283428973397  
Accuracy: 0.5683615819209039, Precision: 0.5689042782189281, Recall: 0.5683615819209039, F1-score: 0.5679341352380375

Epoch 9/10 (Train): 100% | 17/117 [00:11<00:00, 10.51sample/s]

Epoch 9/10 (Eval): 100% | 71/71 [00:03<00:00, 20.26sample/s]

Epoch 9/10, Training Loss: 0.7991563969887308, Validation Loss: 0.7854050246335692  
Accuracy: 0.5480225988700564, Precision: 0.5494195379961809, Recall: 0.5480225988700564, F1-score: 0.5460109495111716

Epoch 10/10 (Train): 100% | 17/117 [00:11<00:00, 10.60sample/s]

Epoch 10/10 (Eval): 100% | 71/71 [00:03<00:00, 20.62sample/s]

Epoch 10/10, Training Loss: 0.7980990095486618, Validation Loss: 0.7859697075886914  
Accuracy: 0.5485875706214689, Precision: 0.5499757106549613, Recall: 0.5485875706214689, F1-score: 0.5466125737063756

Тренировка завершена!

Test: 100% | 72/72 [00:03<00:00, 18.80sample/s]

```
Test Accuracy: 0.5440356744704571
Precision: 0.5445207869438062, Recall: 0.5440356744704571, F1-score: 0.5411252055997
404
Accuracy of cats : 46 %
Accuracy of dogs : 62 %
```

```
Class_name: cats
```

```
Train_count: 900
```

```
Test_count: 300
```

```
Valid_count: 300
```

```
Shutil images: 100%|██████████| 150
0/1500 [00:00<00:00, 1847.72image/s]
```

```
Class_name: dogs
```

```
Train_count: 900
```

```
Test_count: 300
```

```
Valid_count: 300
```

```
Shutil images: 100%|██████████| 150
0/1500 [00:00<00:00, 1853.81image/s]
```

---

```
-----
```

Выбранная модель: regnet\_y\_16gf

Пользовательское название модели: regnet\_y\_16gf\_Exp4

Выбранный оптимизатор: SGD

```
-----
```

```
Epoch 1/10 (Train): 100%|██████████| 1
17/117 [00:16<00:00, 6.88sample/s]
Epoch 1/10 (Eval): 100%|██████████| 1
71/71 [00:04<00:00, 14.79sample/s]
```

```
Epoch 1/10, Training Loss: 0.9230622273140202, Validation Loss: 0.8735778170116877
Accuracy: 0.5180790960451978, Precision: 0.5180680767007304, Recall: 0.5180790960451
978, F1-score: 0.5139600847694856
```

```
Epoch 2/10 (Train): 100%|██████████| 1
17/117 [00:17<00:00, 6.76sample/s]
Epoch 2/10 (Eval): 100%|██████████| 1
71/71 [00:04<00:00, 14.94sample/s]
```

```
Epoch 2/10, Training Loss: 0.8918250176782392, Validation Loss: 1.1126021386708242
Accuracy: 0.5225988700564972, Precision: 0.5461865108118376, Recall: 0.5225988700564
972, F1-score: 0.44335423462620444
```

```
Epoch 3/10 (Train): 100%|██████████| 1
17/117 [00:17<00:00, 6.58sample/s]
Epoch 3/10 (Eval): 100%|██████████| 1
71/71 [00:04<00:00, 14.59sample/s]
```

```
Epoch 3/10, Training Loss: 0.9102937172054019, Validation Loss: 0.9464134206879611
Accuracy: 0.5338983050847458, Precision: 0.5507461821374643, Recall: 0.5338983050847
458, F1-score: 0.4971434840989619
```

```
Epoch 4/10 (Train): 100%|██████████| 1
17/117 [00:17<00:00, 6.81sample/s]
Epoch 4/10 (Eval): 100%|██████████| 1
71/71 [00:04<00:00, 14.70sample/s]
```

Epoch 00004: reducing learning rate of group 0 to 1.0000e-04.

Epoch 4/10, Training Loss: 0.8866803605234566, Validation Loss: 0.8766953564633084  
Accuracy: 0.5327683615819209, Precision: 0.5966389990490234, Recall: 0.5327683615819  
209, F1-score: 0.4455430790162753

Epoch 5/10 (Train): 100% | ██████████ | 1  
17/117 [00:17<00:00, 6.50sample/s]  
Epoch 5/10 (Eval): 100% | ██████████ |  
71/71 [00:04<00:00, 14.81sample/s]

Epoch 5/10, Training Loss: 0.792063921301883, Validation Loss: 0.8697946905079534  
Accuracy: 0.5468926553672316, Precision: 0.562640992832651, Recall: 0.54689265536723  
16, F1-score: 0.5201804553280812

Epoch 6/10 (Train): 100% | ██████████ | 1  
17/117 [00:17<00:00, 6.59sample/s]  
Epoch 6/10 (Eval): 100% | ██████████ |  
71/71 [00:05<00:00, 13.98sample/s]

Epoch 6/10, Training Loss: 0.786491107703726, Validation Loss: 0.8802576154302069  
Accuracy: 0.5570621468926553, Precision: 0.5572789712541983, Recall: 0.5570621468926  
553, F1-score: 0.5569399697790859

Epoch 7/10 (Train): 100% | ██████████ | 1  
17/117 [00:17<00:00, 6.62sample/s]  
Epoch 7/10 (Eval): 100% | ██████████ |  
71/71 [00:05<00:00, 13.70sample/s]

Epoch 7/10, Training Loss: 0.7853883006255703, Validation Loss: 0.785031958656796  
Accuracy: 0.5536723163841808, Precision: 0.5632045793506548, Recall: 0.5536723163841  
808, F1-score: 0.5388090185628407

Epoch 8/10 (Train): 100% | ██████████ | 1  
17/117 [00:18<00:00, 6.38sample/s]  
Epoch 8/10 (Eval): 100% | ██████████ |  
71/71 [00:04<00:00, 14.45sample/s]

Epoch 8/10, Training Loss: 0.7715911168689349, Validation Loss: 0.8238873921208463  
Accuracy: 0.5694915254237288, Precision: 0.5704016671799561, Recall: 0.5694915254237  
288, F1-score: 0.5686590600546745

Epoch 9/10 (Train): 100% | ██████████ | 1  
17/117 [00:17<00:00, 6.78sample/s]  
Epoch 9/10 (Eval): 100% | ██████████ |  
71/71 [00:04<00:00, 15.07sample/s]

Epoch 9/10, Training Loss: 0.7802507827100564, Validation Loss: 0.9338577224709893  
Accuracy: 0.5480225988700564, Precision: 0.558695141636274, Recall: 0.54802259887005  
64, F1-score: 0.5296614161411519

Epoch 10/10 (Train): 100% | ██████████ | 1  
17/117 [00:17<00:00, 6.77sample/s]  
Epoch 10/10 (Eval): 100% | ██████████ |  
71/71 [00:04<00:00, 14.96sample/s]

Epoch 10/10, Training Loss: 0.7803396457797293, Validation Loss: 0.780040466179282  
Accuracy: 0.5627118644067797, Precision: 0.5640091878269884, Recall: 0.5627118644067  
797, F1-score: 0.5593793947222152

Тренировка завершена!

Test: 100% | ██████████ |  
72/72 [00:05<00:00, 14.35sample/s]

```
Test Accuracy: 0.5507246376811594
Precision: 0.5534063717960774, Recall: 0.5507246376811594, F1-score: 0.5468071718022
49
Accuracy of cats : 64 %
Accuracy of dogs : 45 %
```

```
Class_name: cats
Train_count: 900
Test_count: 300
Valid_count: 300
```

```
Shutil images: 100%|██████████| 150
0/1500 [00:00<00:00, 1809.84image/s]
```

```
Class_name: dogs
Train_count: 900
Test_count: 300
Valid_count: 300
```

```
Shutil images: 100%|██████████| 150
0/1500 [00:00<00:00, 1783.16image/s]
```

---

```
-----  
Выбранная модель: regnet_y_1_6gf
Пользовательское название модели: regnet_y_1_6gf_Exp4
Выбранный оптимизатор: SGD
```

---

```
Epoch 1/10 (Train): 100%|██████████| 1
17/117 [00:18<00:00, 6.19sample/s]
Epoch 1/10 (Eval): 100%|██████████| 1
71/71 [00:04<00:00, 14.87sample/s]
```

```
Epoch 1/10, Training Loss: 0.8694810861385873, Validation Loss: 1.774416958713262
Accuracy: 0.5124293785310734, Precision: 0.5144994062685014, Recall: 0.5124293785310
734, F1-score: 0.5030775680917644
```

```
Epoch 2/10 (Train): 100%|██████████| 1
17/117 [00:18<00:00, 6.19sample/s]
Epoch 2/10 (Eval): 100%|██████████| 1
71/71 [00:04<00:00, 15.06sample/s]
```

```
Epoch 2/10, Training Loss: 0.8409693627589528, Validation Loss: 1.0286962172742617
Accuracy: 0.5203389830508475, Precision: 0.5215297649619685, Recall: 0.5203389830508
475, F1-score: 0.5070039987192154
```

```
Epoch 3/10 (Train): 100%|██████████| 1
17/117 [00:18<00:00, 6.24sample/s]
Epoch 3/10 (Eval): 100%|██████████| 1
71/71 [00:04<00:00, 15.09sample/s]
```

```
Epoch 3/10, Training Loss: 0.8402348847688266, Validation Loss: 1.2371557663052768
Accuracy: 0.5005649717514125, Precision: 0.501389610185229, Recall: 0.50056497175141
25, F1-score: 0.49462843575612636
```

```
Epoch 4/10 (Train): 100%|██████████| 1
17/117 [00:18<00:00, 6.26sample/s]
Epoch 4/10 (Eval): 100%|██████████| 1
71/71 [00:04<00:00, 14.95sample/s]
```

Epoch 4/10, Training Loss: 0.8332485578050346, Validation Loss: 1.1236963841201222  
Accuracy: 0.5372881355932203, Precision: 0.5382491589935322, Recall: 0.5372881355932  
203, F1-score: 0.5320666446824808

Epoch 5/10 (Train): 100% | ██████████ | 1  
17/117 [00:18<00:00, 6.25sample/s]  
Epoch 5/10 (Eval): 100% | ██████████ |  
71/71 [00:04<00:00, 14.85sample/s]

Epoch 5/10, Training Loss: 0.8438413029382129, Validation Loss: 0.9627617643041125  
Accuracy: 0.5152542372881356, Precision: 0.5582269312715189, Recall: 0.5152542372881  
356, F1-score: 0.41492743562103007

Epoch 6/10 (Train): 100% | ██████████ | 1  
17/117 [00:18<00:00, 6.21sample/s]  
Epoch 6/10 (Eval): 100% | ██████████ |  
71/71 [00:04<00:00, 15.03sample/s]

Epoch 6/10, Training Loss: 0.8165862771074114, Validation Loss: 0.9855055766085447  
Accuracy: 0.5062146892655367, Precision: 0.5400853179196905, Recall: 0.5062146892655  
367, F1-score: 0.3566684080179553

Epoch 7/10 (Train): 100% | ██████████ | 1  
17/117 [00:18<00:00, 6.18sample/s]  
Epoch 7/10 (Eval): 100% | ██████████ |  
71/71 [00:04<00:00, 15.13sample/s]

Epoch 7/10, Training Loss: 0.8148051360398633, Validation Loss: 0.8215627850449018  
Accuracy: 0.5338983050847458, Precision: 0.5371412628169219, Recall: 0.5338983050847  
458, F1-score: 0.5265285323615602

Epoch 8/10 (Train): 100% | ██████████ | 1  
17/117 [00:19<00:00, 6.10sample/s]  
Epoch 8/10 (Eval): 100% | ██████████ |  
71/71 [00:04<00:00, 14.70sample/s]

Epoch 8/10, Training Loss: 0.8164815061136498, Validation Loss: 1.0290328449448622  
Accuracy: 0.5231638418079096, Precision: 0.548527307204778, Recall: 0.52316384180790  
96, F1-score: 0.45954635400780963

Epoch 9/10 (Train): 100% | ██████████ | 1  
17/117 [00:19<00:00, 6.06sample/s]  
Epoch 9/10 (Eval): 100% | ██████████ |  
71/71 [00:04<00:00, 15.00sample/s]

Epoch 9/10, Training Loss: 0.8188306454357176, Validation Loss: 0.9104268840477292  
Accuracy: 0.5310734463276836, Precision: 0.5326514854242351, Recall: 0.5310734463276  
836, F1-score: 0.5216795838250993

Epoch 10/10 (Train): 100% | ██████████ | 1  
17/117 [00:19<00:00, 6.10sample/s]  
Epoch 10/10 (Eval): 100% | ██████████ |  
71/71 [00:04<00:00, 14.92sample/s]

Epoch 10/10, Training Loss: 0.8180271535192637, Validation Loss: 0.8188673729276926  
Accuracy: 0.5389830508474577, Precision: 0.5391855352021546, Recall: 0.5389830508474  
577, F1-score: 0.5370671362535769

Тренировка завершена!

Test: 100% | ██████████ |  
72/72 [00:05<00:00, 13.93sample/s]

```
Test Accuracy: 0.5178372352285395
Precision: 0.5185303694232951, Recall: 0.5178372352285395, F1-score: 0.5164020817180
732
Accuracy of cats : 57 %
Accuracy of dogs : 46 %
```

```
Class_name: cats
Train_count: 900
Test_count: 300
Valid_count: 300
```

```
Shutil images: 100%|██████████| 150
0/1500 [00:00<00:00, 1838.74image/s]
```

```
Class_name: dogs
Train_count: 900
Test_count: 300
Valid_count: 300
```

```
Shutil images: 100%|██████████| 150
0/1500 [00:00<00:00, 1831.69image/s]
```

---

```
-----  
Выбранная модель: regnet_y_3_2gf
Пользовательское название модели: regnet_y_3_2gf_Exp4
Выбранный оптимизатор: SGD
```

---

```
Epoch 1/10 (Train): 100%|██████████| 1
17/117 [00:17<00:00, 6.63sample/s]
Epoch 1/10 (Eval): 100%|██████████| 1
71/71 [00:04<00:00, 15.90sample/s]
```

```
Epoch 1/10, Training Loss: 0.8334725336149346, Validation Loss: 0.8411160535731558
Accuracy: 0.4971751412429379, Precision: 0.49618340513720127, Recall: 0.497175141242
9379, F1-score: 0.4899960346731815
```

```
Epoch 2/10 (Train): 100%|██████████| 1
17/117 [00:17<00:00, 6.66sample/s]
Epoch 2/10 (Eval): 100%|██████████| 1
71/71 [00:04<00:00, 15.63sample/s]
```

```
Epoch 2/10, Training Loss: 0.8256088885605702, Validation Loss: 0.8638279550829849
Accuracy: 0.5005649717514125, Precision: 0.5045966889641337, Recall: 0.5005649717514
125, F1-score: 0.44470847049949125
```

```
Epoch 3/10 (Train): 100%|██████████| 1
17/117 [00:17<00:00, 6.75sample/s]
Epoch 3/10 (Eval): 100%|██████████| 1
71/71 [00:04<00:00, 15.60sample/s]
```

```
Epoch 3/10, Training Loss: 0.815074047480976, Validation Loss: 0.9045371566451875
Accuracy: 0.5344632768361582, Precision: 0.5345124110246263, Recall: 0.5344632768361
582, F1-score: 0.5344632768361582
```

```
Epoch 4/10 (Train): 100%|██████████| 1
17/117 [00:17<00:00, 6.74sample/s]
Epoch 4/10 (Eval): 100%|██████████| 1
71/71 [00:04<00:00, 15.67sample/s]
```

Epoch 00004: reducing learning rate of group 0 to 1.0000e-04.

Epoch 4/10, Training Loss: 0.8258624274367907, Validation Loss: 0.9551252399460745  
Accuracy: 0.5146892655367231, Precision: 0.5191007229937401, Recall: 0.5146892655367231, F1-score: 0.49485655959829855

Epoch 5/10 (Train): 100% | ██████████ | 1  
17/117 [00:18<00:00, 6.34sample/s]  
Epoch 5/10 (Eval): 100% | ██████████ |  
71/71 [00:05<00:00, 13.81sample/s]

Epoch 5/10, Training Loss: 0.8063524686326059, Validation Loss: 0.8050773409800341  
Accuracy: 0.5180790960451978, Precision: 0.5179372652482803, Recall: 0.5180790960451978, F1-score: 0.5173509617202067

Epoch 6/10 (Train): 100% | ██████████ | 1  
17/117 [00:18<00:00, 6.47sample/s]  
Epoch 6/10 (Eval): 100% | ██████████ |  
71/71 [00:04<00:00, 15.69sample/s]

Epoch 6/10, Training Loss: 0.7972000726409936, Validation Loss: 0.8083597499098482  
Accuracy: 0.5299435028248588, Precision: 0.5299104409075628, Recall: 0.5299435028248588, F1-score: 0.5287300204133151

Epoch 7/10 (Train): 100% | ██████████ | 1  
17/117 [00:17<00:00, 6.75sample/s]  
Epoch 7/10 (Eval): 100% | ██████████ |  
71/71 [00:04<00:00, 15.58sample/s]

Epoch 7/10, Training Loss: 0.8018052812469095, Validation Loss: 0.8418306920488002  
Accuracy: 0.5203389830508475, Precision: 0.5214214011585596, Recall: 0.5203389830508475, F1-score: 0.5174550798001232

Epoch 8/10 (Train): 100% | ██████████ | 1  
17/117 [00:17<00:00, 6.86sample/s]  
Epoch 8/10 (Eval): 100% | ██████████ |  
71/71 [00:04<00:00, 15.85sample/s]

Epoch 00008: reducing learning rate of group 0 to 1.0000e-05.

Epoch 8/10, Training Loss: 0.7962637105528992, Validation Loss: 0.8431840341980175  
Accuracy: 0.5146892655367231, Precision: 0.5153752499269599, Recall: 0.5146892655367231, F1-score: 0.5128481477005837

Epoch 9/10 (Train): 100% | ██████████ | 1  
17/117 [00:16<00:00, 6.88sample/s]  
Epoch 9/10 (Eval): 100% | ██████████ |  
71/71 [00:04<00:00, 16.00sample/s]

Epoch 9/10, Training Loss: 0.7982420637805303, Validation Loss: 0.8098918861251766  
Accuracy: 0.5180790960451978, Precision: 0.5185950456887617, Recall: 0.5180790960451978, F1-score: 0.5170229289253868

Epoch 10/10 (Train): 100% | ██████████ | 1  
17/117 [00:17<00:00, 6.84sample/s]  
Epoch 10/10 (Eval): 100% | ██████████ |  
71/71 [00:04<00:00, 15.86sample/s]

Epoch 10/10, Training Loss: 0.7944993555872631, Validation Loss: 0.8359930261043506  
Accuracy: 0.5322033898305085, Precision: 0.5322346903883808, Recall: 0.5322033898305085, F1-score: 0.5322081680130155

Тренировка завершена!

Test: 100% | ██████████ |  
72/72 [00:04<00:00, 15.40sample/s]

```
Test Accuracy: 0.544593088071349
Precision: 0.5446649935217197, Recall: 0.5445930880713489, F1-score: 0.54459096555789
95
Accuracy of cats : 54 %
Accuracy of dogs : 53 %
```

```
Class_name: cats
```

```
Train_count: 900
```

```
Test_count: 300
```

```
Valid_count: 300
```

```
Shutil images: 100%|██████████| 150
0/1500 [00:00<00:00, 1861.23image/s]
```

```
Class_name: dogs
```

```
Train_count: 900
```

```
Test_count: 300
```

```
Valid_count: 300
```

```
Shutil images: 100%|██████████| 150
0/1500 [00:00<00:00, 1801.27image/s]
```

---

```
Выбранная модель: regnet_y_400mf
```

```
Пользовательское название модели: regnet_y_400mf_Exp4
```

```
Выбранный оптимизатор: SGD
```

---

```
Epoch 1/10 (Train): 100%|██████████| 1
17/117 [00:12<00:00, 9.19sample/s]
```

```
Epoch 1/10 (Eval): 100%|██████████| 1
71/71 [00:04<00:00, 17.38sample/s]
```

```
Epoch 1/10, Training Loss: 0.9624175114571191, Validation Loss: 1.0053322073598365
Accuracy: 0.4943502824858757, Precision: 0.493823480637709, Recall: 0.49435028248587
57, F1-score: 0.42961444515337405
```

```
Epoch 2/10 (Train): 100%|██████████| 1
17/117 [00:12<00:00, 9.20sample/s]
```

```
Epoch 2/10 (Eval): 100%|██████████| 1
71/71 [00:04<00:00, 17.60sample/s]
```

```
Epoch 2/10, Training Loss: 0.9431815835978578, Validation Loss: 0.9240479689870177
Accuracy: 0.5050847457627119, Precision: 0.5044705018326953, Recall: 0.505084745762
119, F1-score: 0.492186256824244
```

```
Epoch 3/10 (Train): 100%|██████████| 1
17/117 [00:12<00:00, 9.13sample/s]
```

```
Epoch 3/10 (Eval): 100%|██████████| 1
71/71 [00:04<00:00, 16.30sample/s]
```

```
Epoch 3/10, Training Loss: 0.9329938173416626, Validation Loss: 1.0240176538963102
Accuracy: 0.496045197740113, Precision: 0.4970043832859254, Recall: 0.49604519774011
3, F1-score: 0.4609591715218301
```

```
Epoch 4/10 (Train): 100%|██████████| 1
17/117 [00:13<00:00, 8.98sample/s]
```

```
Epoch 4/10 (Eval): 100%|██████████| 1
71/71 [00:04<00:00, 17.19sample/s]
```

Epoch 4/10, Training Loss: 0.9506636852062753, Validation Loss: 1.0628227643710746  
Accuracy: 0.5045197740112994, Precision: 0.50540526661625, Recall: 0.504519774011299  
4, F1-score: 0.4022900552677649

Epoch 5/10 (Train): 100% | 1  
17/117 [00:12<00:00, 9.04sample/s]  
Epoch 5/10 (Eval): 100% |  
71/71 [00:04<00:00, 17.26sample/s]

Epoch 00005: reducing learning rate of group 0 to 1.0000e-04.

Epoch 5/10, Training Loss: 0.9468367432101774, Validation Loss: 1.025931001972344  
Accuracy: 0.496045197740113, Precision: 0.4941138255665675, Recall: 0.49604519774011  
3, F1-score: 0.3580273698305628

Epoch 6/10 (Train): 100% | 1  
17/117 [00:12<00:00, 9.01sample/s]  
Epoch 6/10 (Eval): 100% |  
71/71 [00:04<00:00, 16.89sample/s]

Epoch 6/10, Training Loss: 0.8201745722782456, Validation Loss: 0.850194647487274  
Accuracy: 0.5327683615819209, Precision: 0.5358312382586636, Recall: 0.5327683615819  
209, F1-score: 0.5256498536907307

Epoch 7/10 (Train): 100% | 1  
17/117 [00:12<00:00, 9.04sample/s]  
Epoch 7/10 (Eval): 100% |  
71/71 [00:04<00:00, 17.68sample/s]

Epoch 7/10, Training Loss: 0.8224579681469366, Validation Loss: 0.8848801352883463  
Accuracy: 0.5242937853107345, Precision: 0.5267795478030745, Recall: 0.5242937853107  
345, F1-score: 0.517113837198583

Epoch 8/10 (Train): 100% | 1  
17/117 [00:12<00:00, 9.34sample/s]  
Epoch 8/10 (Eval): 100% |  
71/71 [00:04<00:00, 17.69sample/s]

Epoch 8/10, Training Loss: 0.8214814362663206, Validation Loss: 0.8760935111907916  
Accuracy: 0.5152542372881356, Precision: 0.5156789309679034, Recall: 0.5152542372881  
356, F1-score: 0.5144112755580477

Epoch 9/10 (Train): 100% | 1  
17/117 [00:12<00:00, 9.27sample/s]  
Epoch 9/10 (Eval): 100% |  
71/71 [00:04<00:00, 17.57sample/s]

Epoch 00009: reducing learning rate of group 0 to 1.0000e-05.

Epoch 9/10, Training Loss: 0.8155705750683059, Validation Loss: 0.8735316242538603  
Accuracy: 0.536723163841808, Precision: 0.5390127200714351, Recall: 0.53672316384180  
8, F1-score: 0.53210532063603

Epoch 10/10 (Train): 100% | 1  
17/117 [00:12<00:00, 9.29sample/s]  
Epoch 10/10 (Eval): 100% |  
71/71 [00:04<00:00, 17.16sample/s]

Epoch 10/10, Training Loss: 0.808019135772896, Validation Loss: 0.9020934389472681  
Accuracy: 0.5344632768361582, Precision: 0.5348370531439404, Recall: 0.5344632768361  
582, F1-score: 0.5340350051068415

Тренировка завершена!

Test: 100% |  
72/72 [00:04<00:00, 16.33sample/s]

```
Test Accuracy: 0.5373467112597548
Precision: 0.537265286429166, Recall: 0.5373467112597548, F1-score: 0.53713497062417
57
Accuracy of cats : 51 %
Accuracy of dogs : 55 %
```

```
Class_name: cats
```

```
Train_count: 900
```

```
Test_count: 300
```

```
Valid_count: 300
```

```
Shutil images: 100%|██████████| 150
0/1500 [00:00<00:00, 1832.93image/s]
```

```
Class_name: dogs
```

```
Train_count: 900
```

```
Test_count: 300
```

```
Valid_count: 300
```

```
Shutil images: 100%|██████████| 150
0/1500 [00:00<00:00, 1855.36image/s]
```

---

```
Выбранная модель: regnet_y_800mf
```

```
Пользовательское название модели: regnet_y_800mf_Exp4
```

```
Выбранный оптимизатор: SGD
```

---

```
Epoch 1/10 (Train): 100%|██████████| 1
17/117 [00:12<00:00, 9.45sample/s]
```

```
Epoch 1/10 (Eval): 100%|██████████| 1
71/71 [00:03<00:00, 19.45sample/s]
```

```
Epoch 1/10, Training Loss: 0.8530573682314406, Validation Loss: 0.8839764999131025
Accuracy: 0.49887005649717514, Precision: 0.49932106537530263, Recall: 0.49887005649
717514, F1-score: 0.49675234980431016
```

```
Epoch 2/10 (Train): 100%|██████████| 1
17/117 [00:12<00:00, 9.53sample/s]
```

```
Epoch 2/10 (Eval): 100%|██████████| 1
71/71 [00:03<00:00, 19.42sample/s]
```

```
Epoch 2/10, Training Loss: 0.844247259776669, Validation Loss: 0.8508382355425991
Accuracy: 0.5107344632768361, Precision: 0.5114072808679495, Recall: 0.5107344632768
361, F1-score: 0.5086305336745467
```

```
Epoch 3/10 (Train): 100%|██████████| 1
17/117 [00:12<00:00, 9.36sample/s]
```

```
Epoch 3/10 (Eval): 100%|██████████| 1
71/71 [00:03<00:00, 19.36sample/s]
```

```
Epoch 3/10, Training Loss: 0.8414134273715342, Validation Loss: 0.8078461385379403
Accuracy: 0.5163841807909605, Precision: 0.5194234770519905, Recall: 0.5163841807909
605, F1-score: 0.504171241696765
```

```
Epoch 4/10 (Train): 100%|██████████| 1
17/117 [00:12<00:00, 9.32sample/s]
```

```
Epoch 4/10 (Eval): 100%|██████████| 1
71/71 [00:03<00:00, 18.45sample/s]
```

Epoch 4/10, Training Loss: 0.8440394144992946, Validation Loss: 0.81711583538244  
Accuracy: 0.5372881355932203, Precision: 0.5458678770292771, Recall: 0.5372881355932  
203, F1-score: 0.50977799510834

Epoch 5/10 (Train): 100% | ██████████ | 1  
17/117 [00:12<00:00, 9.06sample/s]

Epoch 5/10 (Eval): 100% | ██████████ |  
71/71 [00:03<00:00, 18.64sample/s]

Epoch 5/10, Training Loss: 0.8109559103632071, Validation Loss: 0.8825886710888922  
Accuracy: 0.5220338983050847, Precision: 0.5810701890659723, Recall: 0.5220338983050  
847, F1-score: 0.4224588526727509

Epoch 6/10 (Train): 100% | ██████████ | 1  
17/117 [00:12<00:00, 9.24sample/s]

Epoch 6/10 (Eval): 100% | ██████████ |  
71/71 [00:03<00:00, 18.98sample/s]

Epoch 6/10, Training Loss: 0.8281868026835041, Validation Loss: 0.7876245246431922  
Accuracy: 0.5559322033898305, Precision: 0.5584037165216065, Recall: 0.5559322033898  
305, F1-score: 0.5494687459019362

Epoch 7/10 (Train): 100% | ██████████ | 1  
17/117 [00:12<00:00, 9.10sample/s]

Epoch 7/10 (Eval): 100% | ██████████ |  
71/71 [00:03<00:00, 17.87sample/s]

Epoch 7/10, Training Loss: 0.8183990355997236, Validation Loss: 0.8125626859018358  
Accuracy: 0.5378531073446328, Precision: 0.5398153199316779, Recall: 0.5378531073446  
328, F1-score: 0.5291943512357565

Epoch 8/10 (Train): 100% | ██████████ | 1  
17/117 [00:12<00:00, 9.18sample/s]

Epoch 8/10 (Eval): 100% | ██████████ |  
71/71 [00:03<00:00, 19.48sample/s]

Epoch 8/10, Training Loss: 0.8198371532847409, Validation Loss: 0.9195728387873051  
Accuracy: 0.5045197740112994, Precision: 0.5211208778393119, Recall: 0.5045197740112  
994, F1-score: 0.3512126745765199

Epoch 9/10 (Train): 100% | ██████████ | 1  
17/117 [00:12<00:00, 9.50sample/s]

Epoch 9/10 (Eval): 100% | ██████████ |  
71/71 [00:03<00:00, 19.09sample/s]

Epoch 00009: reducing learning rate of group 0 to 1.0000e-04.

Epoch 9/10, Training Loss: 0.8085585750685398, Validation Loss: 0.8460027033326316  
Accuracy: 0.5096045197740113, Precision: 0.5276649444534411, Recall: 0.5096045197740  
113, F1-score: 0.39398165393928103

Epoch 10/10 (Train): 100% | ██████████ | 1  
17/117 [00:12<00:00, 9.53sample/s]

Epoch 10/10 (Eval): 100% | ██████████ |  
71/71 [00:03<00:00, 19.34sample/s]

Epoch 10/10, Training Loss: 0.7868958273066324, Validation Loss: 0.7903378178170846  
Accuracy: 0.5316384180790961, Precision: 0.5344167412866854, Recall: 0.5316384180790  
961, F1-score: 0.5176792083288922

Тренировка завершена!

Test: 100% | ██████████ |  
72/72 [00:03<00:00, 18.06sample/s]

```
Test Accuracy: 0.5362318840579711
Precision: 0.5430395235848103, Recall: 0.5362318840579711, F1-score: 0.5215068619785
483
Accuracy of cats : 71 %
Accuracy of dogs : 36 %
```

```
Class_name: cats
Train_count: 900
Test_count: 300
Valid_count: 300
```

```
Shutil images: 100%|██████████| 150
0/1500 [00:00<00:00, 1869.15image/s]
```

```
Class_name: dogs
Train_count: 900
Test_count: 300
Valid_count: 300
```

```
Shutil images: 100%|██████████| 150
0/1500 [00:00<00:00, 1825.45image/s]
```

---

```
-----  
Выбранная модель: regnet_y_8gf
Пользовательское название модели: regnet_y_8gf_Exp4
Выбранный оптимизатор: SGD
```

---

```
Epoch 1/10 (Train): 100%|██████████| 1
17/117 [00:14<00:00, 8.02sample/s]
Epoch 1/10 (Eval): 100%|██████████| 1
71/71 [00:04<00:00, 17.31sample/s]
```

```
Epoch 1/10, Training Loss: 0.8536187013262669, Validation Loss: 0.9066723858737676
Accuracy: 0.4915254237288136, Precision: 0.4897080356483542, Recall: 0.4915254237288
136, F1-score: 0.4386117767025737
```

```
Epoch 2/10 (Train): 100%|██████████| 1
17/117 [00:14<00:00, 8.08sample/s]
Epoch 2/10 (Eval): 100%|██████████| 1
71/71 [00:04<00:00, 17.30sample/s]
```

```
Epoch 2/10, Training Loss: 0.8387774469470063, Validation Loss: 0.8503508542553854
Accuracy: 0.5, Precision: 0.5002500820782205, Recall: 0.5, F1-score: 0.4994496965104
209
```

```
Epoch 3/10 (Train): 100%|██████████| 1
17/117 [00:14<00:00, 8.06sample/s]
Epoch 3/10 (Eval): 100%|██████████| 1
71/71 [00:04<00:00, 17.38sample/s]
```

```
Epoch 3/10, Training Loss: 0.8514599765384745, Validation Loss: 0.9098760563101472
Accuracy: 0.5327683615819209, Precision: 0.5480414291488913, Recall: 0.5327683615819
209, F1-score: 0.4860755916917794
```

```
Epoch 4/10 (Train): 100%|██████████| 1
17/117 [00:14<00:00, 8.02sample/s]
Epoch 4/10 (Eval): 100%|██████████| 1
71/71 [00:04<00:00, 16.77sample/s]
```

Epoch 4/10, Training Loss: 0.8465416086627001, Validation Loss: 0.8692647068850738  
Accuracy: 0.5124293785310734, Precision: 0.5327013176072134, Recall: 0.5124293785310734, F1-score: 0.4070938508834633

Epoch 5/10 (Train): 100% | [██████████] | 1  
17/117 [00:15<00:00, 7.61sample/s]

Epoch 5/10 (Eval): 100% | [██████████] |  
71/71 [00:04<00:00, 16.05sample/s]

Epoch 5/10, Training Loss: 0.8378787901280594, Validation Loss: 0.8435719503184497  
Accuracy: 0.5361581920903955, Precision: 0.5384910140502261, Recall: 0.5361581920903955, F1-score: 0.5313739846124181

Epoch 6/10 (Train): 100% | [██████████] | 1  
17/117 [00:15<00:00, 7.60sample/s]

Epoch 6/10 (Eval): 100% | [██████████] |  
71/71 [00:04<00:00, 16.78sample/s]

Epoch 6/10, Training Loss: 0.8445567439850917, Validation Loss: 0.8723805513927492  
Accuracy: 0.5288135593220339, Precision: 0.5640716439429526, Recall: 0.5288135593220339, F1-score: 0.4601581188116657

Epoch 7/10 (Train): 100% | [██████████] | 1  
17/117 [00:15<00:00, 7.70sample/s]

Epoch 7/10 (Eval): 100% | [██████████] |  
71/71 [00:04<00:00, 17.14sample/s]

Epoch 7/10, Training Loss: 0.826131381160842, Validation Loss: 1.0299143259134669  
Accuracy: 0.519774011299435, Precision: 0.6280795253048569, Recall: 0.519774011299435, F1-score: 0.3855368661269199

Epoch 8/10 (Train): 100% | [██████████] | 1  
17/117 [00:15<00:00, 7.76sample/s]

Epoch 8/10 (Eval): 100% | [██████████] |  
71/71 [00:04<00:00, 16.95sample/s]

Epoch 00008: reducing learning rate of group 0 to 1.0000e-04.

Epoch 8/10, Training Loss: 0.813072482554205, Validation Loss: 0.8460708700836042  
Accuracy: 0.5423728813559322, Precision: 0.5958120520077643, Recall: 0.5423728813559322, F1-score: 0.4634445822995157

Epoch 9/10 (Train): 100% | [██████████] | 1  
17/117 [00:15<00:00, 7.77sample/s]

Epoch 9/10 (Eval): 100% | [██████████] |  
71/71 [00:04<00:00, 17.23sample/s]

Epoch 9/10, Training Loss: 0.7910559765274513, Validation Loss: 0.8381865006045434  
Accuracy: 0.588135593220339, Precision: 0.5881731047893276, Recall: 0.588135593220339, F1-score: 0.5881391427657853

Epoch 10/10 (Train): 100% | [██████████] | 1  
17/117 [00:15<00:00, 7.79sample/s]

Epoch 10/10 (Eval): 100% | [██████████] |  
71/71 [00:04<00:00, 16.82sample/s]

Epoch 10/10, Training Loss: 0.7662412795283519, Validation Loss: 0.833583116026248  
Accuracy: 0.5728813559322034, Precision: 0.5740652874468032, Recall: 0.5728813559322034, F1-score: 0.5717794824075608

Тренировка завершена!

Test: 100% | [██████████] |  
72/72 [00:04<00:00, 15.56sample/s]

```
Test Accuracy: 0.5819397993311036
Precision: 0.5822542909499432, Recall: 0.5819397993311036, F1-score: 0.5810490726991
95
Accuracy of cats : 53 %
Accuracy of dogs : 62 %
```

```
Class_name: cats
```

```
Train_count: 900
```

```
Test_count: 300
```

```
Valid_count: 300
```

```
Shutil images: 100%|██████████| 150
0/1500 [00:00<00:00, 1803.09image/s]
```

```
Class_name: dogs
```

```
Train_count: 900
```

```
Test_count: 300
```

```
Valid_count: 300
```

```
Shutil images: 100%|██████████| 150
0/1500 [00:00<00:00, 1781.79image/s]
```

---

```
-----
```

Выбранная модель: resnet101

Пользовательское название модели: resnet101\_Exp4

Выбранный оптимизатор: SGD

```
-----
```

```
Epoch 1/10 (Train): 100%|██████████| 1
17/117 [00:17<00:00, 6.85sample/s]
Epoch 1/10 (Eval): 100%|██████████| 1
71/71 [00:04<00:00, 16.37sample/s]
```

```
Epoch 1/10, Training Loss: 1.6792918458591184, Validation Loss: 1.2313021116253346
Accuracy: 0.5107344632768361, Precision: 0.5654910791264746, Recall: 0.5107344632768
361, F1-score: 0.391008308408109
```

```
Epoch 2/10 (Train): 100%|██████████| 1
17/117 [00:16<00:00, 6.96sample/s]
Epoch 2/10 (Eval): 100%|██████████| 1
71/71 [00:04<00:00, 16.81sample/s]
```

```
Epoch 2/10, Training Loss: 1.6134365136652797, Validation Loss: 1.1596011068187864
Accuracy: 0.5033898305084745, Precision: 0.5559322033898305, Recall: 0.5033898305084
745, F1-score: 0.3635516242354686
```

```
Epoch 3/10 (Train): 100%|██████████| 1
17/117 [00:16<00:00, 7.01sample/s]
Epoch 3/10 (Eval): 100%|██████████| 1
71/71 [00:04<00:00, 16.40sample/s]
```

```
Epoch 3/10, Training Loss: 1.6580734593031585, Validation Loss: 0.8844368840846638
Accuracy: 0.5141242937853108, Precision: 0.5165689389859833, Recall: 0.5141242937853
108, F1-score: 0.48144407890170604
```

```
Epoch 4/10 (Train): 100%|██████████| 1
17/117 [00:16<00:00, 6.90sample/s]
Epoch 4/10 (Eval): 100%|██████████| 1
71/71 [00:04<00:00, 16.79sample/s]
```

Epoch 4/10, Training Loss: 1.6198675671491498, Validation Loss: 1.6294446001197658  
Accuracy: 0.5033898305084745, Precision: 0.25340132145935074, Recall: 0.5033898305084745, F1-score: 0.3371066057745591

Epoch 5/10 (Train): 100% | [██████████] | 1  
17/117 [00:16<00:00, 7.01sample/s]

Epoch 5/10 (Eval): 100% | [██████████] |  
71/71 [00:04<00:00, 16.62sample/s]

Epoch 5/10, Training Loss: 1.4517109827116141, Validation Loss: 1.1496375078956287  
Accuracy: 0.5384180790960452, Precision: 0.5742017432049598, Recall: 0.5384180790960452, F1-score: 0.4802118604100993

Epoch 6/10 (Train): 100% | [██████████] | 1  
17/117 [00:16<00:00, 7.02sample/s]

Epoch 6/10 (Eval): 100% | [██████████] |  
71/71 [00:04<00:00, 17.02sample/s]

Epoch 00006: reducing learning rate of group 0 to 1.0000e-04.

Epoch 6/10, Training Loss: 1.2587099192974256, Validation Loss: 0.9640614351647049  
Accuracy: 0.5305084745762711, Precision: 0.5973308938886925, Recall: 0.5305084745762711, F1-score: 0.43865133210895146

Epoch 7/10 (Train): 100% | [██████████] | 1  
17/117 [00:16<00:00, 7.20sample/s]

Epoch 7/10 (Eval): 100% | [██████████] |  
71/71 [00:04<00:00, 16.96sample/s]

Epoch 7/10, Training Loss: 0.8392110449798799, Validation Loss: 0.8362556690044995  
Accuracy: 0.5463276836158192, Precision: 0.5658123433229706, Recall: 0.5463276836158192, F1-score: 0.5139901824249569

Epoch 8/10 (Train): 100% | [██████████] | 1  
17/117 [00:16<00:00, 6.92sample/s]

Epoch 8/10 (Eval): 100% | [██████████] |  
71/71 [00:04<00:00, 16.56sample/s]

Epoch 8/10, Training Loss: 0.8163883509784631, Validation Loss: 0.8174915035902444  
Accuracy: 0.556497175141243, Precision: 0.5765018506469265, Recall: 0.556497175141243, F1-score: 0.52859680605405

Epoch 9/10 (Train): 100% | [██████████] | 1  
17/117 [00:16<00:00, 6.95sample/s]

Epoch 9/10 (Eval): 100% | [██████████] |  
71/71 [00:04<00:00, 16.71sample/s]

Epoch 9/10, Training Loss: 0.8304641685353475, Validation Loss: 0.8043171027622654  
Accuracy: 0.5372881355932203, Precision: 0.5389783658395573, Recall: 0.5372881355932203, F1-score: 0.5294093260196827

Epoch 10/10 (Train): 100% | [██████████] | 1  
17/117 [00:16<00:00, 6.94sample/s]

Epoch 10/10 (Eval): 100% | [██████████] |  
71/71 [00:04<00:00, 16.36sample/s]

Epoch 10/10, Training Loss: 0.7995626295854819, Validation Loss: 0.8187999623475102  
Accuracy: 0.5440677966101695, Precision: 0.5717183565703415, Recall: 0.5440677966101695, F1-score: 0.4998214239184999

Тренировка завершена!

Test: 100% | [██████████] |  
72/72 [00:04<00:00, 14.85sample/s]

```
Test Accuracy: 0.5434782608695652
Precision: 0.5663856206265441, Recall: 0.5434782608695652, F1-score: 0.4948459880287
5446
Accuracy of cats : 23 %
Accuracy of dogs : 85 %
```

```
Class_name: cats
```

```
Train_count: 900
```

```
Test_count: 300
```

```
Valid_count: 300
```

```
Shutil images: 100%|██████████| 150
0/1500 [00:00<00:00, 1802.67image/s]
```

```
Class_name: dogs
```

```
Train_count: 900
```

```
Test_count: 300
```

```
Valid_count: 300
```

```
Shutil images: 100%|██████████| 150
0/1500 [00:00<00:00, 1776.03image/s]
```

---

```
Выбранная модель: resnet152
```

```
Пользовательское название модели: resnet152_Exp4
```

```
Выбранный оптимизатор: SGD
```

---

```
Epoch 1/10 (Train): 100%|██████████| 1
17/117 [00:23<00:00, 5.04sample/s]
Epoch 1/10 (Eval): 100%|██████████| 1
71/71 [00:05<00:00, 13.14sample/s]
```

```
Epoch 1/10, Training Loss: 1.5217034732993129, Validation Loss: 1.3394279733594865
Accuracy: 0.5050847457627119, Precision: 0.6082985953625333, Recall: 0.5050847457627119, F1-score: 0.3573677449987213
```

```
Epoch 2/10 (Train): 100%|██████████| 1
17/117 [00:22<00:00, 5.12sample/s]
Epoch 2/10 (Eval): 100%|██████████| 1
71/71 [00:05<00:00, 13.18sample/s]
```

```
Epoch 2/10, Training Loss: 1.4761067458911659, Validation Loss: 1.375885827729931
Accuracy: 0.5033898305084745, Precision: 0.5431476997578693, Recall: 0.5033898305084745, F1-score: 0.37030377368579576
```

```
Epoch 3/10 (Train): 100%|██████████| 1
17/117 [00:23<00:00, 5.07sample/s]
Epoch 3/10 (Eval): 100%|██████████| 1
71/71 [00:05<00:00, 12.96sample/s]
```

```
Epoch 3/10, Training Loss: 1.3536009856329299, Validation Loss: 0.8302700977540959
Accuracy: 0.5435028248587571, Precision: 0.5501601366757123, Recall: 0.5435028248587571, F1-score: 0.5242353476411972
```

```
Epoch 4/10 (Train): 100%|██████████| 1
17/117 [00:23<00:00, 5.06sample/s]
Epoch 4/10 (Eval): 100%|██████████| 1
71/71 [00:05<00:00, 13.03sample/s]
```

Epoch 4/10, Training Loss: 1.3615045906481797, Validation Loss: 2.8525577648884832  
Accuracy: 0.4966101694915254, Precision: 0.2466216604424016, Recall: 0.4966101694915  
254, F1-score: 0.329573679866403

Epoch 5/10 (Train): 100% | ██████████ | 1  
17/117 [00:23<00:00, 4.99sample/s]  
Epoch 5/10 (Eval): 100% | ██████████ |  
71/71 [00:05<00:00, 12.68sample/s]

Epoch 5/10, Training Loss: 1.1807356198778538, Validation Loss: 1.4040674342442367  
Accuracy: 0.4977401129943503, Precision: 0.7502904747296573, Recall: 0.4977401129943  
503, F1-score: 0.33207752229346776

Epoch 6/10 (Train): 100% | ██████████ | 1  
17/117 [00:23<00:00, 5.07sample/s]  
Epoch 6/10 (Eval): 100% | ██████████ |  
71/71 [00:05<00:00, 13.60sample/s]

Epoch 00006: reducing learning rate of group 0 to 1.0000e-04.

Epoch 6/10, Training Loss: 1.2170726919803332, Validation Loss: 0.8550673299758448  
Accuracy: 0.5502824858757062, Precision: 0.5805182758888805, Recall: 0.5502824858757  
062, F1-score: 0.507540995377362

Epoch 7/10 (Train): 100% | ██████████ | 1  
17/117 [00:22<00:00, 5.09sample/s]  
Epoch 7/10 (Eval): 100% | ██████████ |  
71/71 [00:05<00:00, 13.82sample/s]

Epoch 7/10, Training Loss: 0.8180707010853527, Validation Loss: 0.7766566007150768  
Accuracy: 0.5322033898305085, Precision: 0.5323953692701298, Recall: 0.5322033898305  
085, F1-score: 0.5296703459370707

Epoch 8/10 (Train): 100% | ██████████ | 1  
17/117 [00:22<00:00, 5.17sample/s]  
Epoch 8/10 (Eval): 100% | ██████████ |  
71/71 [00:05<00:00, 13.87sample/s]

Epoch 8/10, Training Loss: 0.8052497949601853, Validation Loss: 0.7923140924865917  
Accuracy: 0.5423728813559322, Precision: 0.5529773496770332, Recall: 0.5423728813559  
322, F1-score: 0.521966853410401

Epoch 9/10 (Train): 100% | ██████████ | 1  
17/117 [00:22<00:00, 5.13sample/s]  
Epoch 9/10 (Eval): 100% | ██████████ |  
71/71 [00:05<00:00, 13.52sample/s]

Epoch 9/10, Training Loss: 0.8034609780073002, Validation Loss: 0.7788285148345818  
Accuracy: 0.572316384180791, Precision: 0.5915405626342916, Recall: 0.57231638418079  
1, F1-score: 0.5508826676321039

Epoch 10/10 (Train): 100% | ██████████ | 1  
17/117 [00:22<00:00, 5.25sample/s]  
Epoch 10/10 (Eval): 100% | ██████████ |  
71/71 [00:05<00:00, 13.84sample/s]

Epoch 10/10, Training Loss: 0.8005706195434207, Validation Loss: 0.771104106458567  
Accuracy: 0.5638418079096045, Precision: 0.5703640476436223, Recall: 0.5638418079096  
045, F1-score: 0.5552641577754299

Тренировка завершена!

Test: 100% | ██████████ |  
72/72 [00:05<00:00, 13.37sample/s]

```
Test Accuracy: 0.5551839464882943
Precision: 0.5585896346938276, Recall: 0.5551839464882943, F1-score: 0.5462996833581
073
Accuracy of cats : 41 %
Accuracy of dogs : 69 %
```

```
Class_name: cats
```

```
Train_count: 900
```

```
Test_count: 300
```

```
Valid_count: 300
```

```
Shutil images: 100%|██████████| 150
0/1500 [00:00<00:00, 1830.60image/s]
```

```
Class_name: dogs
```

```
Train_count: 900
```

```
Test_count: 300
```

```
Valid_count: 300
```

```
Shutil images: 100%|██████████| 150
0/1500 [00:00<00:00, 1762.85image/s]
```

---

```
-----
```

Выбранная модель: resnet18

Пользовательское название модели: resnet18\_Exp4

Выбранный оптимизатор: SGD

```
-----
```

```
Epoch 1/10 (Train): 100%|██████████| 1
17/117 [00:08<00:00, 14.53sample/s]
Epoch 1/10 (Eval): 100%|██████████| 1
71/71 [00:03<00:00, 22.84sample/s]
```

```
Epoch 1/10, Training Loss: 0.8272312929403136, Validation Loss: 0.7915636620952584
Accuracy: 0.5361581920903955, Precision: 0.5374089758907256, Recall: 0.5361581920903
955, F1-score: 0.5339137897698152
```

```
Epoch 2/10 (Train): 100%|██████████| 1
17/117 [00:08<00:00, 14.57sample/s]
Epoch 2/10 (Eval): 100%|██████████| 1
71/71 [00:03<00:00, 22.99sample/s]
```

```
Epoch 2/10, Training Loss: 0.8093416517200823, Validation Loss: 0.7509622993105549
Accuracy: 0.5830508474576271, Precision: 0.5831566589392418, Recall: 0.5830508474576
271, F1-score: 0.5826377700397474
```

```
Epoch 3/10 (Train): 100%|██████████| 1
17/117 [00:08<00:00, 14.46sample/s]
Epoch 3/10 (Eval): 100%|██████████| 1
71/71 [00:03<00:00, 23.25sample/s]
```

```
Epoch 3/10, Training Loss: 0.7692957875293931, Validation Loss: 0.7617860271432305
Accuracy: 0.5954802259887005, Precision: 0.6180207903126106, Recall: 0.5954802259887
005, F1-score: 0.5734479115051057
```

```
Epoch 4/10 (Train): 100%|██████████| 1
17/117 [00:08<00:00, 14.50sample/s]
Epoch 4/10 (Eval): 100%|██████████| 1
71/71 [00:03<00:00, 22.92sample/s]
```

Epoch 4/10, Training Loss: 0.7599861868813562, Validation Loss: 0.736602274543148  
Accuracy: 0.6016949152542372, Precision: 0.6502099666252209, Recall: 0.6016949152542  
372, F1-score: 0.5647815339621607

Epoch 5/10 (Train): 100% | ██████████ | 1  
17/117 [00:08<00:00, 14.44sample/s]  
Epoch 5/10 (Eval): 100% | ██████████ |  
71/71 [00:03<00:00, 22.97sample/s]

Epoch 5/10, Training Loss: 0.7494581660601765, Validation Loss: 0.7040438226050576  
Accuracy: 0.6423728813559322, Precision: 0.642591854723832, Recall: 0.64237288135593  
22, F1-score: 0.6421026507123464

Epoch 6/10 (Train): 100% | ██████████ | 1  
17/117 [00:08<00:00, 14.57sample/s]  
Epoch 6/10 (Eval): 100% | ██████████ |  
71/71 [00:03<00:00, 22.42sample/s]

Epoch 6/10, Training Loss: 0.731822164439436, Validation Loss: 0.6983101763630991  
Accuracy: 0.6502824858757063, Precision: 0.6539263511500651, Recall: 0.650282485875  
063, F1-score: 0.6477891438466555

Epoch 7/10 (Train): 100% | ██████████ | 1  
17/117 [00:08<00:00, 14.49sample/s]  
Epoch 7/10 (Eval): 100% | ██████████ |  
71/71 [00:03<00:00, 22.95sample/s]

Epoch 7/10, Training Loss: 0.7239501284278362, Validation Loss: 0.7226285477310924  
Accuracy: 0.6310734463276836, Precision: 0.6900610700902708, Recall: 0.6310734463276  
836, F1-score: 0.5985980339714612

Epoch 8/10 (Train): 100% | ██████████ | 1  
17/117 [00:08<00:00, 13.65sample/s]  
Epoch 8/10 (Eval): 100% | ██████████ |  
71/71 [00:03<00:00, 22.63sample/s]

Epoch 8/10, Training Loss: 0.722893289971466, Validation Loss: 0.6622193276377047  
Accuracy: 0.6802259887005649, Precision: 0.7032768710110292, Recall: 0.6802259887005  
649, F1-score: 0.671543198330557

Epoch 9/10 (Train): 100% | ██████████ | 1  
17/117 [00:08<00:00, 14.46sample/s]  
Epoch 9/10 (Eval): 100% | ██████████ |  
71/71 [00:03<00:00, 23.32sample/s]

Epoch 9/10, Training Loss: 0.7089261426714857, Validation Loss: 0.6473697638612682  
Accuracy: 0.6977401129943502, Precision: 0.7091810611453264, Recall: 0.6977401129943  
502, F1-score: 0.6939552497058644

Epoch 10/10 (Train): 100% | ██████████ | 1  
17/117 [00:07<00:00, 14.96sample/s]  
Epoch 10/10 (Eval): 100% | ██████████ |  
71/71 [00:02<00:00, 23.90sample/s]

Epoch 10/10, Training Loss: 0.7098470979393795, Validation Loss: 0.6341895072978768  
Accuracy: 0.7129943502824859, Precision: 0.7221426497030963, Recall: 0.7129943502824  
859, F1-score: 0.7103272155738872

Тренировка завершена!

Test: 100% | ██████████ |  
72/72 [00:03<00:00, 18.09sample/s]

```
Test Accuracy: 0.7251950947603122
Precision: 0.7354483960761455, Recall: 0.7251950947603122, F1-score: 0.7218076281935
927
Accuracy of cats : 61 %
Accuracy of dogs : 83 %
```

```
Class_name: cats
```

```
Train_count: 900
```

```
Test_count: 300
```

```
Valid_count: 300
```

```
Shutil images: 100%|██████████| 150
0/1500 [00:00<00:00, 1784.56image/s]
```

```
Class_name: dogs
```

```
Train_count: 900
```

```
Test_count: 300
```

```
Valid_count: 300
```

```
Shutil images: 100%|██████████| 150
0/1500 [00:00<00:00, 1781.26image/s]
```

---

```
Выбранная модель: resnet34
```

```
Пользовательское название модели: resnet34_Exp4
```

```
Выбранный оптимизатор: SGD
```

---

```
Epoch 1/10 (Train): 100%|██████████| 1
17/117 [00:09<00:00, 12.33sample/s]
```

```
Epoch 1/10 (Eval): 100%|██████████| 1
71/71 [00:03<00:00, 21.64sample/s]
```

```
Epoch 1/10, Training Loss: 0.8466860595796923, Validation Loss: 0.8090877142329674
Accuracy: 0.5271186440677966, Precision: 0.5398034886201805, Recall: 0.5271186440677
966, F1-score: 0.49277671390493794
```

```
Epoch 2/10 (Train): 100%|██████████| 1
17/117 [00:09<00:00, 12.75sample/s]
```

```
Epoch 2/10 (Eval): 100%|██████████| 1
71/71 [00:03<00:00, 22.00sample/s]
```

```
Epoch 2/10, Training Loss: 0.8323042666037823, Validation Loss: 0.8477819412946701
Accuracy: 0.5169491525423728, Precision: 0.5528077741055596, Recall: 0.5169491525423
728, F1-score: 0.40772838245838305
```

```
Epoch 3/10 (Train): 100%|██████████| 1
17/117 [00:09<00:00, 12.42sample/s]
```

```
Epoch 3/10 (Eval): 100%|██████████| 1
71/71 [00:03<00:00, 21.80sample/s]
```

```
Epoch 3/10, Training Loss: 0.8142113484610753, Validation Loss: 0.7670583463994797
Accuracy: 0.5587570621468927, Precision: 0.5588033231765378, Recall: 0.5587570621468
927, F1-score: 0.5587586114060026
```

```
Epoch 4/10 (Train): 100%|██████████| 1
17/117 [00:09<00:00, 12.83sample/s]
```

```
Epoch 4/10 (Eval): 100%|██████████| 1
71/71 [00:03<00:00, 21.38sample/s]
```

Epoch 4/10, Training Loss: 0.8026930934317394, Validation Loss: 0.8783356099478943  
Accuracy: 0.5112994350282486, Precision: 0.60119260762314, Recall: 0.5112994350282486, F1-score: 0.37869715509378526

Epoch 5/10 (Train): 100% | ██████████ | 1  
17/117 [00:09<00:00, 12.45sample/s]  
Epoch 5/10 (Eval): 100% | ██████████ |  
71/71 [00:03<00:00, 21.54sample/s]

Epoch 5/10, Training Loss: 0.8162515042905043, Validation Loss: 0.7582293643621402  
Accuracy: 0.5655367231638418, Precision: 0.5834954441337024, Recall: 0.5655367231638418, F1-score: 0.5381089241806585

Epoch 6/10 (Train): 100% | ██████████ | 1  
17/117 [00:09<00:00, 12.72sample/s]  
Epoch 6/10 (Eval): 100% | ██████████ |  
71/71 [00:03<00:00, 21.99sample/s]

Epoch 6/10, Training Loss: 0.7792752494012926, Validation Loss: 0.8330262218323131  
Accuracy: 0.5220338983050847, Precision: 0.5948621444800574, Recall: 0.5220338983050847, F1-score: 0.40192885345348517

Epoch 7/10 (Train): 100% | ██████████ | 1  
17/117 [00:09<00:00, 12.45sample/s]  
Epoch 7/10 (Eval): 100% | ██████████ |  
71/71 [00:03<00:00, 21.46sample/s]

Epoch 7/10, Training Loss: 0.8035462409809405, Validation Loss: 0.770227317840366  
Accuracy: 0.5661016949152542, Precision: 0.602727914483122, Recall: 0.5661016949152542, F1-score: 0.5265696847301524

Epoch 8/10 (Train): 100% | ██████████ | 1  
17/117 [00:09<00:00, 12.63sample/s]  
Epoch 8/10 (Eval): 100% | ██████████ |  
71/71 [00:03<00:00, 21.68sample/s]

Epoch 8/10, Training Loss: 0.7666369818554422, Validation Loss: 0.7311413368936313  
Accuracy: 0.6056497175141243, Precision: 0.6065267362548762, Recall: 0.6056497175141243, F1-score: 0.6051381202208218

Epoch 9/10 (Train): 100% | ██████████ | 1  
17/117 [00:09<00:00, 12.61sample/s]  
Epoch 9/10 (Eval): 100% | ██████████ |  
71/71 [00:03<00:00, 21.85sample/s]

Epoch 9/10, Training Loss: 0.7697255043561856, Validation Loss: 0.7182131308620259  
Accuracy: 0.6209039548022599, Precision: 0.6227245156147101, Recall: 0.6209039548022599, F1-score: 0.6198592161050506

Epoch 10/10 (Train): 100% | ██████████ | 1  
17/117 [00:09<00:00, 12.61sample/s]  
Epoch 10/10 (Eval): 100% | ██████████ |  
71/71 [00:03<00:00, 22.08sample/s]

Epoch 10/10, Training Loss: 0.7657318162215417, Validation Loss: 0.7115014304885756  
Accuracy: 0.6384180790960452, Precision: 0.6402838527102925, Recall: 0.6384180790960452, F1-score: 0.6368618236507456

Тренировка завершена!

Test: 100% | ██████████ |  
72/72 [00:03<00:00, 19.43sample/s]

```
Test Accuracy: 0.6387959866220736
Precision: 0.6409352115315337, Recall: 0.6387959866220736, F1-score: 0.6377861833696
656
Accuracy of cats : 69 %
Accuracy of dogs : 58 %
```

```
Class_name: cats
```

```
Train_count: 900
```

```
Test_count: 300
```

```
Valid_count: 300
```

```
Shutil images: 100%|██████████| 150
0/1500 [00:00<00:00, 1824.93image/s]
```

```
Class_name: dogs
```

```
Train_count: 900
```

```
Test_count: 300
```

```
Valid_count: 300
```

```
Shutil images: 100%|██████████| 150
0/1500 [00:00<00:00, 1734.52image/s]
```

---

```
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```

Выбранная модель: resnet50

Пользовательское название модели: resnet50\_Exp4

Выбранный оптимизатор: SGD

```
-----
```

```
Epoch 1/10 (Train): 100%|██████████| 1
17/117 [00:10<00:00, 11.03sample/s]
Epoch 1/10 (Eval): 100%|██████████| 1
71/71 [00:03<00:00, 21.02sample/s]
```

```
Epoch 1/10, Training Loss: 1.703377346374794, Validation Loss: 1.4667017755998393
Accuracy: 0.4966101694915254, Precision: 0.2466216604424016, Recall: 0.4966101694915
254, F1-score: 0.329573679866403
```

```
Epoch 2/10 (Train): 100%|██████████| 1
17/117 [00:10<00:00, 10.92sample/s]
Epoch 2/10 (Eval): 100%|██████████| 1
71/71 [00:03<00:00, 20.29sample/s]
```

```
Epoch 2/10, Training Loss: 1.8460826573304887, Validation Loss: 2.311173393314778
Accuracy: 0.4966101694915254, Precision: 0.2466216604424016, Recall: 0.4966101694915
254, F1-score: 0.329573679866403
```

```
Epoch 3/10 (Train): 100%|██████████| 1
17/117 [00:10<00:00, 10.81sample/s]
Epoch 3/10 (Eval): 100%|██████████| 1
71/71 [00:03<00:00, 20.93sample/s]
```

```
Epoch 3/10, Training Loss: 1.771127450069881, Validation Loss: 2.0975616960865207
Accuracy: 0.4966101694915254, Precision: 0.2466216604424016, Recall: 0.4966101694915
254, F1-score: 0.329573679866403
```

```
Epoch 4/10 (Train): 100%|██████████| 1
17/117 [00:10<00:00, 11.13sample/s]
Epoch 4/10 (Eval): 100%|██████████| 1
71/71 [00:03<00:00, 20.62sample/s]
```

Epoch 4/10, Training Loss: 1.8164082899373064, Validation Loss: 1.1144137614864413  
Accuracy: 0.49830508474576274, Precision: 0.5202858119753543, Recall: 0.49830508474576274, F1-score: 0.3485645634233613

Epoch 5/10 (Train): 100% | ██████████ | 1  
17/117 [00:10<00:00, 10.82sample/s]  
Epoch 5/10 (Eval): 100% | ██████████ |  
71/71 [00:03<00:00, 20.98sample/s]

Epoch 5/10, Training Loss: 1.718481170122063, Validation Loss: 1.895456657308222  
Accuracy: 0.4966101694915254, Precision: 0.2466216604424016, Recall: 0.4966101694915254, F1-score: 0.329573679866403

Epoch 6/10 (Train): 100% | ██████████ | 1  
17/117 [00:10<00:00, 11.03sample/s]  
Epoch 6/10 (Eval): 100% | ██████████ |  
71/71 [00:03<00:00, 20.84sample/s]

Epoch 6/10, Training Loss: 1.5811551497193377, Validation Loss: 1.1266716718673706  
Accuracy: 0.5022598870056497, Precision: 0.5544282289819736, Recall: 0.5022598870056497, F1-score: 0.35861486062609327

Epoch 7/10 (Train): 100% | ██████████ | 1  
17/117 [00:11<00:00, 10.62sample/s]  
Epoch 7/10 (Eval): 100% | ██████████ |  
71/71 [00:03<00:00, 20.57sample/s]

Epoch 00007: reducing learning rate of group 0 to 1.0000e-04.

Epoch 7/10, Training Loss: 1.716397557154839, Validation Loss: 1.7385975472776398  
Accuracy: 0.4966101694915254, Precision: 0.2466216604424016, Recall: 0.4966101694915254, F1-score: 0.329573679866403

Epoch 8/10 (Train): 100% | ██████████ | 1  
17/117 [00:10<00:00, 10.90sample/s]  
Epoch 8/10 (Eval): 100% | ██████████ |  
71/71 [00:03<00:00, 21.03sample/s]

Epoch 8/10, Training Loss: 0.8473497289472283, Validation Loss: 0.8745249302710517  
Accuracy: 0.5412429378531074, Precision: 0.5604047526858313, Recall: 0.5412429378531074, F1-score: 0.5061962334513848

Epoch 9/10 (Train): 100% | ██████████ | 1  
17/117 [00:10<00:00, 11.15sample/s]  
Epoch 9/10 (Eval): 100% | ██████████ |  
71/71 [00:03<00:00, 21.01sample/s]

Epoch 9/10, Training Loss: 0.8117096907190463, Validation Loss: 0.8048121247251155  
Accuracy: 0.5435028248587571, Precision: 0.5445743715605488, Recall: 0.5435028248587571, F1-score: 0.5419272330646964

Epoch 10/10 (Train): 100% | ██████████ | 1  
17/117 [00:10<00:00, 11.08sample/s]  
Epoch 10/10 (Eval): 100% | ██████████ |  
71/71 [00:03<00:00, 20.93sample/s]

Epoch 10/10, Training Loss: 0.8234464301484509, Validation Loss: 0.7969953853868496  
Accuracy: 0.5299435028248588, Precision: 0.5302574850375569, Recall: 0.5299435028248588, F1-score: 0.5263613131897712

Тренировка завершена!

Test: 100% | ██████████ |  
72/72 [00:03<00:00, 18.46sample/s]

```
Test Accuracy: 0.5328874024526199
Precision: 0.5348234339188197, Recall: 0.5328874024526199, F1-score: 0.5290090560993
571
Accuracy of cats : 62 %
Accuracy of dogs : 44 %
```

```
Class_name: cats
```

```
Train_count: 900
```

```
Test_count: 300
```

```
Valid_count: 300
```

```
Shutil images: 100%|██████████| 150
0/1500 [00:00<00:00, 1836.05image/s]
```

```
Class_name: dogs
```

```
Train_count: 900
```

```
Test_count: 300
```

```
Valid_count: 300
```

```
Shutil images: 100%|██████████| 150
0/1500 [00:00<00:00, 1846.48image/s]
```

---

```
-----
```

Выбранная модель: resnext101\_64x4d

Пользовательское название модели: resnext101\_64x4d\_Exp4

Выбранный оптимизатор: SGD

---

```
Epoch 1/10 (Train): 100%|██████████| 1
17/117 [00:23<00:00, 4.93sample/s]
```

```
Epoch 1/10 (Eval): 100%|██████████| 1
71/71 [00:05<00:00, 12.59sample/s]
```

```
Epoch 1/10, Training Loss: 1.7145057356749764, Validation Loss: 1.8847678538390809
Accuracy: 0.5067796610169492, Precision: 0.6888000442486388, Recall: 0.5067796610169492, F1-score: 0.3455819145464917
```

```
Epoch 2/10 (Train): 100%|██████████| 1
17/117 [00:23<00:00, 5.01sample/s]
```

```
Epoch 2/10 (Eval): 100%|██████████| 1
71/71 [00:05<00:00, 13.08sample/s]
```

```
Epoch 2/10, Training Loss: 1.586101114014553, Validation Loss: 1.074746532502484
Accuracy: 0.5124293785310734, Precision: 0.5943758737481855, Recall: 0.5124293785310734, F1-score: 0.3696708734566224
```

```
Epoch 3/10 (Train): 100%|██████████| 1
17/117 [00:22<00:00, 5.20sample/s]
```

```
Epoch 3/10 (Eval): 100%|██████████| 1
71/71 [00:05<00:00, 13.22sample/s]
```

```
Epoch 3/10, Training Loss: 1.4735248016526716, Validation Loss: 0.8512464057927751
Accuracy: 0.5440677966101695, Precision: 0.5451313898473563, Recall: 0.5440677966101695, F1-score: 0.5425244685882732
```

```
Epoch 4/10 (Train): 100%|██████████| 1
17/117 [00:22<00:00, 5.17sample/s]
```

```
Epoch 4/10 (Eval): 100%|██████████| 1
71/71 [00:05<00:00, 13.22sample/s]
```

Epoch 4/10, Training Loss: 1.3612281440095269, Validation Loss: 1.817794771854487  
Accuracy: 0.5005649717514125, Precision: 0.7509907034427065, Recall: 0.5005649717514125, F1-score: 0.33829483631065366

Epoch 5/10 (Train): 100% | 17/117 [00:22<00:00, 5.19sample/s]

Epoch 5/10 (Eval): 100% | 71/71 [00:05<00:00, 12.90sample/s]

Epoch 5/10, Training Loss: 1.2559050224961443, Validation Loss: 1.228116177148738  
Accuracy: 0.5090395480225989, Precision: 0.5549458404693005, Recall: 0.5090395480225989, F1-score: 0.36705013474334547

Epoch 6/10 (Train): 100% | 17/117 [00:23<00:00, 4.98sample/s]

Epoch 6/10 (Eval): 100% | 71/71 [00:05<00:00, 12.19sample/s]

Epoch 00006: reducing learning rate of group 0 to 1.0000e-04.

Epoch 6/10, Training Loss: 1.2657416748257024, Validation Loss: 1.67531337322783  
Accuracy: 0.5033898305084745, Precision: 0.25340132145935074, Recall: 0.5033898305084745, F1-score: 0.3371066057745591

Epoch 7/10 (Train): 100% | 17/117 [00:24<00:00, 4.86sample/s]

Epoch 7/10 (Eval): 100% | 71/71 [00:05<00:00, 12.40sample/s]

Epoch 7/10, Training Loss: 0.8468604551103526, Validation Loss: 0.7684765303202268  
Accuracy: 0.5977401129943503, Precision: 0.602522934060562, Recall: 0.5977401129943503, F1-score: 0.5938220426439978

Epoch 8/10 (Train): 100% | 17/117 [00:23<00:00, 4.89sample/s]

Epoch 8/10 (Eval): 100% | 71/71 [00:05<00:00, 12.74sample/s]

Epoch 8/10, Training Loss: 0.8045643973301502, Validation Loss: 0.7721142060844238  
Accuracy: 0.5734463276836158, Precision: 0.6088495793550934, Recall: 0.5734463276836158, F1-score: 0.5382752013684782

Epoch 9/10 (Train): 100% | 17/117 [00:23<00:00, 5.04sample/s]

Epoch 9/10 (Eval): 100% | 71/71 [00:05<00:00, 12.73sample/s]

Epoch 9/10, Training Loss: 0.7847005013859052, Validation Loss: 0.7622149694437361  
Accuracy: 0.6028248587570622, Precision: 0.602818854502619, Recall: 0.6028248587570622, F1-score: 0.6027369727470566

Epoch 10/10 (Train): 100% | 17/117 [00:23<00:00, 5.02sample/s]

Epoch 10/10 (Eval): 100% | 71/71 [00:05<00:00, 12.46sample/s]

Epoch 10/10, Training Loss: 0.7989398122977688, Validation Loss: 0.776101466794472  
Accuracy: 0.5875706214689266, Precision: 0.5937060036077486, Recall: 0.5875706214689266, F1-score: 0.5818047923435885

Тренировка завершена!

Test: 100% | 72/72 [00:05<00:00, 12.46sample/s]

```
Test Accuracy: 0.5953177257525084
Precision: 0.5988403758236504, Recall: 0.5953177257525084, F1-score: 0.5906803213053
384
Accuracy of cats : 48 %
Accuracy of dogs : 70 %
```

```
Class_name: cats
Train_count: 900
Test_count: 300
Valid_count: 300
```

```
Shutil images: 100%|██████████| 150
0/1500 [00:00<00:00, 1824.17image/s]
```

```
Class_name: dogs
Train_count: 900
Test_count: 300
Valid_count: 300
```

```
Shutil images: 100%|██████████| 150
0/1500 [00:00<00:00, 1799.70image/s]
```

---

```
Выбранная модель: resnext50_32x4d
```

```
Пользовательское название модели: resnext50_32x4d_Exp4
```

```
Выбранный оптимизатор: SGD
```

---

```
Epoch 1/10 (Train): 100%|██████████| 1
17/117 [00:12<00:00, 9.25sample/s]
Epoch 1/10 (Eval): 100%|██████████| 1
71/71 [00:03<00:00, 18.56sample/s]
```

```
Epoch 1/10, Training Loss: 1.7063524339646816, Validation Loss: 3.094204216321409
Accuracy: 0.4966101694915254, Precision: 0.2466216604424016, Recall: 0.4966101694915
254, F1-score: 0.329573679866403
```

```
Epoch 2/10 (Train): 100%|██████████| 1
17/117 [00:12<00:00, 9.40sample/s]
Epoch 2/10 (Eval): 100%|██████████| 1
71/71 [00:03<00:00, 18.70sample/s]
```

```
Epoch 2/10, Training Loss: 1.7641655980846178, Validation Loss: 1.4309316310757971
Accuracy: 0.5022598870056497, Precision: 0.25311852902829973, Recall: 0.502259887005
6497, F1-score: 0.3366029028371823
```

```
Epoch 3/10 (Train): 100%|██████████| 1
17/117 [00:12<00:00, 9.41sample/s]
Epoch 3/10 (Eval): 100%|██████████| 1
71/71 [00:03<00:00, 18.73sample/s]
```

```
Epoch 3/10, Training Loss: 1.850623840600191, Validation Loss: 0.9533617912375995
Accuracy: 0.5271186440677966, Precision: 0.5588398874341223, Recall: 0.5271186440677
966, F1-score: 0.4458415209032742
```

```
Epoch 4/10 (Train): 100%|██████████| 1
17/117 [00:12<00:00, 9.55sample/s]
Epoch 4/10 (Eval): 100%|██████████| 1
71/71 [00:03<00:00, 19.13sample/s]
```

Epoch 4/10, Training Loss: 1.5932679645528198, Validation Loss: 1.7008168102678773  
Accuracy: 0.5028248587570622, Precision: 0.751553752613677, Recall: 0.50282485875706  
22, F1-score: 0.3432257453863008

Epoch 5/10 (Train): 100% | ██████████ | 1  
17/117 [00:12<00:00, 9.34sample/s]  
Epoch 5/10 (Eval): 100% | ██████████ |  
71/71 [00:03<00:00, 18.88sample/s]

Epoch 5/10, Training Loss: 1.6558377619186764, Validation Loss: 1.9382335140559255  
Accuracy: 0.5033898305084745, Precision: 0.25340132145935074, Recall: 0.503389830508  
4745, F1-score: 0.3371066057745591

Epoch 6/10 (Train): 100% | ██████████ | 1  
17/117 [00:12<00:00, 9.39sample/s]  
Epoch 6/10 (Eval): 100% | ██████████ |  
71/71 [00:03<00:00, 18.95sample/s]

Epoch 00006: reducing learning rate of group 0 to 1.0000e-04.

Epoch 6/10, Training Loss: 1.4936050277936124, Validation Loss: 1.0122528029868831  
Accuracy: 0.5220338983050847, Precision: 0.6381131974994896, Recall: 0.5220338983050  
847, F1-score: 0.3998019308102138

Epoch 7/10 (Train): 100% | ██████████ | 1  
17/117 [00:12<00:00, 9.39sample/s]  
Epoch 7/10 (Eval): 100% | ██████████ |  
71/71 [00:03<00:00, 18.57sample/s]

Epoch 7/10, Training Loss: 0.837050848337295, Validation Loss: 0.7988089855107884  
Accuracy: 0.5384180790960452, Precision: 0.5399863431965495, Recall: 0.5384180790960  
452, F1-score: 0.5312411355853844

Epoch 8/10 (Train): 100% | ██████████ | 1  
17/117 [00:12<00:00, 9.44sample/s]  
Epoch 8/10 (Eval): 100% | ██████████ |  
71/71 [00:03<00:00, 19.03sample/s]

Epoch 8/10, Training Loss: 0.8334204930814674, Validation Loss: 0.7822534761859872  
Accuracy: 0.5418079096045197, Precision: 0.5423428749902452, Recall: 0.5418079096045  
197, F1-score: 0.5388011657372273

Epoch 9/10 (Train): 100% | ██████████ | 1  
17/117 [00:12<00:00, 9.46sample/s]  
Epoch 9/10 (Eval): 100% | ██████████ |  
71/71 [00:03<00:00, 19.63sample/s]

Epoch 9/10, Training Loss: 0.8154264855172391, Validation Loss: 0.7798142101468339  
Accuracy: 0.5491525423728814, Precision: 0.5528414066062634, Recall: 0.5491525423728  
814, F1-score: 0.5430930467766315

Epoch 10/10 (Train): 100% | ██████████ | 1  
17/117 [00:11<00:00, 9.90sample/s]  
Epoch 10/10 (Eval): 100% | ██████████ |  
71/71 [00:03<00:00, 19.65sample/s]

Epoch 10/10, Training Loss: 0.8160373926816369, Validation Loss: 0.7711442155016344  
Accuracy: 0.5514124293785311, Precision: 0.5538721081434791, Recall: 0.5514124293785  
311, F1-score: 0.547724100654542

Тренировка завершена!

Test: 100% | ██████████ |  
72/72 [00:04<00:00, 17.40sample/s]

```
Test Accuracy: 0.5518394648829431
Precision: 0.5534162125768128, Recall: 0.5518394648829431, F1-score: 0.5465942524871
753
Accuracy of cats : 44 %
Accuracy of dogs : 65 %
```

```
Class_name: cats
Train_count: 900
Test_count: 300
Valid_count: 300
```

```
Shutil images: 100%|██████████| 150
0/1500 [00:00<00:00, 1630.30image/s]
```

```
Class_name: dogs
Train_count: 900
Test_count: 300
Valid_count: 300
```

```
Shutil images: 100%|██████████| 150
0/1500 [00:00<00:00, 1789.72image/s]
```

---

```
-----  
Выбранная модель: shufflenet_v2_x0_5  
Пользовательское название модели: shufflenet_v2_x0_5_Exp4  
Выбранный оптимизатор: AdamW
```

---

```
Epoch 1/10 (Train): 100%|██████████| 1
17/117 [00:11<00:00, 9.80sample/s]
Epoch 1/10 (Eval): 100%|██████████| 1
71/71 [00:03<00:00, 22.24sample/s]
```

```
Epoch 1/10, Training Loss: 0.8798563556568193, Validation Loss: 0.8046090734207024
Accuracy: 0.5175141242937853, Precision: 0.5275420624573167, Recall: 0.5175141242937853, F1-score: 0.47929582464727033
```

```
Epoch 2/10 (Train): 100%|██████████| 1
17/117 [00:11<00:00, 9.84sample/s]
Epoch 2/10 (Eval): 100%|██████████| 1
71/71 [00:03<00:00, 22.23sample/s]
```

```
Epoch 2/10, Training Loss: 0.8295864394219302, Validation Loss: 0.7986434095323423
Accuracy: 0.503954802259887, Precision: 0.5155211381063013, Recall: 0.503954802259887, F1-score: 0.42066749615507015
```

```
Epoch 3/10 (Train): 100%|██████████| 1
17/117 [00:12<00:00, 9.74sample/s]
Epoch 3/10 (Eval): 100%|██████████| 1
71/71 [00:03<00:00, 22.46sample/s]
```

```
Epoch 3/10, Training Loss: 0.8276348548486185, Validation Loss: 0.7841898305604686
Accuracy: 0.5327683615819209, Precision: 0.5551175463174308, Recall: 0.5327683615819209, F1-score: 0.47354743324479376
```

```
Epoch 4/10 (Train): 100%|██████████| 1
17/117 [00:11<00:00, 9.79sample/s]
Epoch 4/10 (Eval): 100%|██████████| 1
71/71 [00:03<00:00, 22.36sample/s]
```

Epoch 4/10, Training Loss: 0.7952973454108052, Validation Loss: 0.8364447596046211  
Accuracy: 0.5022598870056497, Precision: 0.5659487775884695, Recall: 0.5022598870056497, F1-score: 0.35505403230254257

Epoch 5/10 (Train): 100% | ██████████ | 1  
17/117 [00:12<00:00, 9.64sample/s]  
Epoch 5/10 (Eval): 100% | ██████████ |  
71/71 [00:03<00:00, 22.29sample/s]

Epoch 5/10, Training Loss: 0.7949064361305577, Validation Loss: 0.8072621405629788  
Accuracy: 0.5175141242937853, Precision: 0.5561228615898274, Recall: 0.5175141242937853, F1-score: 0.40735809304578724

Epoch 6/10 (Train): 100% | ██████████ | 1  
17/117 [00:11<00:00, 9.84sample/s]  
Epoch 6/10 (Eval): 100% | ██████████ |  
71/71 [00:03<00:00, 22.17sample/s]

Epoch 00006: reducing learning rate of group 0 to 1.0000e-04.

Epoch 6/10, Training Loss: 0.8035659045083136, Validation Loss: 0.8096396959265747  
Accuracy: 0.5056497175141242, Precision: 0.5474502226625719, Recall: 0.5056497175141242, F1-score: 0.35081398115847146

Epoch 7/10 (Train): 100% | ██████████ | 1  
17/117 [00:11<00:00, 9.88sample/s]  
Epoch 7/10 (Eval): 100% | ██████████ |  
71/71 [00:03<00:00, 22.37sample/s]

Epoch 7/10, Training Loss: 0.7740506842946908, Validation Loss: 0.7659757192862235  
Accuracy: 0.5717514124293785, Precision: 0.5925172389510918, Recall: 0.5717514124293785, F1-score: 0.5437718115197872

Epoch 8/10 (Train): 100% | ██████████ | 1  
17/117 [00:11<00:00, 9.98sample/s]  
Epoch 8/10 (Eval): 100% | ██████████ |  
71/71 [00:03<00:00, 22.65sample/s]

Epoch 8/10, Training Loss: 0.7643293226476072, Validation Loss: 0.7623683751302924  
Accuracy: 0.5774011299435028, Precision: 0.5994117149450167, Recall: 0.5774011299435028, F1-score: 0.5503253570693357

Epoch 9/10 (Train): 100% | ██████████ | 1  
17/117 [00:11<00:00, 9.83sample/s]  
Epoch 9/10 (Eval): 100% | ██████████ |  
71/71 [00:03<00:00, 22.28sample/s]

Epoch 9/10, Training Loss: 0.7645611164707121, Validation Loss: 0.7666192979125653  
Accuracy: 0.5525423728813559, Precision: 0.611314313360221, Recall: 0.5525423728813559, F1-score: 0.48058225113071207

Epoch 10/10 (Train): 100% | ██████████ | 1  
17/117 [00:11<00:00, 9.88sample/s]  
Epoch 10/10 (Eval): 100% | ██████████ |  
71/71 [00:03<00:00, 22.15sample/s]

Epoch 10/10, Training Loss: 0.7621389040397895, Validation Loss: 0.7604087562547566  
Accuracy: 0.5672316384180791, Precision: 0.5952515164098695, Recall: 0.5672316384180791, F1-score: 0.5299558381132576

Тренировка завершена!

Test: 100% | ██████████ |  
72/72 [00:03<00:00, 20.57sample/s]

```
Test Accuracy: 0.5691192865105908
Precision: 0.601290160169998, Recall: 0.5691192865105908, F1-score: 0.53507734671196
84
Accuracy of cats : 84 %
Accuracy of dogs : 29 %
```

```
Class_name: cats
Train_count: 900
Test_count: 300
Valid_count: 300
```

```
Shutil images: 100%|██████████| 150
0/1500 [00:00<00:00, 1866.33image/s]
```

```
Class_name: dogs
Train_count: 900
Test_count: 300
Valid_count: 300
```

```
Shutil images: 100%|██████████| 150
0/1500 [00:00<00:00, 1767.53image/s]
```

---

```
-----  
Выбранная модель: shufflenet_v2_x1_0
Пользовательское название модели: shufflenet_v2_x1_0_Exp4
Выбранный оптимизатор: AdamW
```

---

```
Epoch 1/10 (Train): 100%|██████████| 1
17/117 [00:12<00:00, 9.44sample/s]
Epoch 1/10 (Eval): 100%|██████████| 1
71/71 [00:03<00:00, 22.35sample/s]
```

```
Epoch 1/10, Training Loss: 0.8744797609782202, Validation Loss: 0.7870392204172867
Accuracy: 0.5361581920903955, Precision: 0.558149000480417, Recall: 0.5361581920903955, F1-score: 0.4929922260849105
```

```
Epoch 2/10 (Train): 100%|██████████| 1
17/117 [00:12<00:00, 9.47sample/s]
Epoch 2/10 (Eval): 100%|██████████| 1
71/71 [00:03<00:00, 22.36sample/s]
```

```
Epoch 2/10, Training Loss: 0.8073709336064138, Validation Loss: 0.8929360099768234
Accuracy: 0.4966101694915254, Precision: 0.2466216604424016, Recall: 0.4966101694915254, F1-score: 0.329573679866403
```

```
Epoch 3/10 (Train): 100%|██████████| 1
17/117 [00:12<00:00, 9.68sample/s]
Epoch 3/10 (Eval): 100%|██████████| 1
71/71 [00:03<00:00, 22.05sample/s]
```

```
Epoch 3/10, Training Loss: 0.7731274188259353, Validation Loss: 0.719623709886761
Accuracy: 0.6209039548022599, Precision: 0.6614334123627037, Recall: 0.6209039548022599, F1-score: 0.5940345959623851
```

```
Epoch 4/10 (Train): 100%|██████████| 1
17/117 [00:12<00:00, 9.51sample/s]
Epoch 4/10 (Eval): 100%|██████████| 1
71/71 [00:03<00:00, 22.00sample/s]
```

Epoch 4/10, Training Loss: 0.7743458571174195, Validation Loss: 0.694437306816295  
Accuracy: 0.655367231638418, Precision: 0.6709823392413657, Recall: 0.655367231638418, F1-score: 0.6480152754347692

Epoch 5/10 (Train): 100% | ██████████ | 1  
17/117 [00:12<00:00, 9.57sample/s]

Epoch 5/10 (Eval): 100% | ██████████ |  
71/71 [00:03<00:00, 22.54sample/s]

Epoch 5/10, Training Loss: 0.7501170042036657, Validation Loss: 0.6708339766762351  
Accuracy: 0.6971751412429379, Precision: 0.7232827387485485, Recall: 0.6971751412429379, F1-score: 0.6874556628395425

Epoch 6/10 (Train): 100% | ██████████ | 1  
17/117 [00:12<00:00, 9.52sample/s]

Epoch 6/10 (Eval): 100% | ██████████ |  
71/71 [00:03<00:00, 22.26sample/s]

Epoch 6/10, Training Loss: 0.7093549552664028, Validation Loss: 0.6975528456817912  
Accuracy: 0.6508474576271186, Precision: 0.7402577513906459, Recall: 0.6508474576271186, F1-score: 0.6137491104343461

Epoch 7/10 (Train): 100% | ██████████ | 1  
17/117 [00:12<00:00, 9.60sample/s]

Epoch 7/10 (Eval): 100% | ██████████ |  
71/71 [00:03<00:00, 22.28sample/s]

Epoch 7/10, Training Loss: 0.7191058882831955, Validation Loss: 0.6048701786052035  
Accuracy: 0.7548022598870057, Precision: 0.7555245445592466, Recall: 0.7548022598870057, F1-score: 0.7545593390206645

Epoch 8/10 (Train): 100% | ██████████ | 1  
17/117 [00:12<00:00, 9.62sample/s]

Epoch 8/10 (Eval): 100% | ██████████ |  
71/71 [00:03<00:00, 22.58sample/s]

Epoch 8/10, Training Loss: 0.6872100156206559, Validation Loss: 0.6614431796942727  
Accuracy: 0.668361581920904, Precision: 0.7477216637580771, Recall: 0.668361581920904, F1-score: 0.6384037680084839

Epoch 9/10 (Train): 100% | ██████████ | 1  
17/117 [00:12<00:00, 9.69sample/s]

Epoch 9/10 (Eval): 100% | ██████████ |  
71/71 [00:03<00:00, 21.44sample/s]

Epoch 9/10, Training Loss: 0.6703623983245586, Validation Loss: 0.5331520438194275  
Accuracy: 0.7768361581920904, Precision: 0.7771401578927676, Recall: 0.7768361581920904, F1-score: 0.7768073070166789

Epoch 10/10 (Train): 100% | ██████████ | 1  
17/117 [00:12<00:00, 9.44sample/s]

Epoch 10/10 (Eval): 100% | ██████████ |  
71/71 [00:03<00:00, 22.45sample/s]

Epoch 10/10, Training Loss: 0.6588949664068843, Validation Loss: 0.536648794924472  
Accuracy: 0.7768361581920904, Precision: 0.7790778687346307, Recall: 0.7768361581920904, F1-score: 0.7764791588143191

Тренировка завершена!

Test: 100% | ██████████ |  
72/72 [00:03<00:00, 20.30sample/s]

```
Test Accuracy: 0.7876254180602007
Precision: 0.7898424736215983, Recall: 0.7876254180602007, F1-score: 0.7871162210742
033
Accuracy of cats : 74 %
Accuracy of dogs : 83 %
```

```
Class_name: cats
```

```
Train_count: 900
```

```
Test_count: 300
```

```
Valid_count: 300
```

```
Shutil images: 100%|██████████| 150
0/1500 [00:00<00:00, 1844.97image/s]
```

```
Class_name: dogs
```

```
Train_count: 900
```

```
Test_count: 300
```

```
Valid_count: 300
```

```
Shutil images: 100%|██████████| 150
0/1500 [00:00<00:00, 1838.95image/s]
```

---

```
Выбранная модель: shufflenet_v2_x1_5
```

```
Пользовательское название модели: shufflenet_v2_x1_5_Exp4
```

```
Выбранный оптимизатор: AdamW
```

---

```
Epoch 1/10 (Train): 100%|██████████| 1
17/117 [00:12<00:00, 9.67sample/s]
```

```
Epoch 1/10 (Eval): 100%|██████████| 1
71/71 [00:03<00:00, 22.20sample/s]
```

```
Epoch 1/10, Training Loss: 0.8679106707561498, Validation Loss: 0.7342423461588089
Accuracy: 0.6107344632768361, Precision: 0.614128559536744, Recall: 0.61073446327683
61, F1-score: 0.6071552191946615
```

```
Epoch 2/10 (Train): 100%|██████████| 1
17/117 [00:12<00:00, 9.66sample/s]
```

```
Epoch 2/10 (Eval): 100%|██████████| 1
71/71 [00:03<00:00, 22.33sample/s]
```

```
Epoch 2/10, Training Loss: 0.8036400488666511, Validation Loss: 0.8053891443263339
Accuracy: 0.5429378531073447, Precision: 0.7054112859833199, Recall: 0.5429378531073
447, F1-score: 0.4269910120607491
```

```
Epoch 3/10 (Train): 100%|██████████| 1
17/117 [00:11<00:00, 9.79sample/s]
```

```
Epoch 3/10 (Eval): 100%|██████████| 1
71/71 [00:03<00:00, 22.86sample/s]
```

```
Epoch 3/10, Training Loss: 0.7351206456904055, Validation Loss: 0.6894433384729644
Accuracy: 0.6457627118644068, Precision: 0.7093509622861317, Recall: 0.6457627118644
068, F1-score: 0.6153841156735398
```

```
Epoch 4/10 (Train): 100%|██████████| 1
17/117 [00:12<00:00, 9.56sample/s]
```

```
Epoch 4/10 (Eval): 100%|██████████| 1
71/71 [00:03<00:00, 22.57sample/s]
```

Epoch 4/10, Training Loss: 0.7346277935117627, Validation Loss: 0.6246251899138683  
Accuracy: 0.7440677966101695, Precision: 0.7575267091683427, Recall: 0.7440677966101  
695, F1-score: 0.7403782822271445

Epoch 5/10 (Train): 100% | ██████████ | 1  
17/117 [00:12<00:00, 9.69sample/s]  
Epoch 5/10 (Eval): 100% | ██████████ |  
71/71 [00:03<00:00, 22.57sample/s]

Epoch 5/10, Training Loss: 0.7063875589430373, Validation Loss: 0.5484271967141642  
Accuracy: 0.7768361581920904, Precision: 0.7844502674420908, Recall: 0.7768361581920  
904, F1-score: 0.7751577000302062

Epoch 6/10 (Train): 100% | ██████████ | 1  
17/117 [00:12<00:00, 9.65sample/s]  
Epoch 6/10 (Eval): 100% | ██████████ |  
71/71 [00:03<00:00, 22.51sample/s]

Epoch 6/10, Training Loss: 0.6895999541382335, Validation Loss: 0.5402564026710004  
Accuracy: 0.768361581920904, Precision: 0.7788608124283627, Recall: 0.7683615819209  
4, F1-score: 0.7659419530650164

Epoch 7/10 (Train): 100% | ██████████ | 1  
17/117 [00:12<00:00, 9.63sample/s]  
Epoch 7/10 (Eval): 100% | ██████████ |  
71/71 [00:03<00:00, 22.46sample/s]

Epoch 7/10, Training Loss: 0.666271406935044, Validation Loss: 0.4990739072699331  
Accuracy: 0.7807909604519774, Precision: 0.8052096257410691, Recall: 0.7807909604519  
774, F1-score: 0.7760300829580035

Epoch 8/10 (Train): 100% | ██████████ | 1  
17/117 [00:12<00:00, 9.59sample/s]  
Epoch 8/10 (Eval): 100% | ██████████ |  
71/71 [00:03<00:00, 22.70sample/s]

Epoch 8/10, Training Loss: 0.6335763653167067, Validation Loss: 0.48626244093401955  
Accuracy: 0.8254237288135593, Precision: 0.8257821848680619, Recall: 0.8254237288135  
593, F1-score: 0.8253494054730928

Epoch 9/10 (Train): 100% | ██████████ | 1  
17/117 [00:12<00:00, 9.67sample/s]  
Epoch 9/10 (Eval): 100% | ██████████ |  
71/71 [00:03<00:00, 22.54sample/s]

Epoch 9/10, Training Loss: 0.6315112407277756, Validation Loss: 0.49418370114207943  
Accuracy: 0.8259887005649718, Precision: 0.829586998324758, Recall: 0.8259887005649  
18, F1-score: 0.8254332760902138

Epoch 10/10 (Train): 100% | ██████████ | 1  
17/117 [00:12<00:00, 9.63sample/s]  
Epoch 10/10 (Eval): 100% | ██████████ |  
71/71 [00:03<00:00, 22.71sample/s]

Epoch 10/10, Training Loss: 0.626233770300258, Validation Loss: 0.4547517139696132  
Accuracy: 0.8254237288135593, Precision: 0.8290192862135244, Recall: 0.8254237288135  
593, F1-score: 0.8250223326863964

Тренировка завершена!

Test: 100% | ██████████ |  
72/72 [00:03<00:00, 19.34sample/s]

```
Test Accuracy: 0.8115942028985508
Precision: 0.8161777478731428, Recall: 0.8115942028985508, F1-score: 0.8107918903997
328
Accuracy of cats : 74 %
Accuracy of dogs : 87 %
```

```
Class_name: cats
```

```
Train_count: 900
```

```
Test_count: 300
```

```
Valid_count: 300
```

```
Shutil images: 100%|██████████| 150
0/1500 [00:00<00:00, 1864.18image/s]
```

```
Class_name: dogs
```

```
Train_count: 900
```

```
Test_count: 300
```

```
Valid_count: 300
```

```
Shutil images: 100%|██████████| 150
0/1500 [00:00<00:00, 1836.86image/s]
```

---

```
-----
```

Выбранная модель: shufflenet\_v2\_x2\_0

Пользовательское название модели: shufflenet\_v2\_x2\_0\_Exp4

Выбранный оптимизатор: AdamW

---

```
Epoch 1/10 (Train): 100%|██████████| 1
17/117 [00:11<00:00, 9.77sample/s]
Epoch 1/10 (Eval): 100%|██████████| 1
71/71 [00:03<00:00, 21.02sample/s]
```

```
Epoch 1/10, Training Loss: 0.9367204422285657, Validation Loss: 0.895284643617727
Accuracy: 0.5033898305084745, Precision: 0.25340132145935074, Recall: 0.503389830508
4745, F1-score: 0.3371066057745591
```

```
Epoch 2/10 (Train): 100%|██████████| 1
17/117 [00:11<00:00, 9.81sample/s]
Epoch 2/10 (Eval): 100%|██████████| 1
71/71 [00:03<00:00, 20.96sample/s]
```

```
Epoch 2/10, Training Loss: 0.7933927486823633, Validation Loss: 0.7357123697039771
Accuracy: 0.5807909604519774, Precision: 0.6817467177095092, Recall: 0.5807909604519
774, F1-score: 0.5156364194884389
```

```
Epoch 3/10 (Train): 100%|██████████| 1
17/117 [00:12<00:00, 9.66sample/s]
Epoch 3/10 (Eval): 100%|██████████| 1
71/71 [00:03<00:00, 20.80sample/s]
```

```
Epoch 3/10, Training Loss: 0.7469908302577086, Validation Loss: 0.6397056478565022
Accuracy: 0.6926553672316385, Precision: 0.7471598838439748, Recall: 0.6926553672316
385, F1-score: 0.6739165190994181
```

```
Epoch 4/10 (Train): 100%|██████████| 1
17/117 [00:12<00:00, 9.73sample/s]
Epoch 4/10 (Eval): 100%|██████████| 1
71/71 [00:03<00:00, 20.83sample/s]
```

Epoch 4/10, Training Loss: 0.7475247155974547, Validation Loss: 0.6584035048292856  
Accuracy: 0.6740112994350282, Precision: 0.7569859040492791, Recall: 0.6740112994350  
282, F1-score: 0.6464129079328743

Epoch 5/10 (Train): 100% | ██████████ | 1  
17/117 [00:12<00:00, 9.64sample/s]

Epoch 5/10 (Eval): 100% | ██████████ |  
71/71 [00:03<00:00, 21.03sample/s]

Epoch 5/10, Training Loss: 0.6877702880980137, Validation Loss: 0.5442703127187524  
Accuracy: 0.7954802259887006, Precision: 0.79555335594363, Recall: 0.795480225988700  
6, F1-score: 0.7954802259887006

Epoch 6/10 (Train): 100% | ██████████ | 1  
17/117 [00:11<00:00, 9.75sample/s]

Epoch 6/10 (Eval): 100% | ██████████ |  
71/71 [00:03<00:00, 20.60sample/s]

Epoch 6/10, Training Loss: 0.6976885704184493, Validation Loss: 0.4995453259197332  
Accuracy: 0.8016949152542373, Precision: 0.8042482625076799, Recall: 0.8016949152542  
373, F1-score: 0.8011943716687161

Epoch 7/10 (Train): 100% | ██████████ | 1  
17/117 [00:11<00:00, 9.87sample/s]

Epoch 7/10 (Eval): 100% | ██████████ |  
71/71 [00:03<00:00, 20.99sample/s]

Epoch 7/10, Training Loss: 0.6425565138428566, Validation Loss: 0.7066611798722192  
Accuracy: 0.5135593220338983, Precision: 0.6762331345765104, Recall: 0.5135593220338  
983, F1-score: 0.3630491594189096

Epoch 8/10 (Train): 100% | ██████████ | 1  
17/117 [00:12<00:00, 9.73sample/s]

Epoch 8/10 (Eval): 100% | ██████████ |  
71/71 [00:03<00:00, 21.16sample/s]

Epoch 8/10, Training Loss: 0.6499787149178483, Validation Loss: 0.5209185318589884  
Accuracy: 0.8248587570621468, Precision: 0.8267628015424625, Recall: 0.8248587570621  
468, F1-score: 0.8246593300395709

Epoch 9/10 (Train): 100% | ██████████ | 1  
17/117 [00:11<00:00, 9.90sample/s]

Epoch 9/10 (Eval): 100% | ██████████ |  
71/71 [00:03<00:00, 20.59sample/s]

Epoch 9/10, Training Loss: 0.6267249649767193, Validation Loss: 0.47656170670258796  
Accuracy: 0.811864406779661, Precision: 0.8121937787630487, Recall: 0.81186440677966  
1, F1-score: 0.8118400841431748

Epoch 10/10 (Train): 100% | ██████████ | 1  
17/117 [00:11<00:00, 9.87sample/s]

Epoch 10/10 (Eval): 100% | ██████████ |  
71/71 [00:03<00:00, 21.01sample/s]

Epoch 10/10, Training Loss: 0.581599005399051, Validation Loss: 0.4428606579280169  
Accuracy: 0.811864406779661, Precision: 0.8184580259222334, Recall: 0.81186440677966  
1, F1-score: 0.8107651528704864

Тренировка завершена!

Test: 100% | ██████████ |  
72/72 [00:03<00:00, 18.74sample/s]

```
Test Accuracy: 0.8160535117056856
Precision: 0.8236944854626967, Recall: 0.8160535117056856, F1-score: 0.8151008066664
732
Accuracy of cats : 89 %
Accuracy of dogs : 74 %
```

```
Class_name: cats
```

```
Train_count: 900
```

```
Test_count: 300
```

```
Valid_count: 300
```

```
Shutil images: 100%|██████████| 150
0/1500 [00:00<00:00, 1831.26image/s]
```

```
Class_name: dogs
```

```
Train_count: 900
```

```
Test_count: 300
```

```
Valid_count: 300
```

```
Shutil images: 100%|██████████| 150
0/1500 [00:00<00:00, 1845.47image/s]
```

---

```
-----
```

Выбранная модель: swin\_b

Пользовательское название модели: swin\_b\_Exp4

Выбранный оптимизатор: SGD

```
-----
```

```
Epoch 1/10 (Train): 100%|██████████| 1
17/117 [00:19<00:00, 5.91sample/s]
Epoch 1/10 (Eval): 100%|██████████| 1
71/71 [00:04<00:00, 14.61sample/s]
```

```
Epoch 1/10, Training Loss: 0.8549785360111776, Validation Loss: 0.782521522061973
Accuracy: 0.5824858757062147, Precision: 0.6600418567111512, Recall: 0.5824858757062
147, F1-score: 0.5224166205641275
```

```
Epoch 2/10 (Train): 100%|██████████| 1
17/117 [00:19<00:00, 5.92sample/s]
Epoch 2/10 (Eval): 100%|██████████| 1
71/71 [00:04<00:00, 14.59sample/s]
```

```
Epoch 2/10, Training Loss: 0.8082533421134034, Validation Loss: 0.7551265682204295
Accuracy: 0.5932203389830508, Precision: 0.6038322785426692, Recall: 0.5932203389830
508, F1-score: 0.583835463888568
```

```
Epoch 3/10 (Train): 100%|██████████| 1
17/117 [00:19<00:00, 5.91sample/s]
Epoch 3/10 (Eval): 100%|██████████| 1
71/71 [00:04<00:00, 14.54sample/s]
```

```
Epoch 3/10, Training Loss: 0.7964376339853586, Validation Loss: 0.7736161795713133
Accuracy: 0.5864406779661017, Precision: 0.6604358652115183, Recall: 0.5864406779661
017, F1-score: 0.5301401960366806
```

```
Epoch 4/10 (Train): 100%|██████████| 1
17/117 [00:19<00:00, 5.92sample/s]
Epoch 4/10 (Eval): 100%|██████████| 1
71/71 [00:04<00:00, 14.35sample/s]
```

```
Epoch 4/10, Training Loss: 0.7867470595671593, Validation Loss: 0.690907458801054
Accuracy: 0.6491525423728813, Precision: 0.6493378505037882, Recall: 0.6491525423728
813, F1-score: 0.6489296129999299

Epoch 5/10 (Train): 100%|██████████| 1
17/117 [00:19<00:00, 5.90sample/s]
Epoch 5/10 (Eval): 100%|██████████| 1
71/71 [00:04<00:00, 14.46sample/s]
Epoch 5/10, Training Loss: 0.7777567741763028, Validation Loss: 0.6966715596489987
Accuracy: 0.6468926553672316, Precision: 0.6972474830755169, Recall: 0.6468926553672
316, F1-score: 0.6216287798234041

Epoch 6/10 (Train): 100%|██████████| 1
17/117 [00:19<00:00, 5.89sample/s]
Epoch 6/10 (Eval): 100%|██████████| 1
71/71 [00:04<00:00, 14.27sample/s]
Epoch 6/10, Training Loss: 0.7673135216183823, Validation Loss: 0.8113909461824907
Accuracy: 0.5971751412429378, Precision: 0.6772776947202496, Recall: 0.5971751412429
378, F1-score: 0.5437505184176307

Epoch 7/10 (Train): 100%|██████████| 1
17/117 [00:20<00:00, 5.83sample/s]
Epoch 7/10 (Eval): 100%|██████████| 1
71/71 [00:04<00:00, 14.39sample/s]
Epoch 00007: reducing learning rate of group 0 to 1.0000e-04.

Epoch 7/10, Training Loss: 0.7555497270115766, Validation Loss: 0.7763934301286094
Accuracy: 0.5903954802259888, Precision: 0.7256387819273484, Recall: 0.5903954802259
888, F1-score: 0.5160100135090111

Epoch 8/10 (Train): 100%|██████████| 1
17/117 [00:20<00:00, 5.79sample/s]
Epoch 8/10 (Eval): 100%|██████████| 1
71/71 [00:04<00:00, 14.22sample/s]
Epoch 8/10, Training Loss: 0.7431424000518138, Validation Loss: 0.6558449594146114
Accuracy: 0.6853107344632768, Precision: 0.6988116024926995, Recall: 0.6853107344632
768, F1-score: 0.679364514881241

Epoch 9/10 (Train): 100%|██████████| 1
17/117 [00:20<00:00, 5.73sample/s]
Epoch 9/10 (Eval): 100%|██████████| 1
71/71 [00:04<00:00, 14.55sample/s]
Epoch 9/10, Training Loss: 0.7427181506438808, Validation Loss: 0.6514052683855854
Accuracy: 0.6847457627118644, Precision: 0.6907617026615679, Recall: 0.6847457627118
644, F1-score: 0.6818816108066778

Epoch 10/10 (Train): 100%|██████████| 1
17/117 [00:20<00:00, 5.74sample/s]
Epoch 10/10 (Eval): 100%|██████████| 1
71/71 [00:04<00:00, 14.47sample/s]
Epoch 10/10, Training Loss: 0.7286466849103539, Validation Loss: 0.6545255169861735
Accuracy: 0.6909604519774011, Precision: 0.7117313201309469, Recall: 0.6909604519774
011, F1-score: 0.6826100327992041
Тренировка завершена!

Test: 100%|██████████| 1
72/72 [00:05<00:00, 13.89sample/s]
```

```
Test Accuracy: 0.669453734671126
Precision: 0.6918009111815024, Recall: 0.669453734671126, F1-score: 0.66034841255174
35
Accuracy of cats : 83 %
Accuracy of dogs : 50 %
```

```
Class_name: cats
```

```
Train_count: 900
```

```
Test_count: 300
```

```
Valid_count: 300
```

```
Shutil images: 100%|██████████| 150
0/1500 [00:00<00:00, 1819.36image/s]
```

```
Class_name: dogs
```

```
Train_count: 900
```

```
Test_count: 300
```

```
Valid_count: 300
```

```
Shutil images: 100%|██████████| 150
0/1500 [00:00<00:00, 1726.62image/s]
```

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```
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```

Выбранная модель: swin\_s

Пользовательское название модели: swin\_s\_Exp4

Выбранный оптимизатор: SGD

```
-----
```

```
Epoch 1/10 (Train): 100%|██████████| 1
17/117 [00:16<00:00, 6.92sample/s]
Epoch 1/10 (Eval): 100%|██████████| 1
71/71 [00:04<00:00, 16.52sample/s]
```

```
Epoch 1/10, Training Loss: 0.83592540250403, Validation Loss: 0.7444549169244066
Accuracy: 0.592090395480226, Precision: 0.5930999437293949, Recall: 0.592090395480226, F1-score: 0.5913810500616671
```

```
Epoch 2/10 (Train): 100%|██████████| 1
17/117 [00:16<00:00, 7.01sample/s]
Epoch 2/10 (Eval): 100%|██████████| 1
71/71 [00:04<00:00, 16.22sample/s]
```

```
Epoch 2/10, Training Loss: 0.7848322878070201, Validation Loss: 0.8570769721336957
Accuracy: 0.5683615819209039, Precision: 0.7088503474600882, Recall: 0.5683615819209039, F1-score: 0.47841757210093305
```

```
Epoch 3/10 (Train): 100%|██████████| 1
17/117 [00:16<00:00, 7.02sample/s]
Epoch 3/10 (Eval): 100%|██████████| 1
71/71 [00:04<00:00, 16.31sample/s]
```

```
Epoch 3/10, Training Loss: 0.7743312722816297, Validation Loss: 0.7227791534305292
Accuracy: 0.6293785310734463, Precision: 0.6381951861311045, Recall: 0.6293785310734463, F1-score: 0.6240955922018384
```

```
Epoch 4/10 (Train): 100%|██████████| 1
17/117 [00:16<00:00, 6.93sample/s]
Epoch 4/10 (Eval): 100%|██████████| 1
71/71 [00:04<00:00, 16.20sample/s]
```

Epoch 4/10, Training Loss: 0.7579574875426341, Validation Loss: 0.6772016512472078  
Accuracy: 0.6734463276836158, Precision: 0.6811743580908198, Recall: 0.6734463276836158, F1-score: 0.6694764553698986

Epoch 5/10 (Train): 100% | ██████████ | 1  
17/117 [00:16<00:00, 6.95sample/s]

Epoch 5/10 (Eval): 100% | ██████████ |  
71/71 [00:04<00:00, 16.37sample/s]

Epoch 5/10, Training Loss: 0.7470319336044045, Validation Loss: 0.7094733224245114  
Accuracy: 0.6451977401129944, Precision: 0.6455047642190772, Recall: 0.6451977401129944, F1-score: 0.6451130157052543

Epoch 6/10 (Train): 100% | ██████████ | 1  
17/117 [00:16<00:00, 6.98sample/s]

Epoch 6/10 (Eval): 100% | ██████████ |  
71/71 [00:04<00:00, 16.40sample/s]

Epoch 6/10, Training Loss: 0.7438988625962413, Validation Loss: 0.6799953943592006  
Accuracy: 0.6610169491525424, Precision: 0.6674718499864281, Recall: 0.6610169491525424, F1-score: 0.658159016101587

Epoch 7/10 (Train): 100% | ██████████ | 1  
17/117 [00:16<00:00, 6.93sample/s]

Epoch 7/10 (Eval): 100% | ██████████ |  
71/71 [00:04<00:00, 16.61sample/s]

Epoch 7/10, Training Loss: 0.7444955704962252, Validation Loss: 0.6624645593307786  
Accuracy: 0.6661016949152543, Precision: 0.6689385811935783, Recall: 0.6661016949152543, F1-score: 0.6649714509735684

Epoch 8/10 (Train): 100% | ██████████ | 1  
17/117 [00:16<00:00, 6.94sample/s]

Epoch 8/10 (Eval): 100% | ██████████ |  
71/71 [00:04<00:00, 16.51sample/s]

Epoch 8/10, Training Loss: 0.7407451834557724, Validation Loss: 0.663845984359919  
Accuracy: 0.6830508474576271, Precision: 0.6933607386794839, Recall: 0.6830508474576271, F1-score: 0.6783039978004773

Epoch 9/10 (Train): 100% | ██████████ | 1  
17/117 [00:16<00:00, 6.91sample/s]

Epoch 9/10 (Eval): 100% | ██████████ |  
71/71 [00:04<00:00, 16.35sample/s]

Epoch 9/10, Training Loss: 0.7209133158365777, Validation Loss: 0.7148823356729442  
Accuracy: 0.6661016949152543, Precision: 0.688720200159756, Recall: 0.6661016949152543, F1-score: 0.6550268063157537

Epoch 10/10 (Train): 100% | ██████████ | 1  
17/117 [00:16<00:00, 6.89sample/s]

Epoch 10/10 (Eval): 100% | ██████████ |  
71/71 [00:04<00:00, 16.64sample/s]

Epoch 10/10, Training Loss: 0.7170237947850296, Validation Loss: 0.6519770198791041  
Accuracy: 0.6757062146892655, Precision: 0.6768879510361746, Recall: 0.6757062146892655, F1-score: 0.6749776745033715

Тренировка завершена!

Test: 100% | ██████████ |  
72/72 [00:04<00:00, 15.75sample/s]

```
Test Accuracy: 0.6767001114827201
Precision: 0.6787496399297642, Recall: 0.6767001114827201, F1-score: 0.6760117811777
834
Accuracy of cats : 72 %
Accuracy of dogs : 62 %
```

```
Class_name: cats
```

```
Train_count: 900
```

```
Test_count: 300
```

```
Valid_count: 300
```

```
Shutil images: 100%|██████████| 150
0/1500 [00:00<00:00, 1789.26image/s]
```

```
Class_name: dogs
```

```
Train_count: 900
```

```
Test_count: 300
```

```
Valid_count: 300
```

```
Shutil images: 100%|██████████| 150
0/1500 [00:00<00:00, 1823.39image/s]
```

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```
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```

Выбранная модель: swin\_t

Пользовательское название модели: swin\_t\_Exp4

Выбранный оптимизатор: SGD

```
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```

```
Epoch 1/10 (Train): 100%|██████████| 1
17/117 [00:11<00:00, 9.97sample/s]
Epoch 1/10 (Eval): 100%|██████████| 1
71/71 [00:03<00:00, 19.98sample/s]
```

```
Epoch 1/10, Training Loss: 0.8173178136757255, Validation Loss: 0.8096638406063877
Accuracy: 0.5887005649717514, Precision: 0.5889644374300091, Recall: 0.5887005649717
514, F1-score: 0.588060820448676
```

```
Epoch 2/10 (Train): 100%|██████████| 1
17/117 [00:11<00:00, 10.01sample/s]
Epoch 2/10 (Eval): 100%|██████████| 1
71/71 [00:03<00:00, 19.78sample/s]
```

```
Epoch 2/10, Training Loss: 0.7913960755443311, Validation Loss: 0.7407996844773912
Accuracy: 0.5994350282485875, Precision: 0.658282879498545, Recall: 0.5994350282485
75, F1-score: 0.5563558428835823
```

```
Epoch 3/10 (Train): 100%|██████████| 1
17/117 [00:11<00:00, 9.91sample/s]
Epoch 3/10 (Eval): 100%|██████████| 1
71/71 [00:03<00:00, 20.09sample/s]
```

```
Epoch 3/10, Training Loss: 0.7737127372751177, Validation Loss: 0.7175582212916876
Accuracy: 0.6333333333333333, Precision: 0.6333986230425855, Recall: 0.6333333333333
33, F1-score: 0.6333318118458335
```

```
Epoch 4/10 (Train): 100%|██████████| 1
17/117 [00:11<00:00, 10.05sample/s]
Epoch 4/10 (Eval): 100%|██████████| 1
71/71 [00:03<00:00, 20.04sample/s]
```

Epoch 4/10, Training Loss: 0.7560694558192312, Validation Loss: 0.7321561739101248  
Accuracy: 0.6067796610169491, Precision: 0.6114970344719354, Recall: 0.6067796610169491, F1-score: 0.6032970800853321

Epoch 5/10 (Train): 100% | ██████████ | 1  
17/117 [00:11<00:00, 9.97sample/s]  
Epoch 5/10 (Eval): 100% | ██████████ |  
71/71 [00:03<00:00, 19.89sample/s]

Epoch 5/10, Training Loss: 0.7489920825562794, Validation Loss: 0.6996692172383184  
Accuracy: 0.6485875706214689, Precision: 0.6741018821774489, Recall: 0.6485875706214689, F1-score: 0.6342718607162833

Epoch 6/10 (Train): 100% | ██████████ | 1  
17/117 [00:11<00:00, 9.88sample/s]  
Epoch 6/10 (Eval): 100% | ██████████ |  
71/71 [00:03<00:00, 19.90sample/s]

Epoch 6/10, Training Loss: 0.7452323914105309, Validation Loss: 0.6756039076605759  
Accuracy: 0.6717514124293785, Precision: 0.6763116353335616, Recall: 0.6717514124293785, F1-score: 0.6699481525109733

Epoch 7/10 (Train): 100% | ██████████ | 1  
17/117 [00:11<00:00, 9.95sample/s]  
Epoch 7/10 (Eval): 100% | ██████████ |  
71/71 [00:03<00:00, 19.79sample/s]

Epoch 7/10, Training Loss: 0.7445178619388687, Validation Loss: 0.6811653309117602  
Accuracy: 0.6689265536723163, Precision: 0.684494913700845, Recall: 0.6689265536723163, F1-score: 0.6611540001947547

Epoch 8/10 (Train): 100% | ██████████ | 1  
17/117 [00:11<00:00, 10.06sample/s]  
Epoch 8/10 (Eval): 100% | ██████████ |  
71/71 [00:03<00:00, 20.04sample/s]

Epoch 8/10, Training Loss: 0.7394805835116963, Validation Loss: 0.6579377834743025  
Accuracy: 0.6796610169491526, Precision: 0.6975997081226653, Recall: 0.6796610169491526, F1-score: 0.6716134314199079

Epoch 9/10 (Train): 100% | ██████████ | 1  
17/117 [00:11<00:00, 10.06sample/s]  
Epoch 9/10 (Eval): 100% | ██████████ |  
71/71 [00:03<00:00, 20.08sample/s]

Epoch 9/10, Training Loss: 0.7219478443234322, Validation Loss: 0.6666608244012304  
Accuracy: 0.6847457627118644, Precision: 0.6848632433511708, Recall: 0.6847457627118644, F1-score: 0.6846330029169669

Epoch 10/10 (Train): 100% | ██████████ | 1  
17/117 [00:11<00:00, 9.99sample/s]  
Epoch 10/10 (Eval): 100% | ██████████ |  
71/71 [00:03<00:00, 18.72sample/s]

Epoch 10/10, Training Loss: 0.7225544135443065, Validation Loss: 0.640619318532405  
Accuracy: 0.7022598870056497, Precision: 0.7044017139292887, Recall: 0.7022598870056497, F1-score: 0.7012902968219218

Тренировка завершена!

Test: 100% | ██████████ |  
72/72 [00:04<00:00, 17.54sample/s]

```
Test Accuracy: 0.7062430323299889
Precision: 0.7094915488279531, Recall: 0.7062430323299889, F1-score: 0.7053323253001
19
Accuracy of cats : 76 %
Accuracy of dogs : 64 %
```

```
Class_name: cats
```

```
Train_count: 900
```

```
Test_count: 300
```

```
Valid_count: 300
```

```
Shutil images: 100%|██████████| 150
0/1500 [00:00<00:00, 1769.50image/s]
```

```
Class_name: dogs
```

```
Train_count: 900
```

```
Test_count: 300
```

```
Valid_count: 300
```

```
Shutil images: 100%|██████████| 150
0/1500 [00:00<00:00, 1784.16image/s]
```

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```
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```

Выбранная модель: vgg11

Пользовательское название модели: vgg11\_Exp4

Выбранный оптимизатор: SGD

```
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```

```
Epoch 1/10 (Train): 100%|██████████| 1
17/117 [00:08<00:00, 13.02sample/s]
Epoch 1/10 (Eval): 100%|██████████| 1
71/71 [00:02<00:00, 24.25sample/s]
```

```
Epoch 1/10, Training Loss: 0.7934243116091179, Validation Loss: 0.7782373615240646
Accuracy: 0.4966101694915254, Precision: 0.2466216604424016, Recall: 0.4966101694915
254, F1-score: 0.329573679866403
```

```
Epoch 2/10 (Train): 100%|██████████| 1
17/117 [00:08<00:00, 13.36sample/s]
Epoch 2/10 (Eval): 100%|██████████| 1
71/71 [00:02<00:00, 24.11sample/s]
```

```
Epoch 2/10, Training Loss: 0.7853906725758637, Validation Loss: 0.7783112551196146
Accuracy: 0.4966101694915254, Precision: 0.2466216604424016, Recall: 0.4966101694915
254, F1-score: 0.329573679866403
```

```
Epoch 3/10 (Train): 100%|██████████| 1
17/117 [00:08<00:00, 13.27sample/s]
Epoch 3/10 (Eval): 100%|██████████| 1
71/71 [00:02<00:00, 24.14sample/s]
```

```
Epoch 3/10, Training Loss: 0.7887932471496917, Validation Loss: 0.7686798168440997
Accuracy: 0.5644067796610169, Precision: 0.6573962841184959, Recall: 0.5644067796610
169, F1-score: 0.48584060831112913
```

```
Epoch 4/10 (Train): 100%|██████████| 1
17/117 [00:08<00:00, 13.29sample/s]
Epoch 4/10 (Eval): 100%|██████████| 1
71/71 [00:02<00:00, 24.23sample/s]
```

Epoch 4/10, Training Loss: 0.7776884731975134, Validation Loss: 0.7643542894199069  
Accuracy: 0.6322033898305085, Precision: 0.6351552192225718, Recall: 0.6322033898305085, F1-score: 0.6305942246343561

Epoch 5/10 (Train): 100% | ██████████ | 1  
17/117 [00:08<00:00, 13.20sample/s]  
Epoch 5/10 (Eval): 100% | ██████████ |  
71/71 [00:02<00:00, 24.22sample/s]

Epoch 5/10, Training Loss: 0.7752140077153978, Validation Loss: 0.7622601036298073  
Accuracy: 0.6129943502824858, Precision: 0.665941190494679, Recall: 0.6129943502824858, F1-score: 0.5777343760373782

Epoch 6/10 (Train): 100% | ██████████ | 1  
17/117 [00:08<00:00, 13.26sample/s]  
Epoch 6/10 (Eval): 100% | ██████████ |  
71/71 [00:02<00:00, 24.14sample/s]

Epoch 6/10, Training Loss: 0.769599674804477, Validation Loss: 0.7598955437625196  
Accuracy: 0.5627118644067797, Precision: 0.6549999977001882, Recall: 0.562711864406797, F1-score: 0.4892900250843102

Epoch 7/10 (Train): 100% | ██████████ | 1  
17/117 [00:08<00:00, 13.32sample/s]  
Epoch 7/10 (Eval): 100% | ██████████ |  
71/71 [00:02<00:00, 24.17sample/s]

Epoch 7/10, Training Loss: 0.7607537779888116, Validation Loss: 0.7563079477703504  
Accuracy: 0.5706214689265536, Precision: 0.6504284177129497, Recall: 0.5706214689265536, F1-score: 0.5020555436578351

Epoch 8/10 (Train): 100% | ██████████ | 1  
17/117 [00:08<00:00, 13.34sample/s]  
Epoch 8/10 (Eval): 100% | ██████████ |  
71/71 [00:02<00:00, 24.29sample/s]

Epoch 8/10, Training Loss: 0.7685854447427231, Validation Loss: 0.7479801543351621  
Accuracy: 0.6361581920903955, Precision: 0.6590830100463742, Recall: 0.6361581920903955, F1-score: 0.6215120176194581

Epoch 9/10 (Train): 100% | ██████████ | 1  
17/117 [00:08<00:00, 13.30sample/s]  
Epoch 9/10 (Eval): 100% | ██████████ |  
71/71 [00:02<00:00, 24.20sample/s]

Epoch 9/10, Training Loss: 0.7586814316271755, Validation Loss: 0.7405599412945031  
Accuracy: 0.6519774011299435, Precision: 0.6553515464038134, Recall: 0.6519774011299435, F1-score: 0.6504284311236022

Epoch 10/10 (Train): 100% | ██████████ | 1  
17/117 [00:08<00:00, 13.31sample/s]  
Epoch 10/10 (Eval): 100% | ██████████ |  
71/71 [00:02<00:00, 24.15sample/s]

Epoch 10/10, Training Loss: 0.7572802619790279, Validation Loss: 0.7360730895214835  
Accuracy: 0.6305084745762712, Precision: 0.6453657462834809, Recall: 0.6305084745762712, F1-score: 0.621719431956689

Тренировка завершена!

Test: 100% | ██████████ |  
72/72 [00:03<00:00, 18.57sample/s]

```
Test Accuracy: 0.6393534002229655
Precision: 0.6520468850324418, Recall: 0.6393534002229655, F1-score: 0.6307346877180
173
Accuracy of cats : 48 %
Accuracy of dogs : 78 %
```

```
Class_name: cats
```

```
Train_count: 900
```

```
Test_count: 300
```

```
Valid_count: 300
```

```
Shutil images: 100%|██████████| 150
0/1500 [00:00<00:00, 1830.65image/s]
```

```
Class_name: dogs
```

```
Train_count: 900
```

```
Test_count: 300
```

```
Valid_count: 300
```

```
Shutil images: 100%|██████████| 150
0/1500 [00:00<00:00, 1835.41image/s]
```

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```
Выбранная модель: vgg11_bn
```

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Пользовательское название модели: vgg11_bn_Exp4
```

```
Выбранный оптимизатор: SGD
```

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```
Epoch 1/10 (Train): 100%|██████████| 1
17/117 [00:08<00:00, 13.21sample/s]
Epoch 1/10 (Eval): 100%|██████████| 1
71/71 [00:02<00:00, 24.11sample/s]
```

```
Epoch 1/10, Training Loss: 1.2233522955565685, Validation Loss: 0.722762042182987
Accuracy: 0.6463276836158192, Precision: 0.6543139953191932, Recall: 0.6463276836158
192, F1-score: 0.6410807894035513
```

```
Epoch 2/10 (Train): 100%|██████████| 1
17/117 [00:08<00:00, 13.00sample/s]
Epoch 2/10 (Eval): 100%|██████████| 1
71/71 [00:02<00:00, 23.99sample/s]
```

```
Epoch 2/10, Training Loss: 0.9068352926198222, Validation Loss: 0.7088901302908773
Accuracy: 0.6655367231638418, Precision: 0.6684304409866063, Recall: 0.6655367231638
418, F1-score: 0.6637813767917344
```

```
Epoch 3/10 (Train): 100%|██████████| 1
17/117 [00:08<00:00, 13.14sample/s]
Epoch 3/10 (Eval): 100%|██████████| 1
71/71 [00:03<00:00, 23.39sample/s]
```

```
Epoch 3/10, Training Loss: 0.8436384633888195, Validation Loss: 0.7218557528856784
Accuracy: 0.5966101694915255, Precision: 0.6830876810462108, Recall: 0.5966101694915
255, F1-score: 0.540459854935057
```

```
Epoch 4/10 (Train): 100%|██████████| 1
17/117 [00:08<00:00, 13.02sample/s]
Epoch 4/10 (Eval): 100%|██████████| 1
71/71 [00:02<00:00, 24.08sample/s]
```

Epoch 4/10, Training Loss: 0.8070510168897526, Validation Loss: 0.7080660293162879  
Accuracy: 0.6271186440677966, Precision: 0.6845850943962386, Recall: 0.6271186440677966, F1-score: 0.5941527547682767

Epoch 5/10 (Train): 100% | 17/117 [00:08<00:00, 13.12sample/s]

Epoch 5/10 (Eval): 100% | 71/71 [00:02<00:00, 24.20sample/s]

Epoch 5/10, Training Loss: 0.7851254615455233, Validation Loss: 0.6967755494649801  
Accuracy: 0.6491525423728813, Precision: 0.6955354829482447, Recall: 0.6491525423728813, F1-score: 0.625893620676178

Epoch 6/10 (Train): 100% | 17/117 [00:08<00:00, 13.16sample/s]

Epoch 6/10 (Eval): 100% | 71/71 [00:02<00:00, 24.04sample/s]

Epoch 6/10, Training Loss: 0.7559687947066701, Validation Loss: 0.7279465661547279  
Accuracy: 0.584180790960452, Precision: 0.7026459761548763, Recall: 0.584180790960452, F1-score: 0.5153283878177362

Epoch 7/10 (Train): 100% | 17/117 [00:08<00:00, 13.13sample/s]

Epoch 7/10 (Eval): 100% | 71/71 [00:02<00:00, 24.06sample/s]

Epoch 7/10, Training Loss: 0.7407664539186493, Validation Loss: 0.6574428626204615  
Accuracy: 0.6943502824858757, Precision: 0.701314020998392, Recall: 0.6943502824858757, F1-score: 0.6913344437737923

Epoch 8/10 (Train): 100% | 17/117 [00:08<00:00, 13.05sample/s]

Epoch 8/10 (Eval): 100% | 71/71 [00:02<00:00, 24.02sample/s]

Epoch 8/10, Training Loss: 0.7518890508954209, Validation Loss: 0.6599488451992724  
Accuracy: 0.6711864406779661, Precision: 0.6888454859003775, Recall: 0.6711864406779661, F1-score: 0.6639461606732359

Epoch 9/10 (Train): 100% | 17/117 [00:09<00:00, 12.86sample/s]

Epoch 9/10 (Eval): 100% | 71/71 [00:02<00:00, 24.01sample/s]

Epoch 9/10, Training Loss: 0.7335796097907569, Validation Loss: 0.6538597342826552  
Accuracy: 0.6870056497175141, Precision: 0.6988888050214715, Recall: 0.6870056497175141, F1-score: 0.6827148674575065

Epoch 10/10 (Train): 100% | 17/117 [00:09<00:00, 12.98sample/s]

Epoch 10/10 (Eval): 100% | 71/71 [00:02<00:00, 23.97sample/s]

Epoch 10/10, Training Loss: 0.7273785639107432, Validation Loss: 0.6204764594634374  
Accuracy: 0.7209039548022599, Precision: 0.727751955788148, Recall: 0.7209039548022599, F1-score: 0.7190486062776033

Тренировка завершена!

Test: 100% | 72/72 [00:03<00:00, 18.54sample/s]

```
Test Accuracy: 0.7263099219620959
Precision: 0.7320429251803026, Recall: 0.7263099219620959, F1-score: 0.7243338435226
953
Accuracy of cats : 64 %
Accuracy of dogs : 80 %
```

```
Class_name: cats
```

```
Train_count: 900
```

```
Test_count: 300
```

```
Valid_count: 300
```

```
Shutil images: 100%|██████████| 150
0/1500 [00:00<00:00, 1810.57image/s]
```

```
Class_name: dogs
```

```
Train_count: 900
```

```
Test_count: 300
```

```
Valid_count: 300
```

```
Shutil images: 100%|██████████| 150
0/1500 [00:00<00:00, 1711.78image/s]
```

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```

Выбранная модель: vgg13

Пользовательское название модели: vgg13\_Exp4

Выбранный оптимизатор: SGD

```
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```

```
Epoch 1/10 (Train): 100%|██████████| 1
17/117 [00:09<00:00, 11.98sample/s]
Epoch 1/10 (Eval): 100%|██████████| 1
71/71 [00:03<00:00, 23.23sample/s]
```

```
Epoch 1/10, Training Loss: 0.7857165750450594, Validation Loss: 0.7763260639993484
Accuracy: 0.5480225988700564, Precision: 0.6035471080922203, Recall: 0.5480225988700
564, F1-score: 0.4737831215741746
```

```
Epoch 2/10 (Train): 100%|██████████| 1
17/117 [00:09<00:00, 12.06sample/s]
Epoch 2/10 (Eval): 100%|██████████| 1
71/71 [00:03<00:00, 22.60sample/s]
```

```
Epoch 2/10, Training Loss: 0.7768192598679198, Validation Loss: 0.7735879547515158
Accuracy: 0.6214689265536724, Precision: 0.621803503234972, Recall: 0.62146892655367
24, F1-score: 0.6213495261849359
```

```
Epoch 3/10 (Train): 100%|██████████| 1
17/117 [00:09<00:00, 12.07sample/s]
Epoch 3/10 (Eval): 100%|██████████| 1
71/71 [00:03<00:00, 22.86sample/s]
```

```
Epoch 3/10, Training Loss: 0.7749178070087315, Validation Loss: 0.7719457679885929
Accuracy: 0.53954802259887, Precision: 0.6444713338960176, Recall: 0.53954802259887,
F1-score: 0.4414005789450195
```

```
Epoch 4/10 (Train): 100%|██████████| 1
17/117 [00:09<00:00, 12.07sample/s]
Epoch 4/10 (Eval): 100%|██████████| 1
71/71 [00:03<00:00, 22.78sample/s]
```

Epoch 4/10, Training Loss: 0.7755727920939123, Validation Loss: 0.7699413890555754  
Accuracy: 0.5389830508474577, Precision: 0.6434832331499682, Recall: 0.5389830508474  
577, F1-score: 0.44039431721526195

Epoch 5/10 (Train): 100% | ██████████ | 1  
17/117 [00:09<00:00, 12.12sample/s]  
Epoch 5/10 (Eval): 100% | ██████████ |  
71/71 [00:03<00:00, 22.82sample/s]

Epoch 5/10, Training Loss: 0.7750765755210861, Validation Loss: 0.7666753816739315  
Accuracy: 0.6033898305084746, Precision: 0.6535341920136114, Recall: 0.6033898305084  
746, F1-score: 0.5699594200158693

Epoch 6/10 (Train): 100% | ██████████ | 1  
17/117 [00:09<00:00, 12.06sample/s]  
Epoch 6/10 (Eval): 100% | ██████████ |  
71/71 [00:03<00:00, 22.89sample/s]

Epoch 6/10, Training Loss: 0.7703961871559282, Validation Loss: 0.7629578066410991  
Accuracy: 0.6542372881355932, Precision: 0.6542834692845909, Recall: 0.6542372881355  
932, F1-score: 0.6542394954397097

Epoch 7/10 (Train): 100% | ██████████ | 1  
17/117 [00:09<00:00, 11.97sample/s]  
Epoch 7/10 (Eval): 100% | ██████████ |  
71/71 [00:03<00:00, 22.85sample/s]

Epoch 7/10, Training Loss: 0.7664875402239759, Validation Loss: 0.7593981271746468  
Accuracy: 0.632768361581921, Precision: 0.6687651690830364, Recall: 0.63276836158192  
1, F1-score: 0.610824228621707

Epoch 8/10 (Train): 100% | ██████████ | 1  
17/117 [00:09<00:00, 12.05sample/s]  
Epoch 8/10 (Eval): 100% | ██████████ |  
71/71 [00:03<00:00, 23.00sample/s]

Epoch 8/10, Training Loss: 0.7648578918985179, Validation Loss: 0.754182146430689  
Accuracy: 0.6344632768361582, Precision: 0.639396166029849, Recall: 0.63446327683615  
82, F1-score: 0.6317172495984268

Epoch 9/10 (Train): 100% | ██████████ | 1  
17/117 [00:09<00:00, 12.06sample/s]  
Epoch 9/10 (Eval): 100% | ██████████ |  
71/71 [00:03<00:00, 22.80sample/s]

Epoch 9/10, Training Loss: 0.7616430290804242, Validation Loss: 0.7488561494875763  
Accuracy: 0.63954802259887, Precision: 0.6445806230805492, Recall: 0.63954802259887,  
F1-score: 0.6368757803535412

Epoch 10/10 (Train): 100% | ██████████ | 1  
17/117 [00:09<00:00, 12.13sample/s]  
Epoch 10/10 (Eval): 100% | ██████████ |  
71/71 [00:03<00:00, 22.81sample/s]

Epoch 10/10, Training Loss: 0.7609832341169314, Validation Loss: 0.744934152243501  
Accuracy: 0.6468926553672316, Precision: 0.6722750143446248, Recall: 0.6468926553672  
316, F1-score: 0.6324221262846763

Тренировка завершена!

Test: 100% | ██████████ |  
72/72 [00:03<00:00, 18.02sample/s]

```
Test Accuracy: 0.6410256410256411
Precision: 0.6707206294563627, Recall: 0.6410256410256411, F1-score: 0.6259068264654
857
Accuracy of cats : 84 %
Accuracy of dogs : 44 %
```

```
Class_name: cats
```

```
Train_count: 900
```

```
Test_count: 300
```

```
Valid_count: 300
```

```
Shutil images: 100%|██████████| 150
0/1500 [00:00<00:00, 1837.17image/s]
```

```
Class_name: dogs
```

```
Train_count: 900
```

```
Test_count: 300
```

```
Valid_count: 300
```

```
Shutil images: 100%|██████████| 150
0/1500 [00:00<00:00, 1822.45image/s]
```

---

```
Выбранная модель: vgg13_bn
```

```
Пользовательское название модели: vgg13_bn_Exp4
```

```
Выбранный оптимизатор: SGD
```

---

```
Epoch 1/10 (Train): 100%|██████████| 1
17/117 [00:10<00:00, 11.41sample/s]
Epoch 1/10 (Eval): 100%|██████████| 1
71/71 [00:03<00:00, 22.58sample/s]
```

```
Epoch 1/10, Training Loss: 1.2311751492387877, Validation Loss: 0.7371154614424301
Accuracy: 0.5903954802259888, Precision: 0.6489457067394309, Recall: 0.5903954802259
888, F1-score: 0.5479432315817885
```

```
Epoch 2/10 (Train): 100%|██████████| 1
17/117 [00:09<00:00, 11.70sample/s]
Epoch 2/10 (Eval): 100%|██████████| 1
71/71 [00:03<00:00, 22.53sample/s]
```

```
Epoch 2/10, Training Loss: 0.8611943035030953, Validation Loss: 0.789364497119424
Accuracy: 0.5401129943502825, Precision: 0.7107317129374108, Recall: 0.5401129943502
825, F1-score: 0.4200945178031796
```

```
Epoch 3/10 (Train): 100%|██████████| 1
17/117 [00:10<00:00, 11.65sample/s]
Epoch 3/10 (Eval): 100%|██████████| 1
71/71 [00:03<00:00, 22.61sample/s]
```

```
Epoch 3/10, Training Loss: 0.823258987328547, Validation Loss: 0.6873364126951681
Accuracy: 0.6706214689265537, Precision: 0.6725888912681178, Recall: 0.6706214689265
537, F1-score: 0.6698996102737402
```

```
Epoch 4/10 (Train): 100%|██████████| 1
17/117 [00:09<00:00, 11.75sample/s]
Epoch 4/10 (Eval): 100%|██████████| 1
71/71 [00:03<00:00, 22.59sample/s]
```

Epoch 4/10, Training Loss: 0.8134762811652596, Validation Loss: 0.6791253231339536  
Accuracy: 0.672316384180791, Precision: 0.6824937896435809, Recall: 0.67231638418079  
1, F1-score: 0.6681708536170615

Epoch 5/10 (Train): 100% | 1  
17/117 [00:09<00:00, 11.70sample/s]  
Epoch 5/10 (Eval): 100% |  
71/71 [00:03<00:00, 21.69sample/s]

Epoch 5/10, Training Loss: 0.7543838001465945, Validation Loss: 0.6813289599735185  
Accuracy: 0.6666666666666666, Precision: 0.7095761024182077, Recall: 0.6666666666666666  
666, F1-score: 0.6477395430299705

Epoch 6/10 (Train): 100% | 1  
17/117 [00:10<00:00, 11.55sample/s]  
Epoch 6/10 (Eval): 100% |  
71/71 [00:03<00:00, 22.55sample/s]

Epoch 6/10, Training Loss: 0.7628918786094645, Validation Loss: 0.6553404358147228  
Accuracy: 0.7096045197740113, Precision: 0.7154746084993873, Recall: 0.7096045197740  
113, F1-score: 0.7073330709333634

Epoch 7/10 (Train): 100% | 1  
17/117 [00:09<00:00, 11.73sample/s]  
Epoch 7/10 (Eval): 100% |  
71/71 [00:03<00:00, 22.50sample/s]

Epoch 7/10, Training Loss: 0.7499733648535485, Validation Loss: 0.6521461797130983  
Accuracy: 0.7, Precision: 0.7247422680412371, Recall: 0.7, F1-score: 0.6909357582868  
877

Epoch 8/10 (Train): 100% | 1  
17/117 [00:09<00:00, 11.71sample/s]  
Epoch 8/10 (Eval): 100% |  
71/71 [00:03<00:00, 22.64sample/s]

Epoch 8/10, Training Loss: 0.7392264938644549, Validation Loss: 0.6399612827489605  
Accuracy: 0.7084745762711865, Precision: 0.7276166044786107, Recall: 0.7084745762711  
865, F1-score: 0.7017347122258508

Epoch 9/10 (Train): 100% | 1  
17/117 [00:09<00:00, 11.75sample/s]  
Epoch 9/10 (Eval): 100% |  
71/71 [00:03<00:00, 22.20sample/s]

Epoch 9/10, Training Loss: 0.7231980945616245, Validation Loss: 0.6338138050783826  
Accuracy: 0.7214689265536723, Precision: 0.7260047191758058, Recall: 0.7214689265536  
723, F1-score: 0.7198415025980475

Epoch 10/10 (Train): 100% | 1  
17/117 [00:10<00:00, 11.65sample/s]  
Epoch 10/10 (Eval): 100% |  
71/71 [00:03<00:00, 22.61sample/s]

Epoch 10/10, Training Loss: 0.7328811294416436, Validation Loss: 0.6669030186988539  
Accuracy: 0.6689265536723163, Precision: 0.7327294041656482, Recall: 0.6689265536723  
163, F1-score: 0.6435355807460554

Тренировка завершена!

Test: 100% |  
72/72 [00:04<00:00, 17.13sample/s]

```
Test Accuracy: 0.6633221850613155
Precision: 0.7364427748059461, Recall: 0.6633221850613155, F1-score: 0.6363673224931
932
Accuracy of cats : 93 %
Accuracy of dogs : 39 %
```

```
Class_name: cats
```

```
Train_count: 900
```

```
Test_count: 300
```

```
Valid_count: 300
```

```
Shutil images: 100%|██████████| 150
0/1500 [00:00<00:00, 1848.06image/s]
```

```
Class_name: dogs
```

```
Train_count: 900
```

```
Test_count: 300
```

```
Valid_count: 300
```

```
Shutil images: 100%|██████████| 150
0/1500 [00:00<00:00, 1755.28image/s]
```

---

```
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```

Выбранная модель: vgg16

Пользовательское название модели: vgg16\_Exp4

Выбранный оптимизатор: SGD

```
-----
```

```
Epoch 1/10 (Train): 100%|██████████| 1
17/117 [00:10<00:00, 11.06sample/s]
Epoch 1/10 (Eval): 100%|██████████| 1
71/71 [00:03<00:00, 22.07sample/s]
```

```
Epoch 1/10, Training Loss: 0.7857730783486383, Validation Loss: 0.7776267508328971
Accuracy: 0.5576271186440678, Precision: 0.5611556755436723, Recall: 0.5576271186440
678, F1-score: 0.5492682498240787
```

```
Epoch 2/10 (Train): 100%|██████████| 1
17/117 [00:10<00:00, 11.31sample/s]
Epoch 2/10 (Eval): 100%|██████████| 1
71/71 [00:03<00:00, 22.21sample/s]
```

```
Epoch 2/10, Training Loss: 0.7849030023449656, Validation Loss: 0.7751738482949424
Accuracy: 0.5700564971751413, Precision: 0.6002753019364285, Recall: 0.5700564971751
413, F1-score: 0.5322099599575527
```

```
Epoch 3/10 (Train): 100%|██████████| 1
17/117 [00:10<00:00, 11.12sample/s]
Epoch 3/10 (Eval): 100%|██████████| 1
71/71 [00:03<00:00, 22.09sample/s]
```

```
Epoch 3/10, Training Loss: 0.7801590815155861, Validation Loss: 0.7740602971470288
Accuracy: 0.5796610169491525, Precision: 0.6119796447089957, Recall: 0.5796610169491
525, F1-score: 0.5492766098285145
```

```
Epoch 4/10 (Train): 100%|██████████| 1
17/117 [00:10<00:00, 11.15sample/s]
Epoch 4/10 (Eval): 100%|██████████| 1
71/71 [00:03<00:00, 21.96sample/s]
```

Epoch 4/10, Training Loss: 0.7751035396165435, Validation Loss: 0.7718803899436347  
Accuracy: 0.6186440677966102, Precision: 0.6208660266287385, Recall: 0.6186440677966102, F1-score: 0.6173022210159019

Epoch 5/10 (Train): 100% | ██████████ | 1  
17/117 [00:10<00:00, 11.16sample/s]

Epoch 5/10 (Eval): 100% | ██████████ |  
71/71 [00:03<00:00, 22.00sample/s]

Epoch 5/10, Training Loss: 0.7748242152153915, Validation Loss: 0.7697355994733713  
Accuracy: 0.6169491525423729, Precision: 0.6231621448141252, Recall: 0.6169491525423729, F1-score: 0.6112664140824406

Epoch 6/10 (Train): 100% | ██████████ | 1  
17/117 [00:10<00:00, 11.13sample/s]

Epoch 6/10 (Eval): 100% | ██████████ |  
71/71 [00:03<00:00, 22.06sample/s]

Epoch 6/10, Training Loss: 0.7720788954626296, Validation Loss: 0.7672098247008136  
Accuracy: 0.6214689265536724, Precision: 0.6245294824839, Recall: 0.6214689265536724, F1-score: 0.6185842305734937

Epoch 7/10 (Train): 100% | ██████████ | 1  
17/117 [00:10<00:00, 11.12sample/s]

Epoch 7/10 (Eval): 100% | ██████████ |  
71/71 [00:03<00:00, 21.97sample/s]

Epoch 7/10, Training Loss: 0.7729020213492526, Validation Loss: 0.7688451522150955  
Accuracy: 0.5146892655367231, Precision: 0.7115338691828296, Recall: 0.5146892655367231, F1-score: 0.36360917738132237

Epoch 8/10 (Train): 100% | ██████████ | 1  
17/117 [00:10<00:00, 11.24sample/s]

Epoch 8/10 (Eval): 100% | ██████████ |  
71/71 [00:03<00:00, 22.00sample/s]

Epoch 8/10, Training Loss: 0.7684339091457514, Validation Loss: 0.7607337712904828  
Accuracy: 0.6146892655367232, Precision: 0.6331798060015272, Recall: 0.6146892655367232, F1-score: 0.6020240529727992

Epoch 9/10 (Train): 100% | ██████████ | 1  
17/117 [00:10<00:00, 11.22sample/s]

Epoch 9/10 (Eval): 100% | ██████████ |  
71/71 [00:03<00:00, 22.09sample/s]

Epoch 9/10, Training Loss: 0.7643750626146998, Validation Loss: 0.7563188491904803  
Accuracy: 0.6028248587570622, Precision: 0.6350557243722111, Recall: 0.6028248587570622, F1-score: 0.5792913080948754

Epoch 10/10 (Train): 100% | ██████████ | 1  
17/117 [00:10<00:00, 11.15sample/s]

Epoch 10/10 (Eval): 100% | ██████████ |  
71/71 [00:03<00:00, 21.95sample/s]

Epoch 10/10, Training Loss: 0.7614515409884671, Validation Loss: 0.7497685332756258  
Accuracy: 0.6192090395480226, Precision: 0.6485749371021493, Recall: 0.6192090395480226, F1-score: 0.5980308260882905

Тренировка завершена!

Test: 100% | ██████████ |  
72/72 [00:04<00:00, 17.35sample/s]

```
Test Accuracy: 0.6192865105908584
Precision: 0.6520146378967546, Recall: 0.6192865105908584, F1-score: 0.5992022802960
045
Accuracy of cats : 84 %
Accuracy of dogs : 39 %
```

```
Class_name: cats
```

```
Train_count: 900
```

```
Test_count: 300
```

```
Valid_count: 300
```

```
Shutil images: 100%|██████████| 150
0/1500 [00:00<00:00, 1831.09image/s]
```

```
Class_name: dogs
```

```
Train_count: 900
```

```
Test_count: 300
```

```
Valid_count: 300
```

```
Shutil images: 100%|██████████| 150
0/1500 [00:00<00:00, 1820.03image/s]
```

---

```
-----
```

Выбранная модель: vgg16\_bn

Пользовательское название модели: vgg16\_bn\_Exp4

Выбранный оптимизатор: SGD

```
-----
```

```
Epoch 1/10 (Train): 100%|██████████| 1
17/117 [00:10<00:00, 10.68sample/s]
Epoch 1/10 (Eval): 100%|██████████| 1
71/71 [00:03<00:00, 21.68sample/s]
```

```
Epoch 1/10, Training Loss: 1.231776394404476, Validation Loss: 0.7858209996405294
Accuracy: 0.5101694915254237, Precision: 0.6027936879018118, Recall: 0.5101694915254
237, F1-score: 0.3604522070203658
```

```
Epoch 2/10 (Train): 100%|██████████| 1
17/117 [00:10<00:00, 10.81sample/s]
Epoch 2/10 (Eval): 100%|██████████| 1
71/71 [00:03<00:00, 21.73sample/s]
```

```
Epoch 2/10, Training Loss: 0.8963704398635971, Validation Loss: 0.7684767805250351
Accuracy: 0.53954802259887, Precision: 0.5879359905631093, Recall: 0.53954802259887,
F1-score: 0.46095456758127695
```

```
Epoch 3/10 (Train): 100%|██████████| 1
17/117 [00:10<00:00, 10.84sample/s]
Epoch 3/10 (Eval): 100%|██████████| 1
71/71 [00:03<00:00, 21.71sample/s]
```

```
Epoch 3/10, Training Loss: 0.8668884054857873, Validation Loss: 0.7707014652126927
Accuracy: 0.5299435028248588, Precision: 0.6939429486806687, Recall: 0.5299435028248
588, F1-score: 0.40017164982206316
```

```
Epoch 4/10 (Train): 100%|██████████| 1
17/117 [00:10<00:00, 10.87sample/s]
Epoch 4/10 (Eval): 100%|██████████| 1
71/71 [00:03<00:00, 21.59sample/s]
```

Epoch 4/10, Training Loss: 0.8244272410420215, Validation Loss: 0.7200975173947501  
Accuracy: 0.6435028248587571, Precision: 0.6446853466843618, Recall: 0.6435028248587571, F1-score: 0.6429955090673294

Epoch 5/10 (Train): 100% | ██████████ | 1  
17/117 [00:10<00:00, 10.84sample/s]

Epoch 5/10 (Eval): 100% | ██████████ |  
71/71 [00:03<00:00, 21.70sample/s]

Epoch 5/10, Training Loss: 0.7981479855699847, Validation Loss: 0.7186740495390811  
Accuracy: 0.6480225988700565, Precision: 0.6487414992676291, Recall: 0.6480225988700565, F1-score: 0.6473933639422654

Epoch 6/10 (Train): 100% | ██████████ | 1  
17/117 [00:10<00:00, 10.79sample/s]

Epoch 6/10 (Eval): 100% | ██████████ |  
71/71 [00:03<00:00, 21.72sample/s]

Epoch 6/10, Training Loss: 0.7925221057400629, Validation Loss: 0.7191740446171518  
Accuracy: 0.6361581920903955, Precision: 0.6624817848565601, Recall: 0.6361581920903955, F1-score: 0.6196999830385251

Epoch 7/10 (Train): 100% | ██████████ | 1  
17/117 [00:10<00:00, 10.87sample/s]

Epoch 7/10 (Eval): 100% | ██████████ |  
71/71 [00:03<00:00, 21.81sample/s]

Epoch 7/10, Training Loss: 0.7721511660127136, Validation Loss: 0.7484784252562765  
Accuracy: 0.5576271186440678, Precision: 0.6677318470194843, Recall: 0.5576271186440678, F1-score: 0.46755546646412227

Epoch 8/10 (Train): 100% | ██████████ | 1  
17/117 [00:10<00:00, 10.82sample/s]

Epoch 8/10 (Eval): 100% | ██████████ |  
71/71 [00:03<00:00, 20.85sample/s]

Epoch 8/10, Training Loss: 0.7766080000696319, Validation Loss: 0.6968677459800311  
Accuracy: 0.6706214689265537, Precision: 0.6707122763165901, Recall: 0.6706214689265537, F1-score: 0.6705107076315394

Epoch 9/10 (Train): 100% | ██████████ | 1  
17/117 [00:10<00:00, 10.78sample/s]

Epoch 9/10 (Eval): 100% | ██████████ |  
71/71 [00:03<00:00, 21.71sample/s]

Epoch 9/10, Training Loss: 0.7592605461070928, Validation Loss: 0.6873815650657072  
Accuracy: 0.6694915254237288, Precision: 0.6771719645443356, Recall: 0.6694915254237288, F1-score: 0.6663096076042724

Epoch 10/10 (Train): 100% | ██████████ | 1  
17/117 [00:10<00:00, 10.78sample/s]

Epoch 10/10 (Eval): 100% | ██████████ |  
71/71 [00:03<00:00, 21.76sample/s]

Epoch 10/10, Training Loss: 0.7495182010921573, Validation Loss: 0.6765379700283546  
Accuracy: 0.6836158192090396, Precision: 0.6840412047978125, Recall: 0.6836158192090396, F1-score: 0.6833246402103248

Тренировка завершена!

Test: 100% | ██████████ |  
72/72 [00:04<00:00, 17.44sample/s]

```
Test Accuracy: 0.6878483835005574
Precision: 0.6889830432078177, Recall: 0.6878483835005574, F1-score: 0.6875377786959
848
Accuracy of cats : 72 %
Accuracy of dogs : 65 %
```

```
Class_name: cats
```

```
Train_count: 900
```

```
Test_count: 300
```

```
Valid_count: 300
```

```
Shutil images: 100%|██████████| 150
0/1500 [00:00<00:00, 1793.84image/s]
```

```
Class_name: dogs
```

```
Train_count: 900
```

```
Test_count: 300
```

```
Valid_count: 300
```

```
Shutil images: 100%|██████████| 150
0/1500 [00:00<00:00, 1788.03image/s]
```

---

```
-----
```

Выбранная модель: vgg19

Пользовательское название модели: vgg19\_Exp4

Выбранный оптимизатор: SGD

```
-----
```

```
Epoch 1/10 (Train): 100%|██████████| 1
17/117 [00:11<00:00, 10.32sample/s]
Epoch 1/10 (Eval): 100%|██████████| 1
71/71 [00:03<00:00, 21.14sample/s]
```

```
Epoch 1/10, Training Loss: 0.7849684713677726, Validation Loss: 0.7799069361161377
Accuracy: 0.4966101694915254, Precision: 0.2466216604424016, Recall: 0.4966101694915
254, F1-score: 0.329573679866403
```

```
Epoch 2/10 (Train): 100%|██████████| 1
17/117 [00:11<00:00, 10.47sample/s]
Epoch 2/10 (Eval): 100%|██████████| 1
71/71 [00:03<00:00, 21.37sample/s]
```

```
Epoch 2/10, Training Loss: 0.7803726502482903, Validation Loss: 0.7782230409188459
Accuracy: 0.5056497175141242, Precision: 0.6836190513128806, Recall: 0.5056497175141
242, F1-score: 0.35215107654686933
```

```
Epoch 3/10 (Train): 100%|██████████| 1
17/117 [00:11<00:00, 10.45sample/s]
Epoch 3/10 (Eval): 100%|██████████| 1
71/71 [00:03<00:00, 21.39sample/s]
```

```
Epoch 3/10, Training Loss: 0.7794537446815891, Validation Loss: 0.7771354290725148
Accuracy: 0.5090395480225989, Precision: 0.6860033119033704, Recall: 0.5090395480225
989, F1-score: 0.3602534949499396
```

```
Epoch 4/10 (Train): 100%|██████████| 1
17/117 [00:11<00:00, 10.45sample/s]
Epoch 4/10 (Eval): 100%|██████████| 1
71/71 [00:03<00:00, 21.11sample/s]
```

Epoch 4/10, Training Loss: 0.7792518749639055, Validation Loss: 0.7752847503134086  
Accuracy: 0.5706214689265536, Precision: 0.6310303560515734, Recall: 0.5706214689265  
536, F1-score: 0.5117316995711065

Epoch 5/10 (Train): 100% | ██████████ | 1  
17/117 [00:11<00:00, 10.49sample/s]  
Epoch 5/10 (Eval): 100% | ██████████ |  
71/71 [00:03<00:00, 21.12sample/s]

Epoch 5/10, Training Loss: 0.7766245838875147, Validation Loss: 0.7737254815249793  
Accuracy: 0.6175141242937853, Precision: 0.6377890987840347, Recall: 0.6175141242937  
853, F1-score: 0.6016529020464059

Epoch 6/10 (Train): 100% | ██████████ | 1  
17/117 [00:11<00:00, 10.35sample/s]  
Epoch 6/10 (Eval): 100% | ██████████ |  
71/71 [00:03<00:00, 21.25sample/s]

Epoch 6/10, Training Loss: 0.7763457452090657, Validation Loss: 0.7728819155086906  
Accuracy: 0.5084745762711864, Precision: 0.6519947848761408, Recall: 0.5084745762711  
864, F1-score: 0.35120798404676395

Epoch 7/10 (Train): 100% | ██████████ | 1  
17/117 [00:11<00:00, 10.43sample/s]  
Epoch 7/10 (Eval): 100% | ██████████ |  
71/71 [00:03<00:00, 21.19sample/s]

Epoch 7/10, Training Loss: 0.7761543030768244, Validation Loss: 0.7704966152455174  
Accuracy: 0.5813559322033899, Precision: 0.6529945653034339, Recall: 0.5813559322033  
899, F1-score: 0.5232971286314404

Epoch 8/10 (Train): 100% | ██████████ | 1  
17/117 [00:11<00:00, 10.49sample/s]  
Epoch 8/10 (Eval): 100% | ██████████ |  
71/71 [00:03<00:00, 21.28sample/s]

Epoch 8/10, Training Loss: 0.7720979464593368, Validation Loss: 0.767404685417811  
Accuracy: 0.6338983050847458, Precision: 0.6363086817248024, Recall: 0.6338983050847  
458, F1-score: 0.6326347116657465

Epoch 9/10 (Train): 100% | ██████████ | 1  
17/117 [00:11<00:00, 10.30sample/s]  
Epoch 9/10 (Eval): 100% | ██████████ |  
71/71 [00:03<00:00, 20.20sample/s]

Epoch 9/10, Training Loss: 0.7709157312259517, Validation Loss: 0.7637092722001049  
Accuracy: 0.6350282485875707, Precision: 0.646833016253351, Recall: 0.63502824858757  
07, F1-score: 0.6267197740112995

Epoch 10/10 (Train): 100% | ██████████ | 1  
17/117 [00:11<00:00, 10.31sample/s]  
Epoch 10/10 (Eval): 100% | ██████████ |  
71/71 [00:03<00:00, 21.12sample/s]

Epoch 10/10, Training Loss: 0.7647228571059689, Validation Loss: 0.75905252479564  
Accuracy: 0.5892655367231638, Precision: 0.6432586421526381, Recall: 0.5892655367231  
638, F1-score: 0.5487387013435374

Тренировка завершена!

Test: 100% | ██████████ |  
72/72 [00:04<00:00, 17.41sample/s]

```
Test Accuracy: 0.5869565217391305
Precision: 0.6343213626329477, Recall: 0.5869565217391305, F1-score: 0.5443445437177
384
Accuracy of cats : 27 %
Accuracy of dogs : 88 %
```

```
Class_name: cats
```

```
Train_count: 900
```

```
Test_count: 300
```

```
Valid_count: 300
```

```
Shutil images: 100%|██████████| 150
0/1500 [00:00<00:00, 1803.84image/s]
```

```
Class_name: dogs
```

```
Train_count: 900
```

```
Test_count: 300
```

```
Valid_count: 300
```

```
Shutil images: 100%|██████████| 150
0/1500 [00:00<00:00, 1798.13image/s]
```

---

```
-----
```

Выбранная модель: vgg19\_bn

Пользовательское название модели: vgg19\_bn\_Exp4

Выбранный оптимизатор: SGD

```
-----
```

```
Epoch 1/10 (Train): 100%|██████████| 1
17/117 [00:11<00:00, 9.84sample/s]
Epoch 1/10 (Eval): 100%|██████████| 1
71/71 [00:03<00:00, 21.00sample/s]
```

```
Epoch 1/10, Training Loss: 1.2729264656471178, Validation Loss: 0.8231256645446443
Accuracy: 0.503954802259887, Precision: 0.5209626756523913, Recall: 0.50395480225988
7, F1-score: 0.3442746925522054
```

```
Epoch 2/10 (Train): 100%|██████████| 1
17/117 [00:11<00:00, 10.14sample/s]
Epoch 2/10 (Eval): 100%|██████████| 1
71/71 [00:03<00:00, 20.83sample/s]
```

```
Epoch 2/10, Training Loss: 0.9208162202665134, Validation Loss: 0.7637248175629114
Accuracy: 0.5757062146892655, Precision: 0.5785453122863605, Recall: 0.575706214689
655, F1-score: 0.5707084990417135
```

```
Epoch 3/10 (Train): 100%|██████████| 1
17/117 [00:11<00:00, 9.98sample/s]
Epoch 3/10 (Eval): 100%|██████████| 1
71/71 [00:03<00:00, 20.95sample/s]
```

```
Epoch 3/10, Training Loss: 0.8620038588542167, Validation Loss: 0.7599142315024037
Accuracy: 0.5785310734463277, Precision: 0.6006800863021408, Recall: 0.5785310734463
277, F1-score: 0.5561269433403367
```

```
Epoch 4/10 (Train): 100%|██████████| 1
17/117 [00:11<00:00, 10.10sample/s]
Epoch 4/10 (Eval): 100%|██████████| 1
71/71 [00:03<00:00, 20.86sample/s]
```

Epoch 4/10, Training Loss: 0.829971239552913, Validation Loss: 0.7447905446176475  
Accuracy: 0.5994350282485875, Precision: 0.6185959652456049, Recall: 0.5994350282485875, F1-score: 0.5810050839506613

Epoch 5/10 (Train): 100% | [██████████] | 1  
17/117 [00:11<00:00, 10.07sample/s]

Epoch 5/10 (Eval): 100% | [██████████] |  
71/71 [00:03<00:00, 20.82sample/s]

Epoch 5/10, Training Loss: 0.7914900931289051, Validation Loss: 0.7311802567061731  
Accuracy: 0.6372881355932203, Precision: 0.638920265625558, Recall: 0.6372881355932203, F1-score: 0.6358853997427921

Epoch 6/10 (Train): 100% | [██████████] | 1  
17/117 [00:11<00:00, 10.09sample/s]

Epoch 6/10 (Eval): 100% | [██████████] |  
71/71 [00:03<00:00, 20.87sample/s]

Epoch 6/10, Training Loss: 0.8057376234150652, Validation Loss: 0.7350737058510215  
Accuracy: 0.6101694915254238, Precision: 0.6341671797062481, Recall: 0.6101694915254238, F1-score: 0.590465250157193

Epoch 7/10 (Train): 100% | [██████████] | 1  
17/117 [00:11<00:00, 10.05sample/s]

Epoch 7/10 (Eval): 100% | [██████████] |  
71/71 [00:03<00:00, 20.88sample/s]

Epoch 7/10, Training Loss: 0.7799350511668234, Validation Loss: 0.7329436903451122  
Accuracy: 0.6090395480225989, Precision: 0.6735101554766767, Recall: 0.6090395480225989, F1-score: 0.5671623011468356

Epoch 8/10 (Train): 100% | [██████████] | 1  
17/117 [00:11<00:00, 10.05sample/s]

Epoch 8/10 (Eval): 100% | [██████████] |  
71/71 [00:03<00:00, 20.85sample/s]

Epoch 8/10, Training Loss: 0.7751597210182729, Validation Loss: 0.7083580025845329  
Accuracy: 0.6598870056497175, Precision: 0.6626656722575619, Recall: 0.6598870056497175, F1-score: 0.6581020081564598

Epoch 9/10 (Train): 100% | [██████████] | 1  
17/117 [00:11<00:00, 10.06sample/s]

Epoch 9/10 (Eval): 100% | [██████████] |  
71/71 [00:03<00:00, 20.93sample/s]

Epoch 9/10, Training Loss: 0.7771442191620409, Validation Loss: 0.7169046693265775  
Accuracy: 0.6265536723163841, Precision: 0.6728760900148096, Recall: 0.6265536723163841, F1-score: 0.5983037875907152

Epoch 10/10 (Train): 100% | [██████████] | 1  
17/117 [00:11<00:00, 10.02sample/s]

Epoch 10/10 (Eval): 100% | [██████████] |  
71/71 [00:03<00:00, 20.29sample/s]

Epoch 10/10, Training Loss: 0.7569173615096447, Validation Loss: 0.7032542435799615  
Accuracy: 0.6598870056497175, Precision: 0.6631941444841267, Recall: 0.6598870056497175, F1-score: 0.6584747880516955

Тренировка завершена!

Test: 100% | [██████████] |  
72/72 [00:04<00:00, 16.98sample/s]

```
Test Accuracy: 0.6688963210702341
Precision: 0.6711578590919985, Recall: 0.6688963210702341, F1-score: 0.6674863399332
582
Accuracy of cats : 60 %
Accuracy of dogs : 73 %
```

```
Class_name: cats
```

```
Train_count: 900
```

```
Test_count: 300
```

```
Valid_count: 300
```

```
Shutil images: 100%|██████████| 150
0/1500 [00:00<00:00, 1826.98image/s]
```

```
Class_name: dogs
```

```
Train_count: 900
```

```
Test_count: 300
```

```
Valid_count: 300
```

```
Shutil images: 100%|██████████| 150
0/1500 [00:00<00:00, 1705.90image/s]
```

---

```
-----
```

Выбранная модель: vit\_b\_16

Пользовательское название модели: vit\_b\_16\_Exp4

Выбранный оптимизатор: SGD

```
-----
```

```
Epoch 1/10 (Train):  0%
| 0/117 [00:00<?, ?sample/s]
```

16:46:54-099788 ERROR

GraduateModel

Traceback (most recent call last)

```
in graduate:59
  56 |         num_workers=num_workers,
  57 |         pin_memory=pin_memory,
  58 |         seed=seed)
> 59 |         train.graduate()
  60 |     except Exception as ex:
  61 |         log.exception("GraduateModel\"
  62 |
```

```
in graduate:111
  108 |         # Выводим информацию
  109 |         print(self.__str__())
  110 |         # Обучаем
> 111 |         self.train_model()
  112 |         # Тестируем
  113 |         self.evaluate_model()
  114 |
```

```
in train_model:417
  414 |             unit=
  415 |             inputs, labels = inputs.cuda()
  416 |             self.optimizer.zero_grad()
> 417 |             outputs = self.model(inputs)
  418 |             loss = self.criterion(outputs)
  419 |             loss.backward()
  420 |             self.optimizer.step()
```

```
C:\Users\NightMare\PycharmProjects\CVtools\venv\lib\site-packages\torch\nn\functional.py:1130 in _call_impl
```

```
1127 |         # this function, and just call forward
1128 |         if not (self._backward_hooks or self._global_backward_hooks
1129 |                 or self._global_forward_hooks or
> 1130 |                 return forward_call(*input, **kwargs)
1131 |             # Do not call functions when jit is used
1132 |             full_backward_hooks, non_full_backward_hooks
1133 |             if self._backward_hooks or self._global_backward_hooks or self._global_forward_hooks)
```

```
C:\Users\NightMare\PycharmProjects\CVtools\venv\lib\site-packages\torchvision\models\detection\transformer.py:291 in forward
```

```
288 |
289 |     def forward(self, x: torch.Tensor):
290 |         # Reshape and permute the input tensor
> 291 |         x = self._process_input(x)
292 |         n = x.shape[0]
293 |
294 |         # Expand the class token to the full
```

```
C:\Users\NightMare\PycharmProjects\CVtools\venv\lib  
ision_transformer.py:271 in _process_input
```

```
268     def _process_input(self, x: torch.Tensor  
269         n, c, h, w = x.shape  
270         p = self.patch_size  
271     torch._assert(h == self.image_size,  
272         torch._assert(w == self.image_size,  
273             n_h = h // p  
274             n_w = w // p
```

```
C:\Users\NightMare\PycharmProjects\CVtools\venv\lib  
3 in _assert
```

```
830     if type(condition) is not torch.Tensor:  
831         return handle_torch_function(_assert  
832             assert condition, message  
833 #####  
834 # Import most common subpackages
```

**AssertionError:** Wrong image height!

```
Class_name: cats  
Train_count: 900  
Test_count: 300  
Valid_count: 300
```

```
Shutil images: 100%|██████████| 150  
0/1500 [00:00<00:00, 1791.35image/s]
```

```
Class_name: dogs  
Train_count: 900  
Test_count: 300  
Valid_count: 300
```

```
Shutil images: 100%|██████████| 150  
0/1500 [00:00<00:00, 1772.36image/s]
```

---

```
-----  
Выбранная модель: vit_b_32  
Пользовательское название модели: vit_b_32_Exp4  
Выбранный оптимизатор: SGD  
-----
```

```
Epoch 1/10 (Train):  0%|  
| 0/117 [00:00<?, ?sample/s]
```

16:46:56-804351 ERROR

GraduateModel

Traceback (most recent call last)

```
in graduate:59
  56 |         num_workers=num_workers,
  57 |         pin_memory=pin_memory,
  58 |         seed=seed)
> 59 |         train.graduate()
  60 |     except Exception as ex:
  61 |         log.exception("GraduateModel\"
  62 |
```

```
in graduate:111
  108 |         # Выводим информацию
  109 |         print(self.__str__())
  110 |         # Обучаем
> 111 |         self.train_model()
  112 |         # Тестируем
  113 |         self.evaluate_model()
  114 |
```

```
in train_model:417
  414 |             unit=
  415 |             inputs, labels = inputs.cuda()
  416 |             self.optimizer.zero_grad()
> 417 |             outputs = self.model(inputs)
  418 |             loss = self.criterion(outputs)
  419 |             loss.backward()
  420 |             self.optimizer.step()
```

```
C:\Users\NightMare\PycharmProjects\CVtools\venv\lib\site-packages\torch\nn\functional.py:1130 in _call_impl
```

```
1127 |         # this function, and just call forward
1128 |         if not (self._backward_hooks or self._global_backward_hooks
1129 |                 or self._global_forward_hooks or
> 1130 |                 return forward_call(*input, **kwargs)
1131 |             # Do not call functions when jit is used
1132 |             full_backward_hooks, non_full_backward_hooks
1133 |             if self._backward_hooks or self._global_backward_hooks
1134 |                 or self._global_forward_hooks)
```

```
C:\Users\NightMare\PycharmProjects\CVtools\venv\lib\site-packages\torch\vision\models\detection\transformer.py:291 in forward
```

```
288 |
289 |     def forward(self, x: torch.Tensor):
290 |         # Reshape and permute the input tensor
> 291 |         x = self._process_input(x)
292 |         n = x.shape[0]
293 |
294 |         # Expand the class token to the full
```

C:\Users\NightMare\PycharmProjects\CVtools\venv\lib\\\_l  
ision\_transformer.py:271 in \_process\_input

```
268     def _process_input(self, x: torch.Tensor
269         n, c, h, w = x.shape
270         p = self.patch_size
271         torch._assert(h == self.image_size,
272                     torch._assert(w == self.image_size,
273                     n_h = h // p
274                     n_w = w // p
```

```
C:\Users\NightMare\PycharmProjects\CVtools\venv\lib  
3 in _assert
```

```
830 |     if type(condition) is not torch.Tensor:
831 |         return handle_torch_function(_assert
832 |             assert condition, message
833 |     #####
834 |
835 # Import most common subpackages
```

**AssertionError:** Wrong image height!

```
Class_name: cats
Train_count: 900
Test_count: 300
Valid_count: 300
Shutil images: 100%|██████████| 150
0/1500 [00:00<00:00, 1758.91image/s]
Class_name: dogs
Train_count: 900
Test_count: 300
Valid_count: 300
Shutil images: 100%|██████████| 150
0/1500 [00:00<00:00, 1729.99image/s]
```

Выбранная модель: wide\_resnet101\_2  
Пользовательское название модели: wide\_resnet101\_2\_Exp4  
Выбранный оптимизатор: SGD

```
Epoch 1/10 (Train): 100%|██████████| 1  
17/117 [00:17<00:00,  6.70sample/s]  
Epoch 1/10 (Eval): 100%|██████████| 1  
71/71 [00:04<00:00, 15.52sample/s]  
Epoch 1/10, Training Loss: 1.6593875953030146, Validation Loss: 0.9219747562866426  
Accuracy: 0.523728813559322, Precision: 0.5236430826353283, Recall: 0.523728813559322,  
F1-score: 0.522357819526623
```

```
Epoch 2/10 (Train): 100%|██████████| 1  
17/117 [00:17<00:00, 6.71sample/s]  
Epoch 2/10 (Eval): 100%|██████████|  
71/71 [00:04<00:00, 15.29sample/s]  
Epoch 2/10, Training Loss: 1.6063223739369754, Validation Loss: 2.3408478962436403  
Accuracy: 0.4966101694915254, Precision: 0.2466216604424016, Recall: 0.4966101694915  
254, F1-score: 0.329573679866403  
Epoch 3/10 (Train): 100%|██████████| 1  
17/117 [00:17<00:00, 6.74sample/s]  
Epoch 3/10 (Eval): 100%|██████████|  
71/71 [00:04<00:00, 15.52sample/s]  
Epoch 3/10, Training Loss: 1.6421952560962758, Validation Loss: 1.6816806265779134  
Accuracy: 0.5033898305084745, Precision: 0.25340132145935074, Recall: 0.503389830508  
4745, F1-score: 0.3371066057745591  
Epoch 4/10 (Train): 100%|██████████| 1  
17/117 [00:17<00:00, 6.79sample/s]  
Epoch 4/10 (Eval): 100%|██████████|  
71/71 [00:04<00:00, 15.35sample/s]  
Epoch 4/10, Training Loss: 1.4252395675433998, Validation Loss: 0.8655710062064693  
Accuracy: 0.5175141242937853, Precision: 0.5173837913908238, Recall: 0.5175141242937  
853, F1-score: 0.5152154194957076  
Epoch 5/10 (Train): 100%|██████████| 1  
17/117 [00:17<00:00, 6.78sample/s]  
Epoch 5/10 (Eval): 100%|██████████|  
71/71 [00:04<00:00, 15.18sample/s]  
Epoch 5/10, Training Loss: 1.304212636699245, Validation Loss: 1.267092322541327  
Accuracy: 0.511864406779661, Precision: 0.6858184697945278, Recall: 0.51186440677966  
1, F1-score: 0.367057495728477  
Epoch 6/10 (Train): 100%|██████████| 1  
17/117 [00:17<00:00, 6.77sample/s]  
Epoch 6/10 (Eval): 100%|██████████|  
71/71 [00:04<00:00, 15.61sample/s]  
Epoch 6/10, Training Loss: 1.3037105397748325, Validation Loss: 1.3331450330840666  
Accuracy: 0.5033898305084745, Precision: 0.25340132145935074, Recall: 0.503389830508  
4745, F1-score: 0.3371066057745591  
Epoch 7/10 (Train): 100%|██████████| 1  
17/117 [00:17<00:00, 6.77sample/s]  
Epoch 7/10 (Eval): 100%|██████████|  
71/71 [00:04<00:00, 15.58sample/s]  
Epoch 00007: reducing learning rate of group 0 to 1.0000e-04.  
Epoch 7/10, Training Loss: 1.2433603059722595, Validation Loss: 0.8720370631265102  
Accuracy: 0.5333333333333333, Precision: 0.5914128326680241, Recall: 0.53333333333333  
333, F1-score: 0.4505388758276557  
Epoch 8/10 (Train): 100%|██████████| 1  
17/117 [00:17<00:00, 6.74sample/s]  
Epoch 8/10 (Eval): 100%|██████████|  
71/71 [00:04<00:00, 15.46sample/s]  
Epoch 8/10, Training Loss: 0.8198458340741577, Validation Loss: 0.7719016427037406  
Accuracy: 0.5446327683615819, Precision: 0.5458928822643128, Recall: 0.5446327683615  
819, F1-score: 0.5427419919761904
```

```
Epoch 9/10 (Train): 100%|██████████| 1  
17/117 [00:17<00:00, 6.79sample/s]  
Epoch 9/10 (Eval): 100%|██████████| 1  
71/71 [00:04<00:00, 15.52sample/s]  
Epoch 9/10, Training Loss: 0.7960331713891831, Validation Loss: 0.7845322353354955  
Accuracy: 0.5440677966101695, Precision: 0.5587360537046797, Recall: 0.5440677966101  
695, F1-score: 0.5175955794543273  
Epoch 10/10 (Train): 100%|██████████| 1  
17/117 [00:17<00:00, 6.77sample/s]  
Epoch 10/10 (Eval): 100%|██████████| 1  
71/71 [00:04<00:00, 15.45sample/s]  
Epoch 10/10, Training Loss: 0.792675376939316, Validation Loss: 0.7715810299929926  
Accuracy: 0.5480225988700564, Precision: 0.5490752822883107, Recall: 0.5480225988700  
564, F1-score: 0.5440144933213157  
Тренировка завершена!  
Test: 100%|██████████| 1  
72/72 [00:04<00:00, 14.66sample/s]  
Test Accuracy: 0.5362318840579711  
Precision: 0.5378189321919964, Recall: 0.5362318840579711, F1-score: 0.5334397236004  
549  
Accuracy of cats : 61 %  
Accuracy of dogs : 45 %  
  
Class_name: cats  
Train_count: 900  
Test_count: 300  
Valid_count: 300  
Shutil images: 100%|██████████| 150  
0/1500 [00:00<00:00, 1822.77image/s]  
Class_name: dogs  
Train_count: 900  
Test_count: 300  
Valid_count: 300  
Shutil images: 100%|██████████| 150  
0/1500 [00:00<00:00, 1688.50image/s]
```

---

Выбранная модель: wide\_resnet50\_2  
Пользовательское название модели: wide\_resnet50\_2\_Exp4  
Выбранный оптимизатор: SGD

---

```
Epoch 1/10 (Train): 100%|██████████| 1  
17/117 [00:11<00:00, 9.81sample/s]  
Epoch 1/10 (Eval): 100%|██████████| 1  
71/71 [00:03<00:00, 19.21sample/s]  
Epoch 1/10, Training Loss: 1.7721034897934336, Validation Loss: 1.543597417194291  
Accuracy: 0.503954802259887, Precision: 0.7501547364689425, Recall: 0.50395480225988  
7, F1-score: 0.3383619970573583
```

```
Epoch 2/10 (Train): 100%|██████████| 1  
17/117 [00:11<00:00, 9.95sample/s]  
Epoch 2/10 (Eval): 100%|██████████|  
71/71 [00:03<00:00, 19.07sample/s]  
Epoch 2/10, Training Loss: 1.5916537759727285, Validation Loss: 0.8178697667889676  
Accuracy: 0.5220338983050847, Precision: 0.521970441011238, Recall: 0.5220338983050847, F1-score: 0.5199767231383294  
Epoch 3/10 (Train): 100%|██████████| 1  
17/117 [00:11<00:00, 9.95sample/s]  
Epoch 3/10 (Eval): 100%|██████████|  
71/71 [00:03<00:00, 19.23sample/s]  
Epoch 3/10, Training Loss: 1.5155914400521004, Validation Loss: 2.1282710850470314  
Accuracy: 0.4966101694915254, Precision: 0.2466216604424016, Recall: 0.4966101694915254, F1-score: 0.329573679866403  
Epoch 4/10 (Train): 100%|██████████| 1  
17/117 [00:11<00:00, 9.97sample/s]  
Epoch 4/10 (Eval): 100%|██████████|  
71/71 [00:03<00:00, 18.95sample/s]  
Epoch 4/10, Training Loss: 1.5966145933042086, Validation Loss: 2.589829918605507  
Accuracy: 0.5033898305084745, Precision: 0.25340132145935074, Recall: 0.5033898305084745, F1-score: 0.3371066057745591  
Epoch 5/10 (Train): 100%|██████████| 1  
17/117 [00:11<00:00, 10.01sample/s]  
Epoch 5/10 (Eval): 100%|██████████|  
71/71 [00:03<00:00, 19.43sample/s]  
Epoch 00005: reducing learning rate of group 0 to 1.0000e-04.  
Epoch 5/10, Training Loss: 1.579668174772903, Validation Loss: 1.2955133145685587  
Accuracy: 0.5045197740112994, Precision: 0.6261478588018504, Recall: 0.5045197740112994, F1-score: 0.34060966396395753  
Epoch 6/10 (Train): 100%|██████████| 1  
17/117 [00:11<00:00, 9.96sample/s]  
Epoch 6/10 (Eval): 100%|██████████|  
71/71 [00:03<00:00, 19.06sample/s]  
Epoch 6/10, Training Loss: 0.8608987182276636, Validation Loss: 0.8039812437221829  
Accuracy: 0.5497175141242938, Precision: 0.5544209722284923, Recall: 0.5497175141242938, F1-score: 0.541927387169586  
Epoch 7/10 (Train): 100%|██████████| 1  
17/117 [00:11<00:00, 9.98sample/s]  
Epoch 7/10 (Eval): 100%|██████████|  
71/71 [00:03<00:00, 19.11sample/s]  
Epoch 7/10, Training Loss: 0.8272874427626115, Validation Loss: 0.7808230595063355  
Accuracy: 0.5598870056497175, Precision: 0.5624321892026312, Recall: 0.5598870056497175, F1-score: 0.5565807379245354  
Epoch 8/10 (Train): 100%|██████████| 1  
17/117 [00:11<00:00, 10.00sample/s]  
Epoch 8/10 (Eval): 100%|██████████|  
71/71 [00:03<00:00, 19.11sample/s]  
Epoch 8/10, Training Loss: 0.8276528053858903, Validation Loss: 0.78991924100003  
Accuracy: 0.5621468926553672, Precision: 0.5656476609433807, Recall: 0.5621468926553672, F1-score: 0.5545581509196897
```

Epoch 9/10 (Train): 100% | 1  
 17/117 [00:11<00:00, 10.07sample/s]  
 Epoch 9/10 (Eval): 100% |  
 71/71 [00:03<00:00, 19.56sample/s]

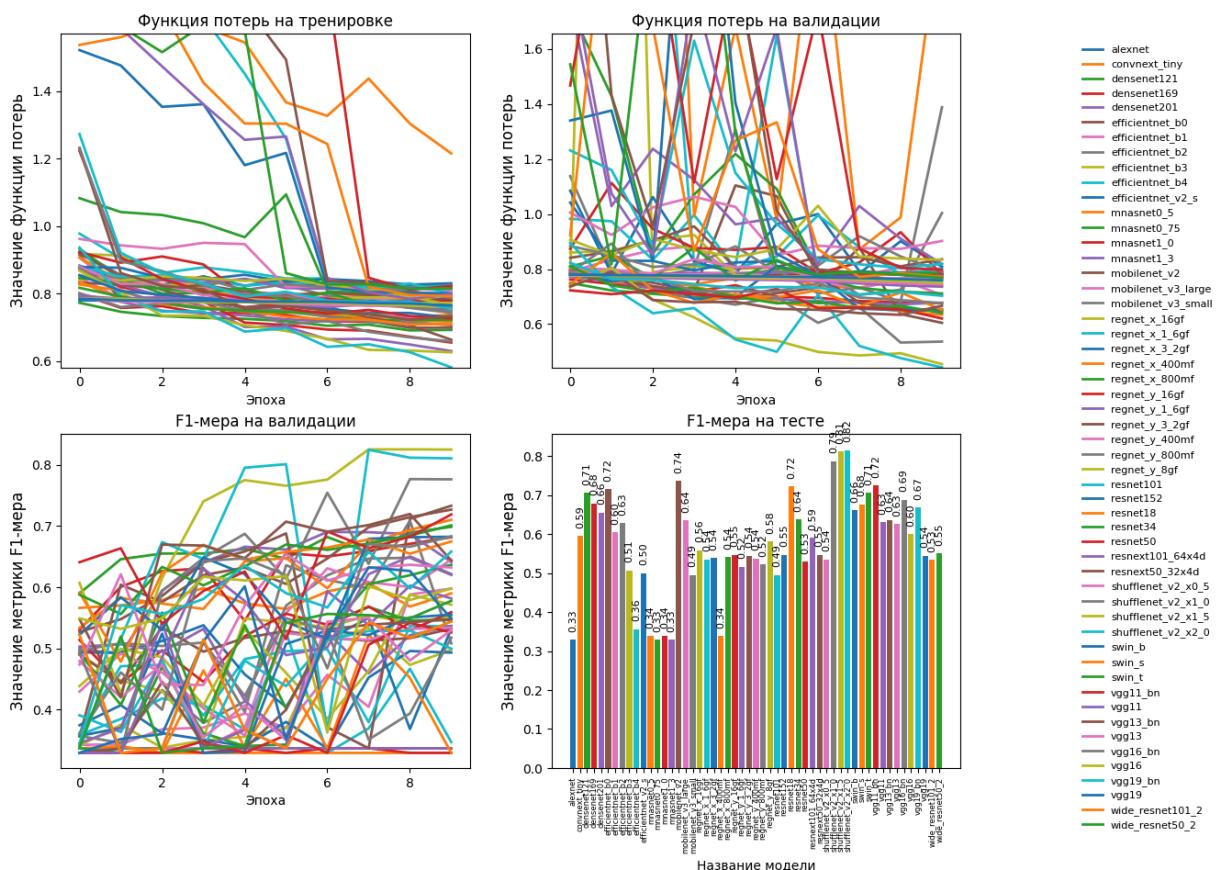
Epoch 9/10, Training Loss: 0.8151828350883547, Validation Loss: 0.7797652462781486  
 Accuracy: 0.5610169491525424, Precision: 0.5694691438504997, Recall: 0.5610169491525424, F1-score: 0.5493508586072356

Epoch 10/10 (Train): 100% | 1  
 17/117 [00:11<00:00, 10.06sample/s]  
 Epoch 10/10 (Eval): 100% |  
 71/71 [00:03<00:00, 19.30sample/s]

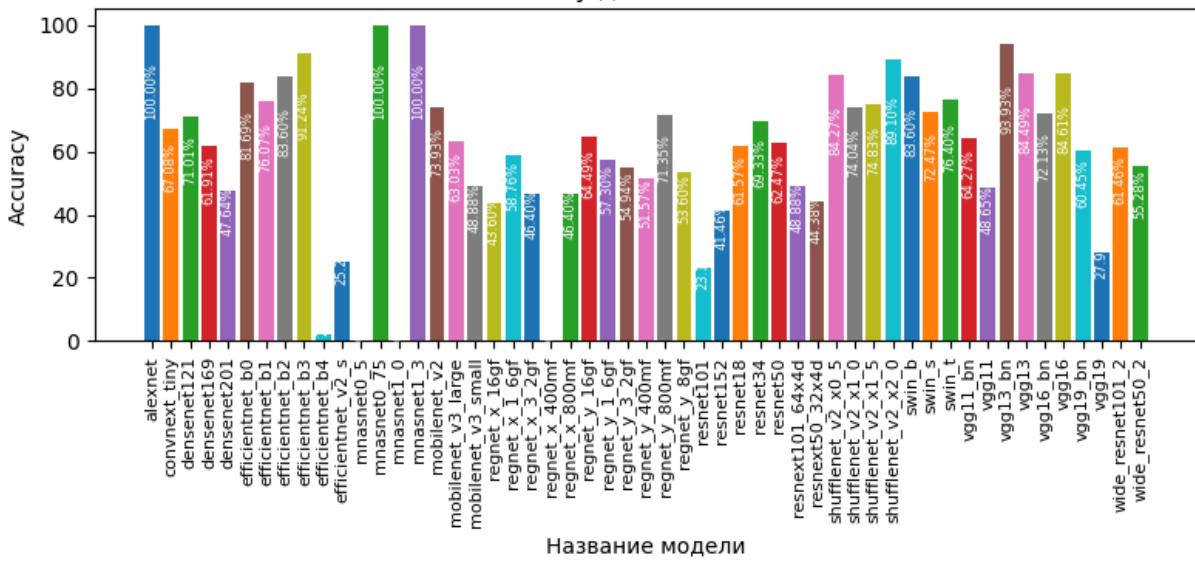
Epoch 10/10, Training Loss: 0.8153174205787219, Validation Loss: 0.7680236875674146  
 Accuracy: 0.5779661016949152, Precision: 0.5781260523066563, Recall: 0.5779661016949152, F1-score: 0.5779115401049598

Тренировка завершена!

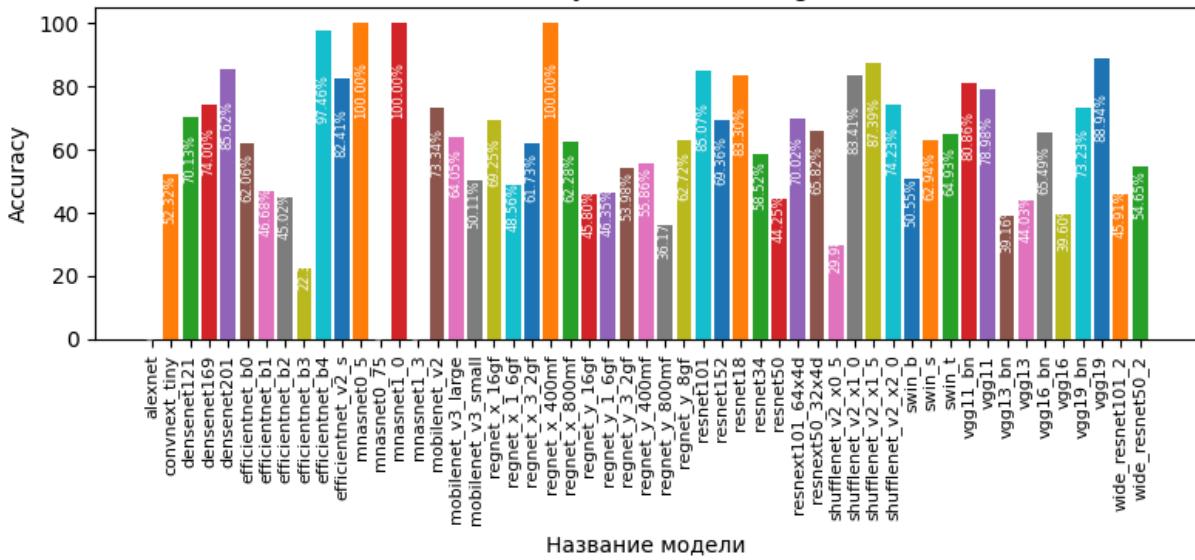
Test: 100% | 1  
 72/72 [00:04<00:00, 17.10sample/s]  
 Test Accuracy: 0.5496098104793757  
 Precision: 0.5496657109057187, Recall: 0.5496098104793757, F1-score: 0.5496131690603706  
 Accuracy of cats : 55 %  
 Accuracy of dogs : 54 %



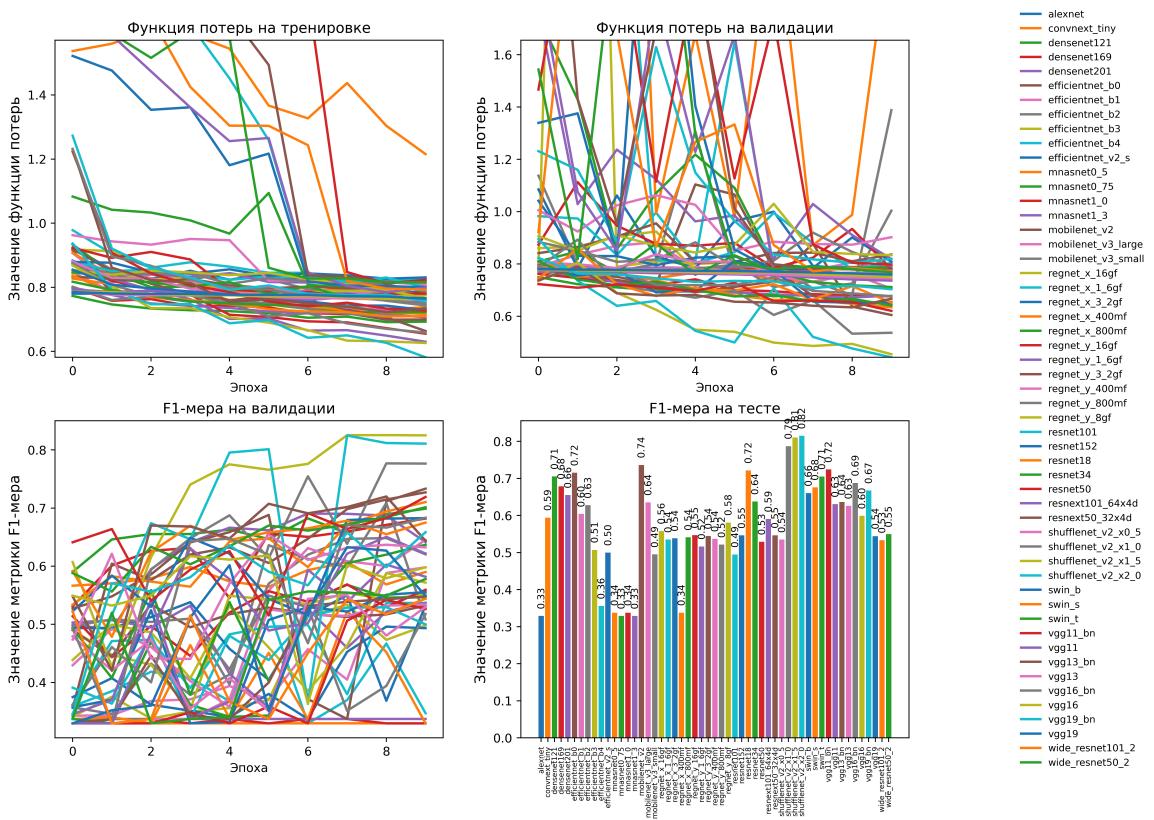
Accuracy для класса: cats

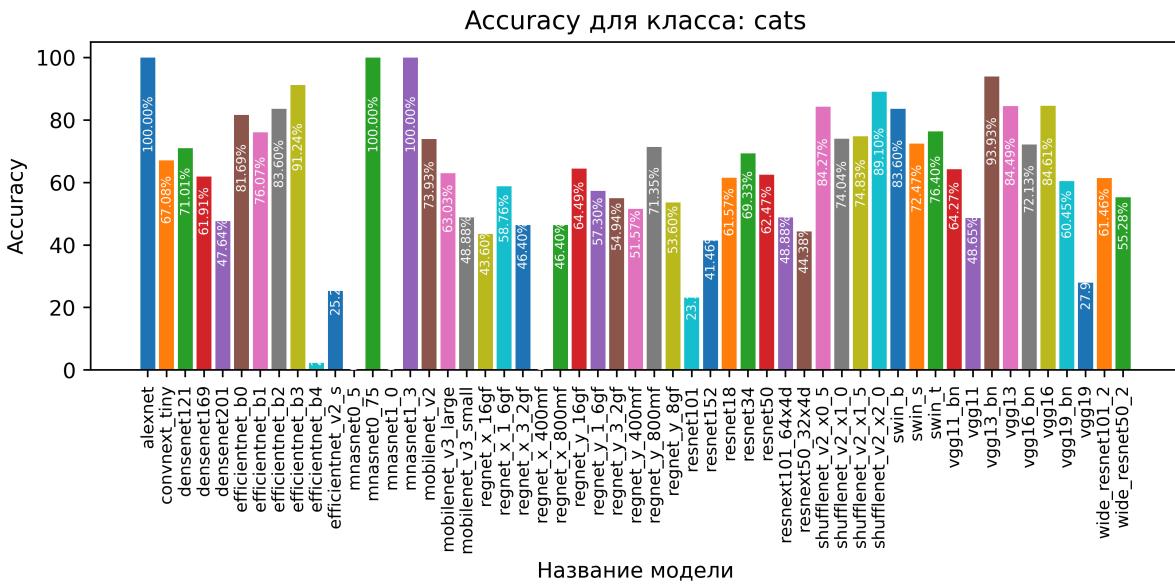


Accuracy для класса: dogs



```
In [224]: ipd.display(ipd.Image(filename="./plot/PlotsMetrics_Exp4.png"))
ipd.display(ipd.Image(filename="./plot/AccuracyForClass_Exp4.png"))
```





## Длительное обучение + лучший эксп

```
In [229...]: graduate_pipeline = validate_with_pydantic(EntryGraduateModel)(GraduateModelPipeline)
entry = {
    "prefix": "CatsVsDogs",
    "models": ["shufflenet_v2_x2_0"],
    "name_optimizers": ["AdamW"],
    "name_loss": "CrossEntropyLoss",
    "ratio": (70, 15, 15),
    "size_img": (64, 64),
    "batch_size": 25,
    "num_epochs": 50,
    "class_percentage": {"cats": 0.3, "dogs": 1.0},
    "is_use_class_weights": True,
    "resampling_method": "undersampling"
}
)
```

```
In [230...]: graduate_pipeline.graduate()
```

```
Class_name: cats
Train_count: 900
Test_count: 300
Valid_count: 300
Shutil images: 100%|██████████| 150
0/1500 [00:00<00:00, 1672.74image/s]
Class_name: dogs
Train_count: 900
Test_count: 300
Valid_count: 300
Shutil images: 100%|██████████| 150
0/1500 [00:00<00:00, 1744.52image/s]
```

---

```
-----  
Выбранная модель: shufflenet_v2_x2_0
Пользовательское название модели: shufflenet_v2_x2_0_CatsVsDogs
Выбранный оптимизатор: AdamW
```

---

```
Epoch 1/50 (Train): 100%|██████████| 1
17/117 [00:12<00:00, 9.71sample/s]
Epoch 1/50 (Eval): 100%|██████████| 1
71/71 [00:03<00:00, 20.91sample/s]
Epoch 1/50, Training Loss: 0.7818373362837788, Validation Loss: 0.6694855243809479
Accuracy: 0.5694915254237288, Precision: 0.6259043600036523, Recall: 0.5694915254237288,
F1-score: 0.5121810434321343
Epoch 2/50 (Train): 100%|██████████| 1
17/117 [00:11<00:00, 9.80sample/s]
Epoch 2/50 (Eval): 100%|██████████| 1
71/71 [00:03<00:00, 21.13sample/s]
Epoch 2/50, Training Loss: 0.6892301994295874, Validation Loss: 0.5868471929077375
Accuracy: 0.6949152542372882, Precision: 0.70726470729754, Recall: 0.6949152542372882,
F1-score: 0.6907329032979306
Epoch 3/50 (Train): 100%|██████████| 1
17/117 [00:11<00:00, 9.84sample/s]
Epoch 3/50 (Eval): 100%|██████████| 1
71/71 [00:03<00:00, 20.94sample/s]
Epoch 3/50, Training Loss: 0.6723110473033079, Validation Loss: 0.6207994846469265
Accuracy: 0.7220338983050848, Precision: 0.7373563794846172, Recall: 0.7220338983050848,
F1-score: 0.7170879401596207
Epoch 4/50 (Train): 100%|██████████| 1
17/117 [00:11<00:00, 9.95sample/s]
Epoch 4/50 (Eval): 100%|██████████| 1
71/71 [00:03<00:00, 21.49sample/s]
Epoch 4/50, Training Loss: 0.6442985593555719, Validation Loss: 0.57820005058232
Accuracy: 0.7220338983050848, Precision: 0.7642705665649281, Recall: 0.7220338983050848,
F1-score: 0.7098850827513163
```

Epoch 5/50 (Train): 100% | 1  
17/117 [00:11<00:00, 10.39sample/s]  
Epoch 5/50 (Eval): 100% |  
71/71 [00:03<00:00, 21.62sample/s]  
Epoch 5/50, Training Loss: 0.6076265445484739, Validation Loss: 0.48135274160379743  
Accuracy: 0.7977401129943503, Precision: 0.8075697836585299, Recall: 0.7977401129943503, F1-score: 0.7959464857612887

Epoch 6/50 (Train): 100% | 1  
17/117 [00:12<00:00, 9.75sample/s]  
Epoch 6/50 (Eval): 100% |  
71/71 [00:03<00:00, 20.63sample/s]  
Epoch 6/50, Training Loss: 0.5862973091221347, Validation Loss: 0.5020454996554865  
Accuracy: 0.772316384180791, Precision: 0.7874293999458878, Recall: 0.772316384180791, F1-score: 0.7690341009658702

Epoch 7/50 (Train): 100% | 1  
17/117 [00:12<00:00, 9.69sample/s]  
Epoch 7/50 (Eval): 100% |  
71/71 [00:03<00:00, 21.13sample/s]  
Epoch 7/50, Training Loss: 0.5642907366002958, Validation Loss: 0.4461560648376659  
Accuracy: 0.7932203389830509, Precision: 0.7936494699986005, Recall: 0.7932203389830509, F1-score: 0.793106202488199

Epoch 8/50 (Train): 100% | 1  
17/117 [00:11<00:00, 9.90sample/s]  
Epoch 8/50 (Eval): 100% |  
71/71 [00:03<00:00, 21.52sample/s]  
Epoch 8/50, Training Loss: 0.5617299373309637, Validation Loss: 0.5760649809729581  
Accuracy: 0.6802259887005649, Precision: 0.707756734136366, Recall: 0.6802259887005649, F1-score: 0.6685534898278673

Epoch 9/50 (Train): 100% | 1  
17/117 [00:11<00:00, 10.26sample/s]  
Epoch 9/50 (Eval): 100% |  
71/71 [00:03<00:00, 21.52sample/s]  
Epoch 9/50, Training Loss: 0.5528948945073328, Validation Loss: 0.420026018542085  
Accuracy: 0.8355932203389831, Precision: 0.8393900195963833, Recall: 0.8355932203389831, F1-score: 0.8350578299339264

Epoch 10/50 (Train): 100% | 1  
17/117 [00:11<00:00, 10.35sample/s]  
Epoch 10/50 (Eval): 100% |  
71/71 [00:03<00:00, 21.23sample/s]  
Epoch 10/50, Training Loss: 0.5245235834744378, Validation Loss: 0.39620387457353246  
Accuracy: 0.8502824858757062, Precision: 0.8587402561526826, Recall: 0.8502824858757062, F1-score: 0.8493000109992174

Epoch 11/50 (Train): 100% | 1  
17/117 [00:11<00:00, 10.47sample/s]  
Epoch 11/50 (Eval): 100% |  
71/71 [00:03<00:00, 21.94sample/s]  
Epoch 11/50, Training Loss: 0.5101999232347069, Validation Loss: 0.4111338718294424  
Accuracy: 0.8271186440677966, Precision: 0.8376990902824529, Recall: 0.8271186440677966, F1-score: 0.8256226410973266

Epoch 12/50 (Train): 100% | 1  
17/117 [00:11<00:00, 10.45sample/s]  
Epoch 12/50 (Eval): 100% |  
71/71 [00:03<00:00, 21.60sample/s]

Epoch 12/50, Training Loss: 0.5112812127341929, Validation Loss: 0.3383596908658911  
Accuracy: 0.8615819209039548, Precision: 0.8642746420068933, Recall: 0.8615819209039548, F1-score: 0.8613728957053395

Epoch 13/50 (Train): 100% | [██████████] | 1  
17/117 [00:12<00:00, 9.61sample/s]

Epoch 13/50 (Eval): 100% | [██████████] |  
71/71 [00:03<00:00, 21.80sample/s]

Epoch 13/50, Training Loss: 0.49093836906951727, Validation Loss: 0.33242142053142104  
Accuracy: 0.868361581920904, Precision: 0.869445578925873, Recall: 0.868361581920904, F1-score: 0.8682358405581891

Epoch 14/50 (Train): 100% | [██████████] | 1  
17/117 [00:11<00:00, 9.97sample/s]

Epoch 14/50 (Eval): 100% | [██████████] |  
71/71 [00:03<00:00, 21.42sample/s]

Epoch 14/50, Training Loss: 0.4707408593487494, Validation Loss: 0.34258391007275907  
Accuracy: 0.8395480225988701, Precision: 0.8667778165556675, Recall: 0.8395480225988701, F1-score: 0.8363337371160581

Epoch 15/50 (Train): 100% | [██████████] | 1  
17/117 [00:12<00:00, 9.63sample/s]

Epoch 15/50 (Eval): 100% | [██████████] |  
71/71 [00:03<00:00, 20.77sample/s]

Epoch 15/50, Training Loss: 0.470548668524244, Validation Loss: 0.3387504367336715  
Accuracy: 0.8514124293785311, Precision: 0.8532726430695913, Recall: 0.8514124293785311, F1-score: 0.8512599161954753

Epoch 16/50 (Train): 100% | [██████████] | 1  
17/117 [00:11<00:00, 10.04sample/s]

Epoch 16/50 (Eval): 100% | [██████████] |  
71/71 [00:03<00:00, 21.47sample/s]

Epoch 16/50, Training Loss: 0.4530635595936136, Validation Loss: 0.2722815352644624  
Accuracy: 0.9028248587570622, Precision: 0.9041826901834462, Recall: 0.9028248587570622, F1-score: 0.902721496938918

Epoch 17/50 (Train): 100% | [██████████] | 1  
17/117 [00:11<00:00, 10.21sample/s]

Epoch 17/50 (Eval): 100% | [██████████] |  
71/71 [00:03<00:00, 21.80sample/s]

Epoch 17/50, Training Loss: 0.4424701850490062, Validation Loss: 0.24434111223129903  
Accuracy: 0.9107344632768362, Precision: 0.9142392040596609, Recall: 0.9107344632768362, F1-score: 0.9105142185068628

Epoch 18/50 (Train): 100% | [██████████] | 1  
17/117 [00:11<00:00, 10.39sample/s]

Epoch 18/50 (Eval): 100% | [██████████] |  
71/71 [00:03<00:00, 21.70sample/s]

Epoch 18/50, Training Loss: 0.42650115687105666, Validation Loss: 0.2561664727574351  
Accuracy: 0.9022598870056497, Precision: 0.9031553383328276, Recall: 0.9022598870056497, F1-score: 0.9022227826617181

Epoch 19/50 (Train): 100% | [██████████] | 1  
17/117 [00:11<00:00, 10.42sample/s]

Epoch 19/50 (Eval): 100% | [██████████] |  
71/71 [00:03<00:00, 21.70sample/s]

Epoch 19/50, Training Loss: 0.4317600738346781, Validation Loss: 0.23156479179943348  
Accuracy: 0.9135593220338983, Precision: 0.9150819237106712, Recall: 0.9135593220338983, F1-score: 0.9134993340250046

```
Epoch 20/50 (Train): 100%|██████████| 1  
17/117 [00:12<00:00, 9.62sample/s]  
Epoch 20/50 (Eval): 100%|██████████|  
71/71 [00:03<00:00, 22.30sample/s]  
Epoch 20/50, Training Loss: 0.4241313112714037, Validation Loss: 0.1880631029269116  
Accuracy: 0.9384180790960452, Precision: 0.9389028456704968, Recall: 0.9384180790960  
452, F1-score: 0.9384083875361913  
Epoch 21/50 (Train): 100%|██████████| 1  
17/117 [00:11<00:00, 9.84sample/s]  
Epoch 21/50 (Eval): 100%|██████████|  
71/71 [00:03<00:00, 21.59sample/s]  
Epoch 21/50, Training Loss: 0.39462606066076206, Validation Loss: 0.2670934485471518  
Accuracy: 0.8903954802259887, Precision: 0.9038246060017565, Recall: 0.8903954802259  
887, F1-score: 0.8893996998145082  
Epoch 22/50 (Train): 100%|██████████| 1  
17/117 [00:12<00:00, 9.63sample/s]  
Epoch 22/50 (Eval): 100%|██████████|  
71/71 [00:03<00:00, 21.50sample/s]  
Epoch 22/50, Training Loss: 0.3820356043292485, Validation Loss: 0.19514231011271477  
Accuracy: 0.9214689265536723, Precision: 0.9222660053633263, Recall: 0.9214689265536  
723, F1-score: 0.9214190277085189  
Epoch 23/50 (Train): 100%|██████████| 1  
17/117 [00:12<00:00, 9.70sample/s]  
Epoch 23/50 (Eval): 100%|██████████|  
71/71 [00:03<00:00, 21.36sample/s]  
Epoch 00023: reducing learning rate of group 0 to 1.0000e-04.  
Epoch 23/50, Training Loss: 0.3836238031176357, Validation Loss: 0.19019032537011105  
Accuracy: 0.923728813559322, Precision: 0.9262825643440051, Recall: 0.92372881355932  
2, F1-score: 0.9235924624915021  
Epoch 24/50 (Train): 100%|██████████| 1  
17/117 [00:12<00:00, 9.35sample/s]  
Epoch 24/50 (Eval): 100%|██████████|  
71/71 [00:03<00:00, 21.57sample/s]  
Epoch 24/50, Training Loss: 0.31963706545250115, Validation Loss: 0.1363678809023846  
4  
Accuracy: 0.9536723163841808, Precision: 0.9537267087938693, Recall: 0.9536723163841  
808, F1-score: 0.9536690626367872  
Epoch 25/50 (Train): 100%|██████████| 1  
17/117 [00:12<00:00, 9.63sample/s]  
Epoch 25/50 (Eval): 100%|██████████|  
71/71 [00:03<00:00, 21.47sample/s]  
Epoch 25/50, Training Loss: 0.3043205842017308, Validation Loss: 0.11679077219470578  
Accuracy: 0.9593220338983051, Precision: 0.95977375181101, Recall: 0.959322033898305  
1, F1-score: 0.9593074842473506  
Epoch 26/50 (Train): 100%|██████████| 1  
17/117 [00:12<00:00, 9.62sample/s]  
Epoch 26/50 (Eval): 100%|██████████|  
71/71 [00:03<00:00, 21.55sample/s]  
Epoch 26/50, Training Loss: 0.3116609535829718, Validation Loss: 0.1110397745502618  
Accuracy: 0.9666666666666667, Precision: 0.9670331243672212, Recall: 0.9666666666666  
667, F1-score: 0.9666568205775385
```

```
Epoch 27/50 (Train): 100%|██████████| 1  
17/117 [00:12<00:00, 9.70sample/s]  
Epoch 27/50 (Eval): 100%|██████████| 1  
71/71 [00:03<00:00, 21.11sample/s]  
Epoch 27/50, Training Loss: 0.2859733325278841, Validation Loss: 0.09173322832580172  
Accuracy: 0.9717514124293786, Precision: 0.9717533890633002, Recall: 0.9717514124293  
786, F1-score: 0.9717511599444799  
Epoch 28/50 (Train): 100%|██████████| 1  
17/117 [00:12<00:00, 9.67sample/s]  
Epoch 28/50 (Eval): 100%|██████████| 1  
71/71 [00:03<00:00, 21.11sample/s]  
Epoch 28/50, Training Loss: 0.2681529014739384, Validation Loss: 0.08215596339018164  
Accuracy: 0.980225988700565, Precision: 0.9802405620259196, Recall: 0.98022598870056  
5, F1-score: 0.9802254521542269  
Epoch 29/50 (Train): 100%|██████████| 1  
17/117 [00:12<00:00, 9.47sample/s]  
Epoch 29/50 (Eval): 100%|██████████| 1  
71/71 [00:03<00:00, 21.72sample/s]  
Epoch 29/50, Training Loss: 0.26955263164291265, Validation Loss: 0.0695599283349547  
7  
Accuracy: 0.9819209039548022, Precision: 0.981959184965139, Recall: 0.98192090395480  
22, F1-score: 0.9819199805213252  
Epoch 30/50 (Train): 100%|██████████| 1  
17/117 [00:11<00:00, 9.76sample/s]  
Epoch 30/50 (Eval): 100%|██████████| 1  
71/71 [00:03<00:00, 21.11sample/s]  
Epoch 30/50, Training Loss: 0.24300286674366375, Validation Loss: 0.0568503865782739  
7  
Accuracy: 0.9864406779661017, Precision: 0.986501766602401, Recall: 0.98644067796610  
17, F1-score: 0.9864397256497914  
Epoch 31/50 (Train): 100%|██████████| 1  
17/117 [00:11<00:00, 9.82sample/s]  
Epoch 31/50 (Eval): 100%|██████████| 1  
71/71 [00:03<00:00, 20.97sample/s]  
Epoch 31/50, Training Loss: 0.23211073620673717, Validation Loss: 0.0501694463030303  
6  
Accuracy: 0.9887005649717514, Precision: 0.9887028878773092, Recall: 0.9887005649717  
514, F1-score: 0.988700463977792  
Epoch 32/50 (Train): 100%|██████████| 1  
17/117 [00:12<00:00, 9.66sample/s]  
Epoch 32/50 (Eval): 100%|██████████| 1  
71/71 [00:03<00:00, 20.29sample/s]  
Epoch 32/50, Training Loss: 0.22622125563803816, Validation Loss: 0.0481871590465517  
7  
Accuracy: 0.988135593220339, Precision: 0.9881363073700248, Recall: 0.98813559322033  
9, F1-score: 0.98813563487935  
Epoch 33/50 (Train): 100%|██████████| 1  
17/117 [00:11<00:00, 9.91sample/s]  
Epoch 33/50 (Eval): 100%|██████████| 1  
71/71 [00:03<00:00, 20.95sample/s]  
Epoch 33/50, Training Loss: 0.24440585235549822, Validation Loss: 0.0626289412789678  
1  
Accuracy: 0.9887005649717514, Precision: 0.9887235468735038, Recall: 0.9887005649717  
514, F1-score: 0.9887006948144963
```

```
Epoch 34/50 (Train): 100%|██████████| 1  
17/117 [00:11<00:00, 9.88sample/s]  
Epoch 34/50 (Eval): 100%|██████████| 1  
71/71 [00:03<00:00, 20.96sample/s]  
Epoch 34/50, Training Loss: 0.22247967561802914, Validation Loss: 0.0481614719229187  
3  
Accuracy: 0.9892655367231639, Precision: 0.9892662436592164, Recall: 0.9892655367231  
639, F1-score: 0.9892655744146498  
Epoch 35/50 (Train): 100%|██████████| 1  
17/117 [00:11<00:00, 9.88sample/s]  
Epoch 35/50 (Eval): 100%|██████████| 1  
71/71 [00:03<00:00, 21.27sample/s]  
Epoch 35/50, Training Loss: 0.2167559644188156, Validation Loss: 0.04818941411788517  
4  
Accuracy: 0.9887005649717514, Precision: 0.9887032339853611, Recall: 0.9887005649717  
514, F1-score: 0.9887006371080832  
Epoch 36/50 (Train): 100%|██████████| 1  
17/117 [00:11<00:00, 9.93sample/s]  
Epoch 36/50 (Eval): 100%|██████████| 1  
71/71 [00:03<00:00, 20.98sample/s]  
Epoch 36/50, Training Loss: 0.22382981672601396, Validation Loss: 0.0452831905403590  
15  
Accuracy: 0.9903954802259887, Precision: 0.990396032807224, Recall: 0.99039548022598  
87, F1-score: 0.9903954403697874  
Epoch 37/50 (Train): 100%|██████████| 1  
17/117 [00:11<00:00, 9.78sample/s]  
Epoch 37/50 (Eval): 100%|██████████| 1  
71/71 [00:03<00:00, 21.15sample/s]  
Epoch 37/50, Training Loss: 0.21267975743898412, Validation Loss: 0.0422869112979262  
9  
Accuracy: 0.9915254237288136, Precision: 0.9915259864094448, Recall: 0.9915254237288  
136, F1-score: 0.9915253885615772  
Epoch 38/50 (Train): 100%|██████████| 1  
17/117 [00:12<00:00, 9.72sample/s]  
Epoch 38/50 (Eval): 100%|██████████| 1  
71/71 [00:03<00:00, 21.05sample/s]  
Epoch 38/50, Training Loss: 0.2141230811854613, Validation Loss: 0.04561066922947428  
Accuracy: 0.9903954802259887, Precision: 0.9904013361337817, Recall: 0.9903954802259  
887, F1-score: 0.9903955630019275  
Epoch 39/50 (Train): 100%|██████████| 1  
17/117 [00:12<00:00, 9.63sample/s]  
Epoch 39/50 (Eval): 100%|██████████| 1  
71/71 [00:03<00:00, 21.03sample/s]  
Epoch 39/50, Training Loss: 0.19667671478107007, Validation Loss: 0.0423736569319067  
7  
Accuracy: 0.9903954802259887, Precision: 0.990396179948408, Recall: 0.99039548022598  
87, F1-score: 0.99039551394995  
Epoch 40/50 (Train): 100%|██████████| 1  
17/117 [00:12<00:00, 9.55sample/s]  
Epoch 40/50 (Eval): 100%|██████████| 1  
71/71 [00:03<00:00, 21.81sample/s]
```

Epoch 40/50, Training Loss: 0.19763230432554618, Validation Loss: 0.0384061544039155  
1  
Accuracy: 0.9915254237288136, Precision: 0.991531266652332, Recall: 0.99152542372881  
36, F1-score: 0.9915254967664067

Epoch 41/50 (Train): 100% | 1  
17/117 [00:12<00:00, 9.72sample/s]

Epoch 41/50 (Eval): 100% |  
71/71 [00:03<00:00, 21.33sample/s]

Epoch 41/50, Training Loss: 0.1953434751231441, Validation Loss: 0.03686993781708728  
Accuracy: 0.9915254237288136, Precision: 0.9915414375037762, Recall: 0.9915254237288  
136, F1-score: 0.991525518406208

Epoch 42/50 (Train): 100% | 1  
17/117 [00:11<00:00, 9.78sample/s]

Epoch 42/50 (Eval): 100% |  
71/71 [00:03<00:00, 21.26sample/s]

Epoch 42/50, Training Loss: 0.16657413897517415, Validation Loss: 0.0389134201371126  
8  
Accuracy: 0.988135593220339, Precision: 0.9881409302477784, Recall: 0.98813559322033  
9, F1-score: 0.9881354227914547

Epoch 43/50 (Train): 100% | 1  
17/117 [00:12<00:00, 9.74sample/s]

Epoch 43/50 (Eval): 100% |  
71/71 [00:03<00:00, 21.27sample/s]

Epoch 43/50, Training Loss: 0.18930653459632518, Validation Loss: 0.0373300678296656  
6  
Accuracy: 0.9898305084745763, Precision: 0.9898328544649098, Recall: 0.9898305084745  
763, F1-score: 0.9898304175800128

Epoch 44/50 (Train): 100% | 1  
17/117 [00:12<00:00, 9.56sample/s]

Epoch 44/50 (Eval): 100% |  
71/71 [00:03<00:00, 21.53sample/s]

Epoch 00044: reducing learning rate of group 0 to 1.0000e-05.

Epoch 44/50, Training Loss: 0.18798949656515188, Validation Loss: 0.0406065234706584  
5  
Accuracy: 0.9898305084745763, Precision: 0.9898305084745763, Recall: 0.9898305084745  
763, F1-score: 0.9898305084745763

Epoch 45/50 (Train): 100% | 1  
17/117 [00:12<00:00, 9.58sample/s]

Epoch 45/50 (Eval): 100% |  
71/71 [00:03<00:00, 20.84sample/s]

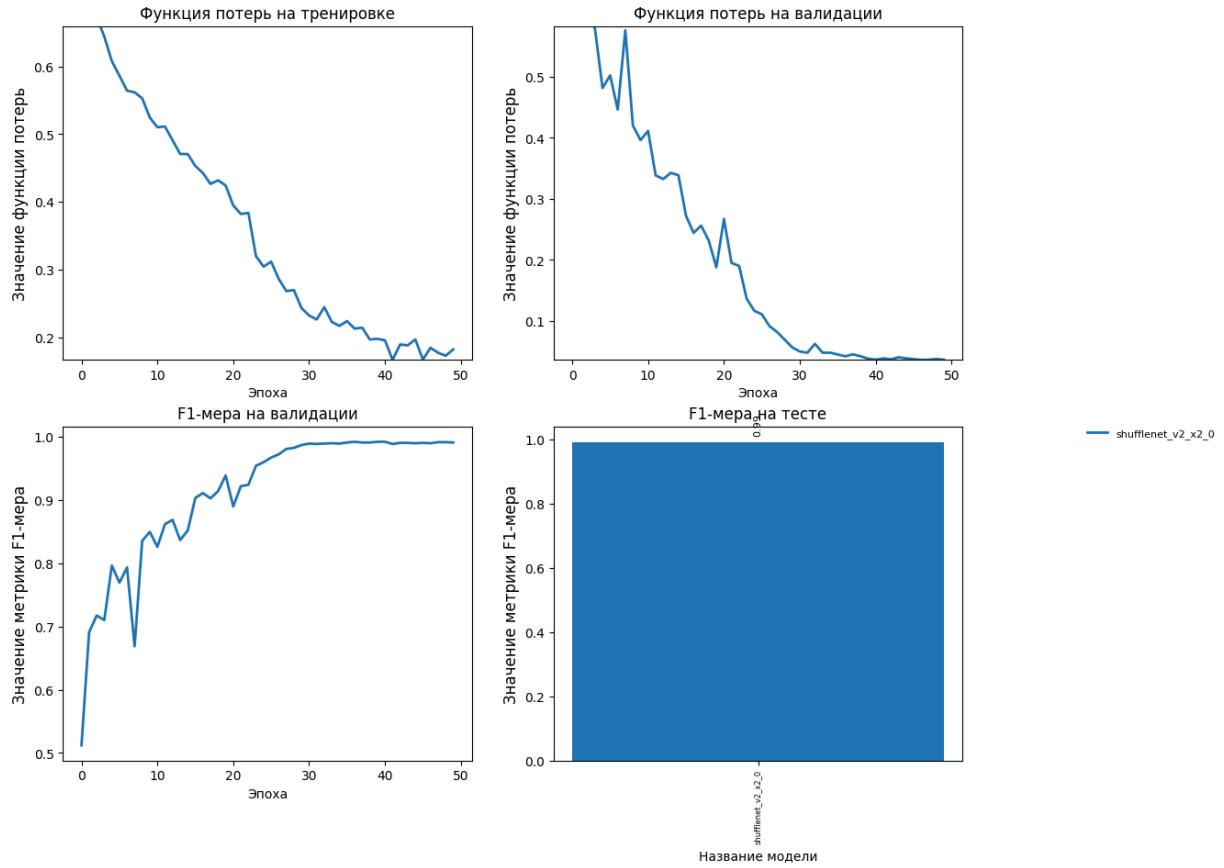
Epoch 45/50, Training Loss: 0.19679194560140065, Validation Loss: 0.0389557986850403  
Accuracy: 0.9892655367231639, Precision: 0.9892662436592164, Recall: 0.9892655367231  
639, F1-score: 0.9892655744146498

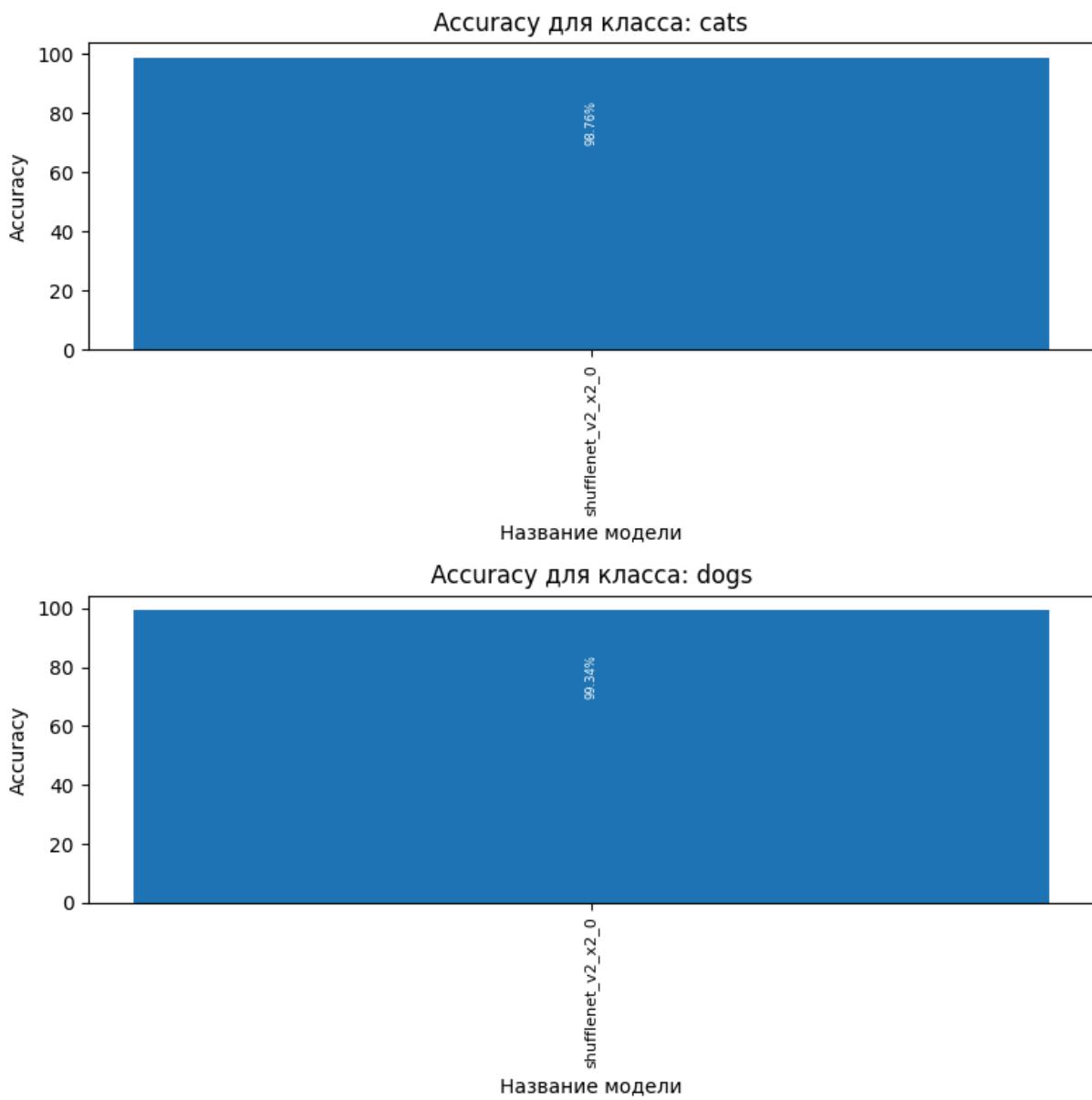
Epoch 46/50 (Train): 100% | 1  
17/117 [00:12<00:00, 9.67sample/s]

Epoch 46/50 (Eval): 100% |  
71/71 [00:03<00:00, 21.08sample/s]

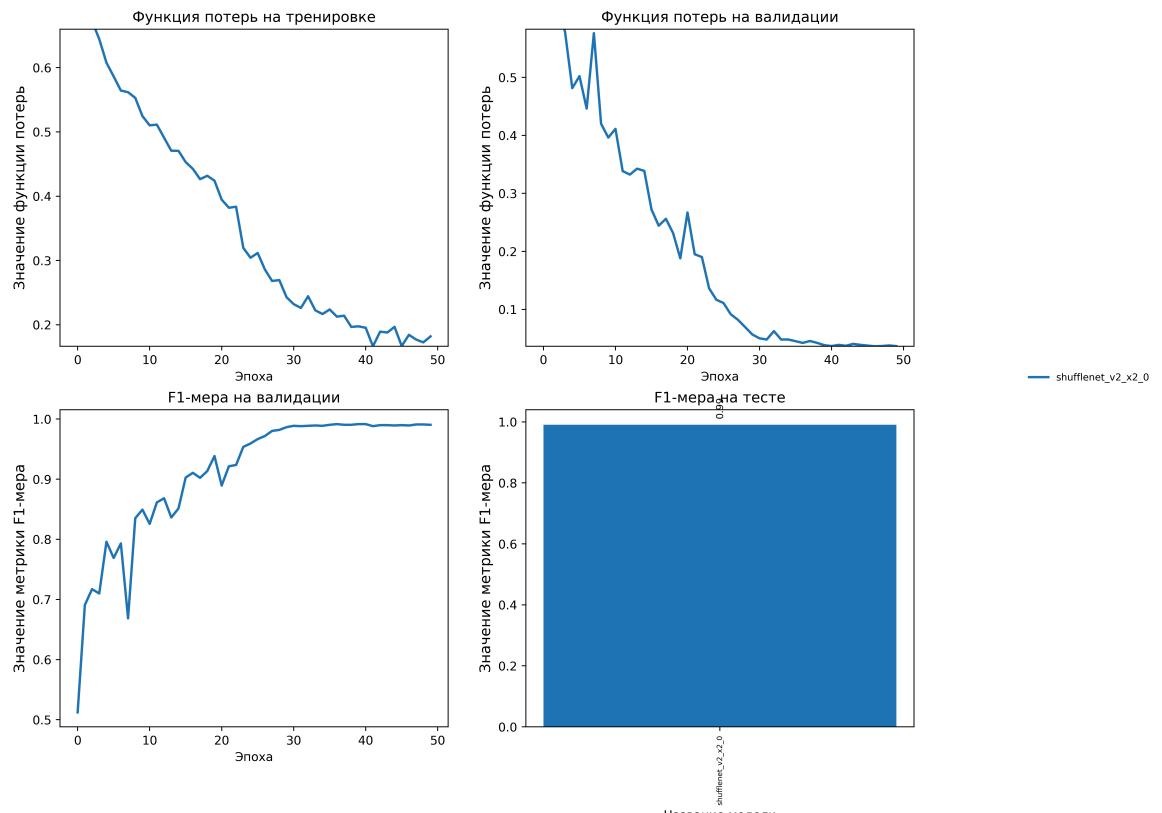
Epoch 46/50, Training Loss: 0.16694607937714898, Validation Loss: 0.0376816166493789  
1  
Accuracy: 0.9898305084745763, Precision: 0.9898305084745763, Recall: 0.9898305084745  
763, F1-score: 0.9898305084745763

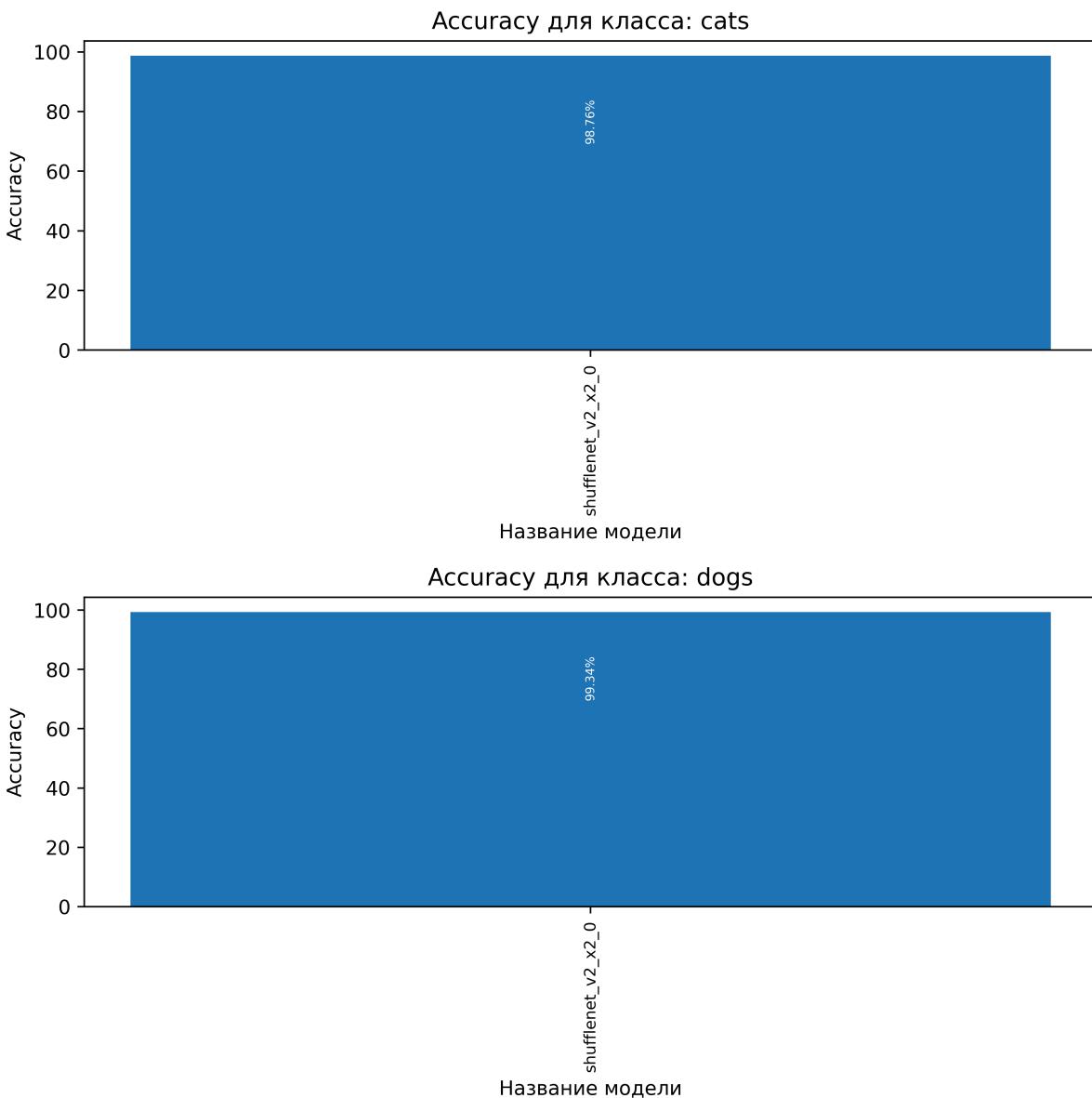
```
Epoch 47/50 (Train): 100%|██████████| 1  
17/117 [00:12<00:00, 9.74sample/s]  
Epoch 47/50 (Eval): 100%|██████████|  
71/71 [00:03<00:00, 20.18sample/s]  
Epoch 47/50, Training Loss: 0.18441219392306207, Validation Loss: 0.0364793107988270  
75  
Accuracy: 0.9892655367231639, Precision: 0.9892714056152313, Recall: 0.9892655367231  
639, F1-score: 0.9892656292374484  
  
Epoch 48/50 (Train): 100%|██████████| 1  
17/117 [00:12<00:00, 9.54sample/s]  
Epoch 48/50 (Eval): 100%|██████████|  
71/71 [00:03<00:00, 21.10sample/s]  
Epoch 48/50, Training Loss: 0.17704111945101692, Validation Loss: 0.0368815833047600  
6  
Accuracy: 0.9909604519774011, Precision: 0.9909630979076499, Recall: 0.9909604519774  
011, F1-score: 0.9909605096864667  
  
Epoch 49/50 (Train): 100%|██████████| 1  
17/117 [00:12<00:00, 9.73sample/s]  
Epoch 49/50 (Eval): 100%|██████████|  
71/71 [00:03<00:00, 20.91sample/s]  
Epoch 49/50, Training Loss: 0.17267212272970536, Validation Loss: 0.0379329555612688  
8  
Accuracy: 0.9909604519774011, Precision: 0.9909834338791536, Recall: 0.9909604519774  
011, F1-score: 0.9909605558515969  
  
Epoch 50/50 (Train): 100%|██████████| 1  
17/117 [00:12<00:00, 9.52sample/s]  
Epoch 50/50 (Eval): 100%|██████████|  
71/71 [00:03<00:00, 21.63sample/s]  
Epoch 00050: reducing learning rate of group 0 to 1.0000e-06.  
  
Epoch 50/50, Training Loss: 0.18198614929165832, Validation Loss: 0.0367316438758609  
Accuracy: 0.9903954802259887, Precision: 0.9904013361337817, Recall: 0.9903954802259  
887, F1-score: 0.9903955630019275  
Тренировка завершена!  
  
Test: 100%|██████████|  
72/72 [00:03<00:00, 18.49sample/s]  
Test Accuracy: 0.9905239687848384  
Precision: 0.9905388003040805, Recall: 0.9905239687848384, F1-score: 0.9905236890452  
531  
Accuracy of cats : 98 %  
Accuracy of dogs : 99 %
```





```
In [231]:  
ipd.display(ipd.Image(filename='./plot/PlotsMetrics_CatsVsDogs.png'))  
ipd.display(ipd.Image(filename='./plot/AccuracyForClass_CatsVsDogs.png'))
```





## Длительное обучение + лучший эксп + ImageNet

```
In [232...]: graduate_pipeline = validate_with_pydantic(EntryGraduateModel)(GraduateModelPipeline)
entry = {
    "prefix": "CatsVsDogs_ImageNet",
    "models": ["shufflenet_v2_x2_0"],
    "name_optimizers": ["AdamW"],
    "name_loss": "CrossEntropyLoss",
    "ratio": (70, 15, 15),
    "size_img": (64, 64),
    "batch_size": 25,
    "num_epochs": 50,
    "class_percentage": {"cats": 0.3, "dogs": 1.0},
    "is_use_class_weights": True,
    "is_use_imagenet_weights": True,
    "resampling_method": "undersampling"
```

```
    }  
)
```

```
In [233...]: graduate_pipeline.graduate()
```

```
Class_name: cats  
Train_count: 900  
Test_count: 300  
Valid_count: 300  
Shutil images: 100%|██████████| 150  
0/1500 [00:00<00:00, 1824.14image/s]  
Class_name: dogs  
Train_count: 900  
Test_count: 300  
Valid_count: 300  
Shutil images: 100%|██████████| 150  
0/1500 [00:00<00:00, 1858.90image/s]  
Downloading: "https://download.pytorch.org/models/shufflenetv2_x2_0-8be3c8ee.pth" to  
C:\Users\NightMare/.cache\torch\hub\checkpoints\shufflenetv2_x2_0-8be3c8ee.pth  
100%|██████████| 28.4M/28.4M [00:29<00:00, 1.01MB/s]
```

---

```
-----  
Выбранная модель: shufflenet_v2_x2_0  
Пользовательское название модели: shufflenet_v2_x2_0_CatsVsDogs_ImageNet  
Выбранный оптимизатор: AdamW
```

---

```
Epoch 1/50 (Train): 100%|██████████| 1  
17/117 [00:11<00:00, 9.79sample/s]  
Epoch 1/50 (Eval): 100%|██████████| 1  
71/71 [00:03<00:00, 21.24sample/s]  
Epoch 1/50, Training Loss: 0.5413268122476401, Validation Loss: 32.838974695000275  
Accuracy: 0.8864406779661017, Precision: 0.8864420413427745, Recall: 0.8864406779661  
017, F1-score: 0.8864410767023491  
Epoch 2/50 (Train): 100%|██████████| 1  
17/117 [00:12<00:00, 9.71sample/s]  
Epoch 2/50 (Eval): 100%|██████████| 1  
71/71 [00:03<00:00, 20.55sample/s]  
Epoch 2/50, Training Loss: 0.41914324744050857, Validation Loss: 11.47977851377537  
Accuracy: 0.9209039548022598, Precision: 0.9211509725788821, Recall: 0.9209039548022  
598, F1-score: 0.9208850631425942  
Epoch 3/50 (Train): 100%|██████████| 1  
17/117 [00:12<00:00, 9.63sample/s]  
Epoch 3/50 (Eval): 100%|██████████| 1  
71/71 [00:03<00:00, 21.75sample/s]  
Epoch 3/50, Training Loss: 0.39335030286582473, Validation Loss: 125.54689082757986  
Accuracy: 0.9288135593220339, Precision: 0.9288442441608382, Recall: 0.9288135593220  
339, F1-score: 0.9288099233027175
```

Epoch 4/50 (Train): 100% | 1  
17/117 [00:12<00:00, 9.67sample/s]  
Epoch 4/50 (Eval): 100% |  
71/71 [00:03<00:00, 21.13sample/s]

Epoch 4/50, Training Loss: 0.3328431937651536, Validation Loss: 132.3781032331688  
Accuracy: 0.9350282485875706, Precision: 0.9383813108903528, Recall: 0.9350282485875706, F1-score: 0.934924312059865

Epoch 5/50 (Train): 100% | 1  
17/117 [00:12<00:00, 9.73sample/s]  
Epoch 5/50 (Eval): 100% |  
71/71 [00:03<00:00, 21.19sample/s]

Epoch 00005: reducing learning rate of group 0 to 1.0000e-04.

Epoch 5/50, Training Loss: 0.29081624592702415, Validation Loss: 402.9700241266187  
Accuracy: 0.9429378531073447, Precision: 0.9434264713550712, Recall: 0.9429378531073447, F1-score: 0.9429288728546359

Epoch 6/50 (Train): 100% | 1  
17/117 [00:12<00:00, 9.70sample/s]  
Epoch 6/50 (Eval): 100% |  
71/71 [00:03<00:00, 20.97sample/s]

Epoch 6/50, Training Loss: 0.23490979701690248, Validation Loss: 2.755364345860178  
Accuracy: 0.9683615819209039, Precision: 0.9683721193137275, Recall: 0.9683615819209039, F1-score: 0.9683619050879572

Epoch 7/50 (Train): 100% | 1  
17/117 [00:12<00:00, 9.57sample/s]  
Epoch 7/50 (Eval): 100% |  
71/71 [00:03<00:00, 22.67sample/s]

Epoch 7/50, Training Loss: 0.21254457722824463, Validation Loss: 146.4148536800449  
Accuracy: 0.9689265536723164, Precision: 0.9697560163052155, Recall: 0.9689265536723164, F1-score: 0.9689173772948102

Epoch 8/50 (Train): 100% | 1  
17/117 [00:12<00:00, 9.69sample/s]  
Epoch 8/50 (Eval): 100% |  
71/71 [00:03<00:00, 21.42sample/s]

Epoch 8/50, Training Loss: 0.2036048859434644, Validation Loss: 1.283815372815503  
Accuracy: 0.9830508474576272, Precision: 0.9832530474638218, Recall: 0.9830508474576272, F1-score: 0.9830502631652754

Epoch 9/50 (Train): 100% | 1  
17/117 [00:11<00:00, 9.81sample/s]  
Epoch 9/50 (Eval): 100% |  
71/71 [00:03<00:00, 21.17sample/s]

Epoch 9/50, Training Loss: 0.17631416527163943, Validation Loss: 0.9142005697253165  
Accuracy: 0.984180790960452, Precision: 0.9842037728622043, Recall: 0.984180790960452, F1-score: 0.9841809727402948

Epoch 10/50 (Train): 100% | 1  
17/117 [00:12<00:00, 9.69sample/s]  
Epoch 10/50 (Eval): 100% |  
71/71 [00:03<00:00, 22.18sample/s]

Epoch 10/50, Training Loss: 0.16080402015769196, Validation Loss: 36.631412985920115  
Accuracy: 0.988135593220339, Precision: 0.9881667681449486, Recall: 0.988135593220339, F1-score: 0.9881357257676756

```
Epoch 11/50 (Train): 100%|██████████| 1  
17/117 [00:12<00:00, 9.57sample/s]  
Epoch 11/50 (Eval): 100%|██████████| 1  
71/71 [00:03<00:00, 21.45sample/s]  
Epoch 11/50, Training Loss: 0.15029634493387134, Validation Loss: 67.37501511975103  
Accuracy: 0.9915254237288136, Precision: 0.9916020757950866, Recall: 0.9915254237288136, F1-score: 0.9915254534841101  
Epoch 12/50 (Train): 100%|██████████| 1  
17/117 [00:11<00:00, 9.78sample/s]  
Epoch 12/50 (Eval): 100%|██████████| 1  
71/71 [00:03<00:00, 21.06sample/s]  
Epoch 00012: reducing learning rate of group 0 to 1.0000e-05.  
  
Epoch 12/50, Training Loss: 0.1494720005126241, Validation Loss: 75.78486831896441  
Accuracy: 0.988135593220339, Precision: 0.9883623579619736, Recall: 0.988135593220339, F1-score: 0.9881350895366011  
Epoch 13/50 (Train): 100%|██████████| 1  
17/117 [00:11<00:00, 9.76sample/s]  
Epoch 13/50 (Eval): 100%|██████████| 1  
71/71 [00:03<00:00, 21.23sample/s]  
Epoch 13/50, Training Loss: 0.13191737617042773, Validation Loss: 321.2123041644766  
Accuracy: 0.9830508474576272, Precision: 0.9834713583517325, Recall: 0.9830508474576272, F1-score: 0.9830488780754175  
Epoch 14/50 (Train): 100%|██████████| 1  
17/117 [00:12<00:00, 9.70sample/s]  
Epoch 14/50 (Eval): 100%|██████████| 1  
71/71 [00:03<00:00, 21.37sample/s]  
Epoch 14/50, Training Loss: 0.12032255050934262, Validation Loss: 52.16728793509899  
Accuracy: 0.9926553672316384, Precision: 0.9927320986478766, Recall: 0.9926553672316384, F1-score: 0.9926553930195622  
Epoch 15/50 (Train): 100%|██████████| 1  
17/117 [00:12<00:00, 9.62sample/s]  
Epoch 15/50 (Eval): 100%|██████████| 1  
71/71 [00:03<00:00, 21.32sample/s]  
Epoch 00015: reducing learning rate of group 0 to 1.0000e-06.  
  
Epoch 15/50, Training Loss: 0.1258909571019747, Validation Loss: 142.39642457498203  
Accuracy: 0.9892655367231639, Precision: 0.9894073380361504, Recall: 0.9892655367231639, F1-score: 0.9892653825362331  
Epoch 16/50 (Train): 100%|██████████| 1  
17/117 [00:11<00:00, 9.79sample/s]  
Epoch 16/50 (Eval): 100%|██████████| 1  
71/71 [00:03<00:00, 21.03sample/s]  
Epoch 16/50, Training Loss: 0.13036799524299467, Validation Loss: 5.035358533438158  
Accuracy: 0.9949152542372881, Precision: 0.9949158472161074, Recall: 0.9949152542372881, F1-score: 0.9949152331369463  
Epoch 17/50 (Train): 100%|██████████| 1  
17/117 [00:12<00:00, 9.60sample/s]  
Epoch 17/50 (Eval): 100%|██████████| 1  
71/71 [00:03<00:00, 21.18sample/s]  
Epoch 17/50, Training Loss: 0.12732825080361665, Validation Loss: 167.87276480807745  
Accuracy: 0.9898305084745763, Precision: 0.9899918784747115, Recall: 0.9898305084745763, F1-score: 0.9898303007275108
```

```
Epoch 18/50 (Train): 100%|██████████| 1  
17/117 [00:12<00:00, 9.60sample/s]  
Epoch 18/50 (Eval): 100%|██████████| 1  
71/71 [00:03<00:00, 20.70sample/s]  
Epoch 00018: reducing learning rate of group 0 to 1.0000e-07.  
  
Epoch 18/50, Training Loss: 0.12709392187316804, Validation Loss: 258.3670016626208  
Accuracy: 0.9830508474576272, Precision: 0.9833002050641628, Recall: 0.9830508474576  
272, F1-score: 0.9830499818315914  
  
Epoch 19/50 (Train): 100%|██████████| 1  
17/117 [00:11<00:00, 9.77sample/s]  
Epoch 19/50 (Eval): 100%|██████████| 1  
71/71 [00:03<00:00, 21.30sample/s]  
Epoch 19/50, Training Loss: 0.1248776963063839, Validation Loss: 77.34108023951553  
Accuracy: 0.9943502824858758, Precision: 0.9943732643876281, Recall: 0.9943502824858  
758, F1-score: 0.9943503474072483  
  
Epoch 20/50 (Train): 100%|██████████| 1  
17/117 [00:12<00:00, 9.65sample/s]  
Epoch 20/50 (Eval): 100%|██████████| 1  
71/71 [00:03<00:00, 21.77sample/s]  
Epoch 20/50, Training Loss: 0.1242376965697842, Validation Loss: 132.2097929998835  
Accuracy: 0.992090395480226, Precision: 0.9921538314415328, Recall: 0.99209039548022  
6, F1-score: 0.992090445974111  
  
Epoch 21/50 (Train): 100%|██████████| 1  
17/117 [00:12<00:00, 9.70sample/s]  
Epoch 21/50 (Eval): 100%|██████████| 1  
71/71 [00:03<00:00, 21.50sample/s]  
Epoch 00021: reducing learning rate of group 0 to 1.0000e-08.  
  
Epoch 21/50, Training Loss: 0.13032231549652376, Validation Loss: 273.6768925941107  
Accuracy: 0.9870056497175141, Precision: 0.9872320580401376, Recall: 0.9870056497175  
141, F1-score: 0.9870050980638965  
  
Epoch 22/50 (Train): 100%|██████████| 1  
17/117 [00:12<00:00, 9.55sample/s]  
Epoch 22/50 (Eval): 100%|██████████| 1  
71/71 [00:03<00:00, 21.46sample/s]  
Epoch 22/50, Training Loss: 0.13033991053546826, Validation Loss: 134.62355402510977  
Accuracy: 0.9909604519774011, Precision: 0.9910515527877322, Recall: 0.9909604519774  
011, F1-score: 0.9909604519774011  
  
Epoch 23/50 (Train): 100%|██████████| 1  
17/117 [00:12<00:00, 9.61sample/s]  
Epoch 23/50 (Eval): 100%|██████████| 1  
71/71 [00:03<00:00, 21.19sample/s]  
Epoch 23/50, Training Loss: 0.11400998781252768, Validation Loss: 102.59460811793744  
Accuracy: 0.9915254237288136, Precision: 0.9916323330487612, Recall: 0.9915254237288  
136, F1-score: 0.991525388563463  
  
Epoch 24/50 (Train): 100%|██████████| 1  
17/117 [00:12<00:00, 9.69sample/s]  
Epoch 24/50 (Eval): 100%|██████████| 1  
71/71 [00:03<00:00, 21.19sample/s]  
Epoch 24/50, Training Loss: 0.13334901112730252, Validation Loss: 176.19630263691982  
Accuracy: 0.988135593220339, Precision: 0.9883623579619736, Recall: 0.98813559322033  
9, F1-score: 0.9881350895366011
```

```
Epoch 25/50 (Train): 100%|██████████| 1  
17/117 [00:12<00:00, 9.69sample/s]  
Epoch 25/50 (Eval): 100%|██████████|  
71/71 [00:03<00:00, 21.16sample/s]  
Epoch 25/50, Training Loss: 0.1358794126166767, Validation Loss: 167.68696446308346  
Accuracy: 0.9875706214689266, Precision: 0.9876338265966239, Recall: 0.9875706214689  
266, F1-score: 0.9875707008164601  
Epoch 26/50 (Train): 100%|██████████| 1  
17/117 [00:12<00:00, 9.52sample/s]  
Epoch 26/50 (Eval): 100%|██████████|  
71/71 [00:03<00:00, 21.90sample/s]  
Epoch 26/50, Training Loss: 0.13957189719266294, Validation Loss: 29.07876447829126  
Accuracy: 0.9943502824858758, Precision: 0.9943528937910829, Recall: 0.9943502824858  
758, F1-score: 0.9943503185540417  
Epoch 27/50 (Train): 100%|██████████| 1  
17/117 [00:12<00:00, 9.59sample/s]  
Epoch 27/50 (Eval): 100%|██████████|  
71/71 [00:03<00:00, 21.03sample/s]  
Epoch 27/50, Training Loss: 0.12206210483096003, Validation Loss: 14.359795202961518  
Accuracy: 0.996045197740113, Precision: 0.9960509887265335, Recall: 0.99604519774011  
3, F1-score: 0.996045231824323  
Epoch 28/50 (Train): 100%|██████████| 1  
17/117 [00:11<00:00, 9.78sample/s]  
Epoch 28/50 (Eval): 100%|██████████|  
71/71 [00:03<00:00, 21.14sample/s]  
Epoch 28/50, Training Loss: 0.10613247233081315, Validation Loss: 94.66143805017079  
Accuracy: 0.9875706214689266, Precision: 0.9876939778536349, Recall: 0.9875706214689  
266, F1-score: 0.9875705103823795  
Epoch 29/50 (Train): 100%|██████████| 1  
17/117 [00:11<00:00, 9.97sample/s]  
Epoch 29/50 (Eval): 100%|██████████|  
71/71 [00:03<00:00, 21.19sample/s]  
Epoch 29/50, Training Loss: 0.12640043030912215, Validation Loss: 223.8925245076143  
Accuracy: 0.9870056497175141, Precision: 0.9872320580401376, Recall: 0.9870056497175  
141, F1-score: 0.9870050980638965  
Epoch 30/50 (Train): 100%|██████████| 1  
17/117 [00:12<00:00, 9.60sample/s]  
Epoch 30/50 (Eval): 100%|██████████|  
71/71 [00:03<00:00, 21.09sample/s]  
Epoch 30/50, Training Loss: 0.1332487489330451, Validation Loss: 264.1858929315204  
Accuracy: 0.9864406779661017, Precision: 0.9866438130012266, Recall: 0.9864406779661  
017, F1-score: 0.9864402105322203  
Epoch 31/50 (Train): 100%|██████████| 1  
17/117 [00:11<00:00, 9.97sample/s]  
Epoch 31/50 (Eval): 100%|██████████|  
71/71 [00:03<00:00, 21.27sample/s]  
Epoch 31/50, Training Loss: 0.11212697867112062, Validation Loss: 128.18044290429185  
Accuracy: 0.9870056497175141, Precision: 0.987147061466454, Recall: 0.98700564971751  
41, F1-score: 0.987005463070177  
Epoch 32/50 (Train): 100%|██████████| 1  
17/117 [00:11<00:00, 9.92sample/s]  
Epoch 32/50 (Eval): 100%|██████████|  
71/71 [00:03<00:00, 21.42sample/s]
```

Epoch 32/50, Training Loss: 0.13048698260253647, Validation Loss: 78.05065717524388  
Accuracy: 0.9898305084745763, Precision: 0.9899541880461448, Recall: 0.9898305084745763, F1-score: 0.9898304175855834

Epoch 33/50 (Train): 100% | ██████████ | 1  
17/117 [00:11<00:00, 9.78sample/s]

Epoch 33/50 (Eval): 100% | ██████████ |  
71/71 [00:03<00:00, 21.39sample/s]

Epoch 33/50, Training Loss: 0.12896970036372388, Validation Loss: 147.0964329586625  
Accuracy: 0.9898305084745763, Precision: 0.9899541880461448, Recall: 0.9898305084745763, F1-score: 0.9898304175855834

Epoch 34/50 (Train): 100% | ██████████ | 1  
17/117 [00:12<00:00, 9.54sample/s]

Epoch 34/50 (Eval): 100% | ██████████ |  
71/71 [00:03<00:00, 20.92sample/s]

Epoch 34/50, Training Loss: 0.12885002365265413, Validation Loss: 118.3351218352452  
Accuracy: 0.9909604519774011, Precision: 0.9910515527877322, Recall: 0.9909604519774011, F1-score: 0.9909604519774011

Epoch 35/50 (Train): 100% | ██████████ | 1  
17/117 [00:12<00:00, 9.63sample/s]

Epoch 35/50 (Eval): 100% | ██████████ |  
71/71 [00:03<00:00, 21.16sample/s]

Epoch 35/50, Training Loss: 0.11659130085694933, Validation Loss: 72.41623691440162  
Accuracy: 0.9898305084745763, Precision: 0.9898711576503971, Recall: 0.9898305084745763, F1-score: 0.989830612348109

Epoch 36/50 (Train): 100% | ██████████ | 1  
17/117 [00:11<00:00, 9.79sample/s]

Epoch 36/50 (Eval): 100% | ██████████ |  
71/71 [00:03<00:00, 21.12sample/s]

Epoch 36/50, Training Loss: 0.12603373195227122, Validation Loss: 607.8873906751054  
Accuracy: 0.9864406779661017, Precision: 0.9866912477276694, Recall: 0.9864406779661017, F1-score: 0.9864399854652732

Epoch 37/50 (Train): 100% | ██████████ | 1  
17/117 [00:12<00:00, 9.69sample/s]

Epoch 37/50 (Eval): 100% | ██████████ |  
71/71 [00:03<00:00, 21.58sample/s]

Epoch 37/50, Training Loss: 0.12331066151786454, Validation Loss: 68.82179846521795  
Accuracy: 0.992090395480226, Precision: 0.9921816001683339, Recall: 0.992090395480226, F1-score: 0.992090395480226

Epoch 38/50 (Train): 100% | ██████████ | 1  
17/117 [00:11<00:00, 9.92sample/s]

Epoch 38/50 (Eval): 100% | ██████████ |  
71/71 [00:03<00:00, 21.15sample/s]

Epoch 38/50, Training Loss: 0.1123852672573832, Validation Loss: 45.476261484116385  
Accuracy: 0.9954802259887006, Precision: 0.9954904863854367, Recall: 0.9954802259887006, F1-score: 0.9954802721554223

Epoch 39/50 (Train): 100% | ██████████ | 1  
17/117 [00:12<00:00, 9.70sample/s]

Epoch 39/50 (Eval): 100% | ██████████ |  
71/71 [00:03<00:00, 21.83sample/s]

Epoch 39/50, Training Loss: 0.12428960981826807, Validation Loss: 133.88812760096295  
Accuracy: 0.992090395480226, Precision: 0.9921538314415328, Recall: 0.992090395480226, F1-score: 0.992090445974111

Epoch 40/50 (Train): 100% | 1  
17/117 [00:11<00:00, 9.86sample/s]  
Epoch 40/50 (Eval): 100% |  
71/71 [00:03<00:00, 21.30sample/s]  
Epoch 40/50, Training Loss: 0.10778541267686284, Validation Loss: 266.5457103374989  
Accuracy: 0.9853107344632769, Precision: 0.9855135578220916, Recall: 0.9853107344632769, F1-score: 0.985310228076572

Epoch 41/50 (Train): 100% | 1  
17/117 [00:11<00:00, 9.89sample/s]  
Epoch 41/50 (Eval): 100% |  
71/71 [00:03<00:00, 19.99sample/s]  
Epoch 41/50, Training Loss: 0.12200869055932126, Validation Loss: 342.12373095120586  
Accuracy: 0.9864406779661017, Precision: 0.9867436620161012, Recall: 0.9864406779661017, F1-score: 0.9864397257665207

Epoch 42/50 (Train): 100% | 1  
17/117 [00:12<00:00, 9.72sample/s]  
Epoch 42/50 (Eval): 100% |  
71/71 [00:03<00:00, 20.93sample/s]  
Epoch 42/50, Training Loss: 0.1182793020894847, Validation Loss: 775.0403467209603  
Accuracy: 0.9858757062146892, Precision: 0.9861017581183015, Recall: 0.9858757062146892, F1-score: 0.9858751065911919

Epoch 43/50 (Train): 100% | 1  
17/117 [00:11<00:00, 9.85sample/s]  
Epoch 43/50 (Eval): 100% |  
71/71 [00:03<00:00, 21.36sample/s]  
Epoch 43/50, Training Loss: 0.12402496098051059, Validation Loss: 22.076023550412753  
Accuracy: 0.9949152542372881, Precision: 0.9949312463720144, Recall: 0.9949152542372881, F1-score: 0.9949153110437248

Epoch 44/50 (Train): 100% | 1  
17/117 [00:11<00:00, 9.85sample/s]  
Epoch 44/50 (Eval): 100% |  
71/71 [00:03<00:00, 21.19sample/s]  
Epoch 44/50, Training Loss: 0.12894496645080725, Validation Loss: 54.229369022357965  
Accuracy: 0.9949152542372881, Precision: 0.9949312463720144, Recall: 0.9949152542372881, F1-score: 0.9949153110437248

Epoch 45/50 (Train): 100% | 1  
17/117 [00:11<00:00, 9.79sample/s]  
Epoch 45/50 (Eval): 100% |  
71/71 [00:03<00:00, 21.24sample/s]  
Epoch 45/50, Training Loss: 0.12392683304154996, Validation Loss: 76.89841898117349  
Accuracy: 0.9892655367231639, Precision: 0.9893721834588168, Recall: 0.9892655367231639, F1-score: 0.9892654921803864

Epoch 46/50 (Train): 100% | 1  
17/117 [00:12<00:00, 9.73sample/s]  
Epoch 46/50 (Eval): 100% |  
71/71 [00:03<00:00, 21.15sample/s]  
Epoch 46/50, Training Loss: 0.11717545181269601, Validation Loss: 238.27568153051612  
Accuracy: 0.9903954802259887, Precision: 0.9905374763209985, Recall: 0.9903954802259887, F1-score: 0.9903953422692612

Epoch 47/50 (Train): 100% | 1  
17/117 [00:11<00:00, 9.89sample/s]  
Epoch 47/50 (Eval): 100% |  
71/71 [00:03<00:00, 21.18sample/s]

Epoch 47/50, Training Loss: 0.12269279430860404, Validation Loss: 18.757362701667677  
Accuracy: 0.996045197740113, Precision: 0.9960611826614271, Recall: 0.996045197740111  
3, F1-score: 0.996045241922897

Epoch 48/50 (Train): 100% | ██████████ | 1  
17/117 [00:11<00:00, 9.95sample/s]  
Epoch 48/50 (Eval): 100% | ██████████ |  
71/71 [00:03<00:00, 20.84sample/s]

Epoch 48/50, Training Loss: 0.12018361907529156, Validation Loss: 119.66408112964272  
Accuracy: 0.9932203389830508, Precision: 0.9932838326527602, Recall: 0.9932203389830  
508, F1-score: 0.9932203822635237

Epoch 49/50 (Train): 100% | ██████████ | 1  
17/117 [00:12<00:00, 9.57sample/s]  
Epoch 49/50 (Eval): 100% | ██████████ |  
71/71 [00:03<00:00, 21.84sample/s]

Epoch 49/50, Training Loss: 0.12037443300817943, Validation Loss: 100.71088438627828  
Accuracy: 0.9898305084745763, Precision: 0.9899541880461448, Recall: 0.9898305084745  
763, F1-score: 0.9898304175855834

Epoch 50/50 (Train): 100% | ██████████ | 1  
17/117 [00:11<00:00, 9.93sample/s]  
Epoch 50/50 (Eval): 100% | ██████████ |  
71/71 [00:03<00:00, 21.37sample/s]

Epoch 50/50, Training Loss: 0.12322621908410103, Validation Loss: 70.46996356356208  
Accuracy: 0.9887005649717514, Precision: 0.9888617041135175, Recall: 0.9887005649717  
514, F1-score: 0.9887003341416786

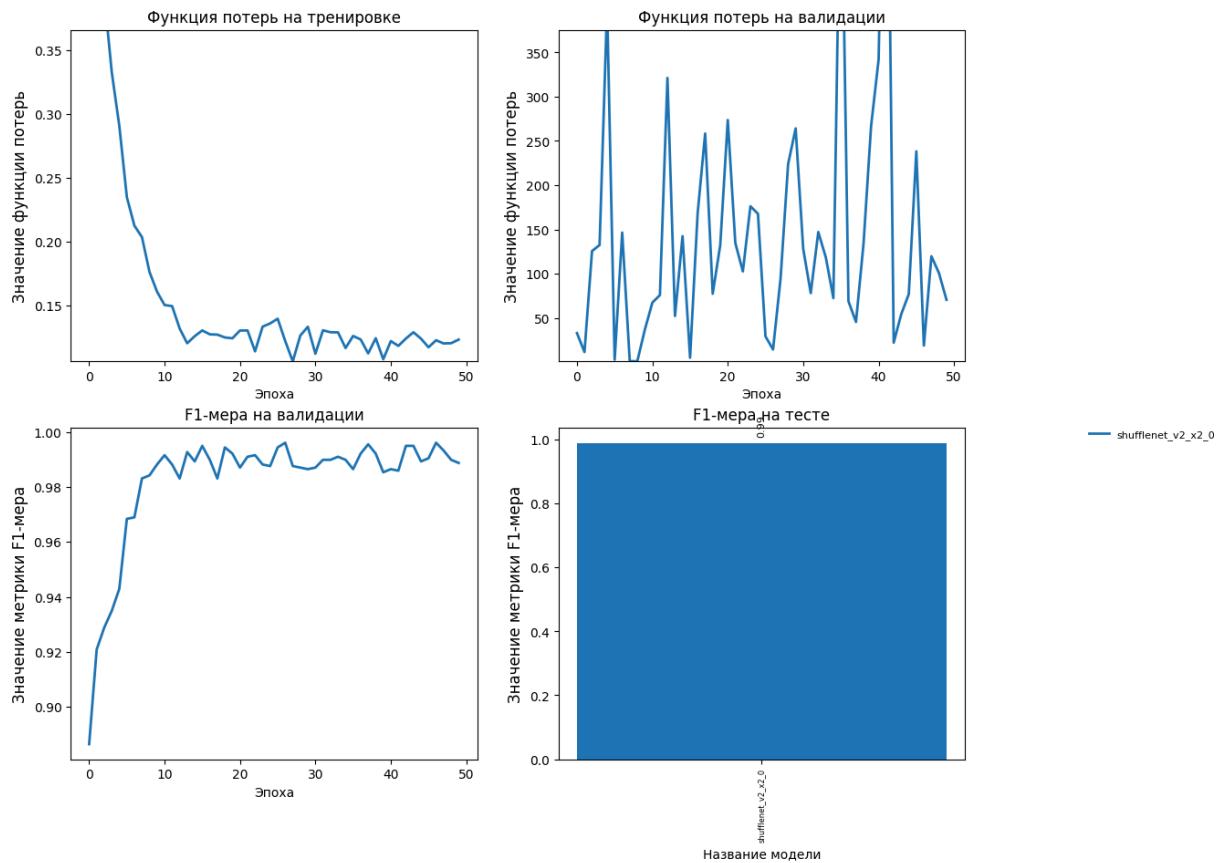
Тренировка завершена!

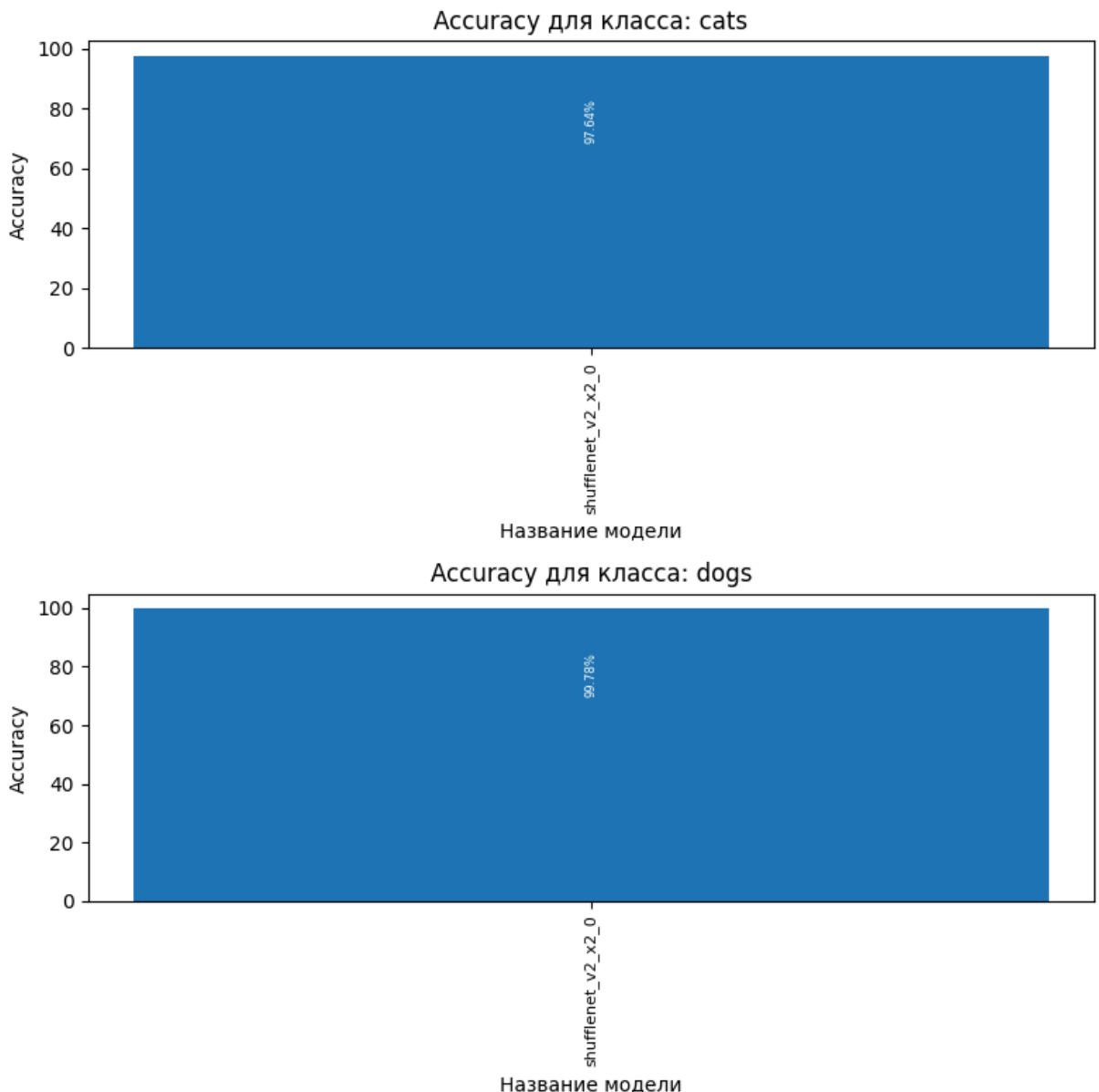
Test: 100% | ██████████ |  
72/72 [00:03<00:00, 18.66sample/s]

Test Accuracy: 0.9871794871794872  
Precision: 0.9873961304403891, Recall: 0.9871794871794872, F1-score: 0.9871769887043  
341

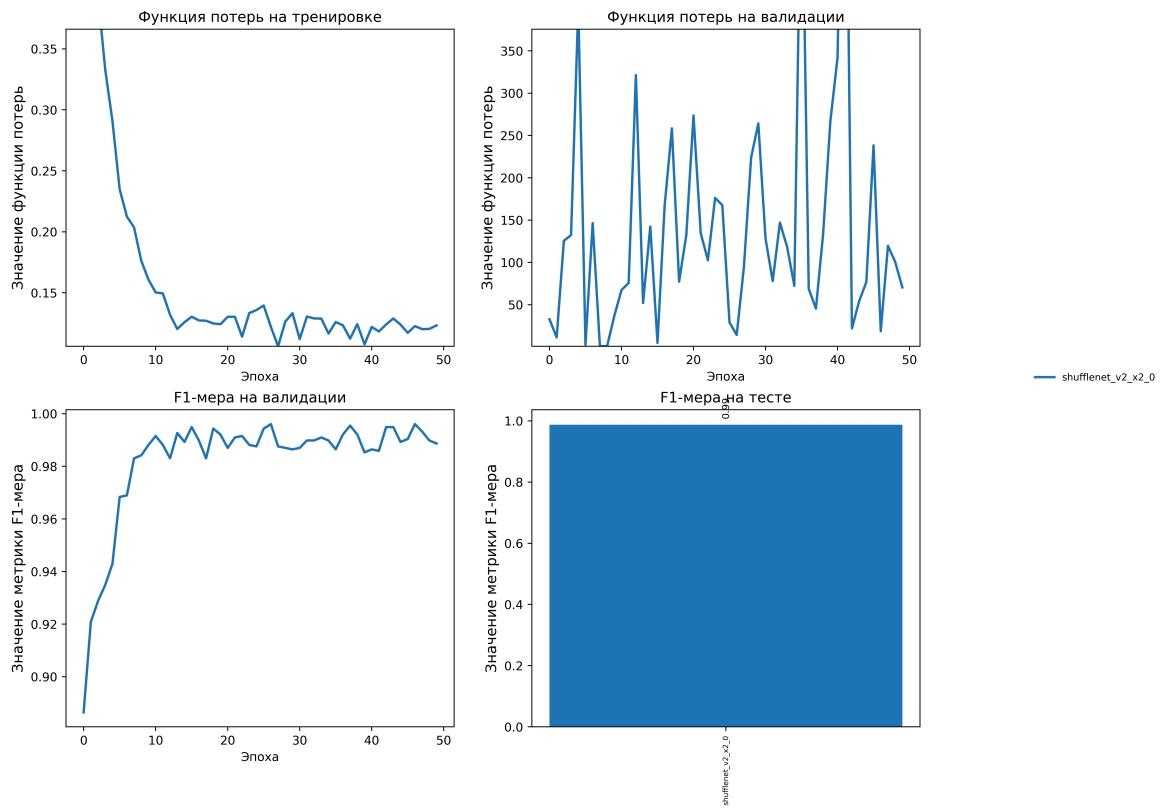
Accuracy of cats : 97 %

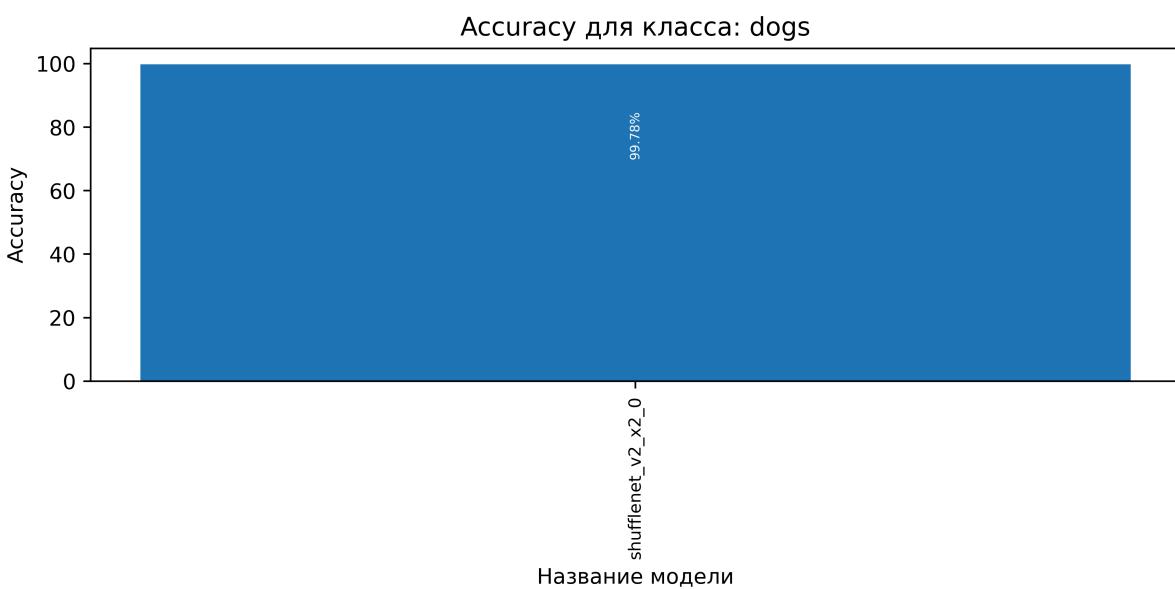
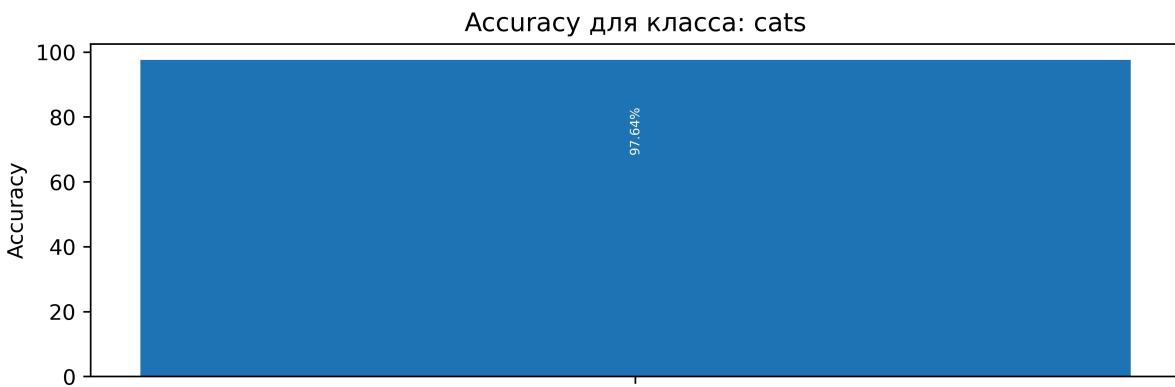
Accuracy of dogs : 99 %





```
In [234...]:  
    ipd.display(ipd.Image(filename='./plot/PlotsMetrics_CatsVsDogs_ImageNet.png'))  
    ipd.display(ipd.Image(filename='./plot/AccuracyForClass_CatsVsDogs_ImageNet.png'))
```





## Инференс

### shufflenet\_v2\_x2\_0

```
In [239...]:  


```
imgs = [f"./images/{file}" for file in os.listdir("./images")]
print(imgs)

inference_pipeline = validate_with_pydantic(EntryInferenceModel)(InferenceModelPipe
    entry = {
        "prefix": "CatsVsDogs",
        "name_model": "shufflenet_v2_x2_0",
        "image_path_list": imgs,
        "classes": ["cat", "dog"],
        "ground_truth": [0, 0, 0, 0, 0, 1, 1, 1, 1, 1],
        "size_img": (64, 64)
```


```

```
    }  
)
```

```
['./images/cat.jpg', './images/cat1.jpg', './images/cat2.jpg', './images/cat3.jpg',  
'./images/cat4.jpg', './images/cat4.png', './images/dog.png', './images/dog1.jpg',  
'./images/dog2.jpg', './images/dog3.jpg', './images/dog4.jpg']
```

```
In [240]: inference_pipeline.inference()
```

```
17:43:51-470640 INFO      Модель инициализирована
```

```
17:43:51-716303 INFO      Модель shufflenet_v2_x2_0 успешно загружена с весами
```

```
Classifying:  0%|  
| 0/11 [00:00<?, ?image/s]
```

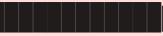
Predicted: cat



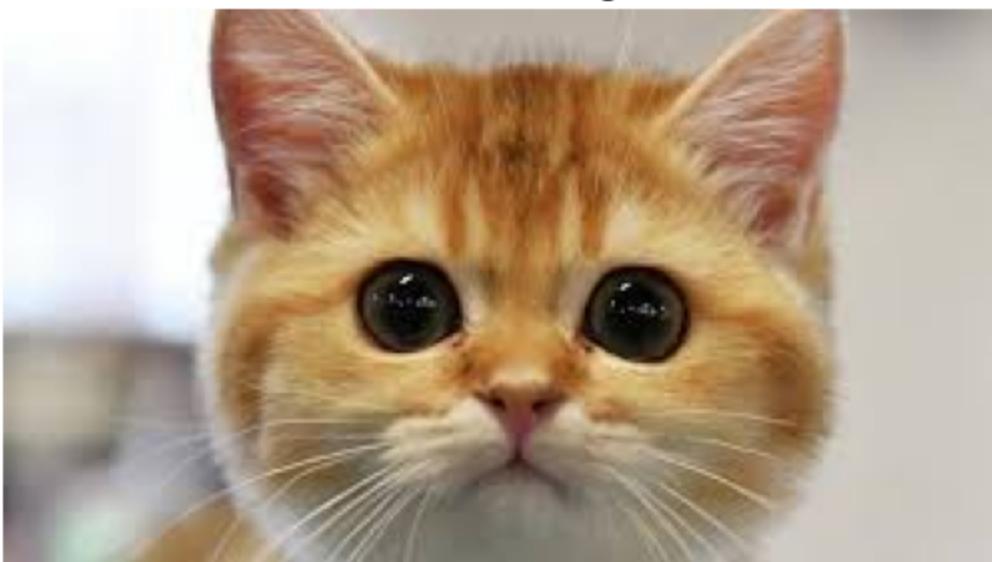
```
Classifying:  9%|██████  
| 1/11 [00:00<00:03, 3.07image/s]
```

Predicted: dog



Classifying: 18% |  | 2/11 [00:00<00:02, 3.81image/s]

Predicted: dog



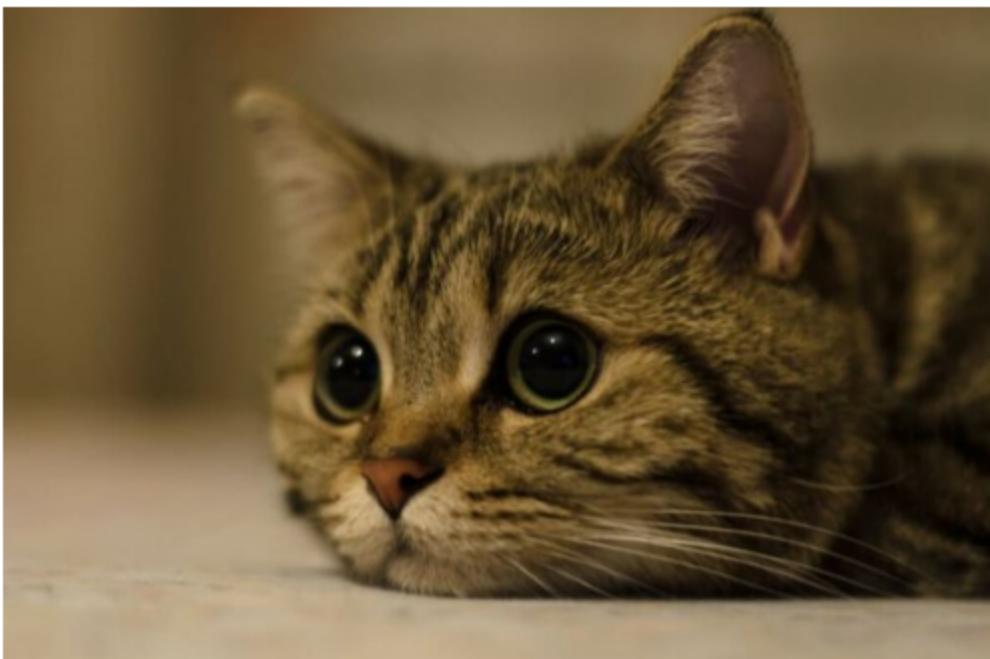
Classifying: 27% |  | 3/11 [00:00<00:01, 4.44image/s]

Predicted: dog



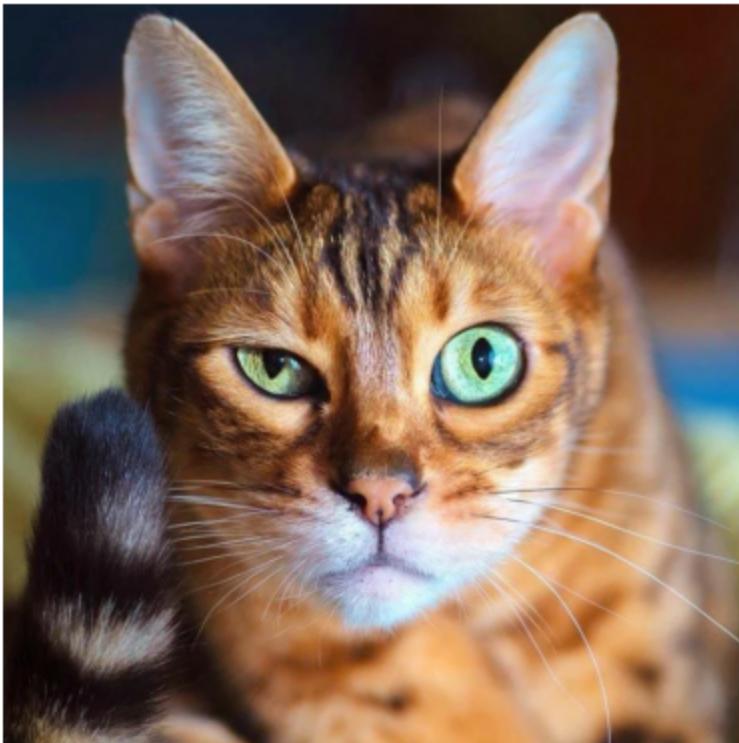
Classifying: 36% | | 4/11 [00:00<00:01, 4.84image/s]

Predicted: cat



Classifying: 45% | | 5/11 [00:01<00:01, 4.67image/s]

Predicted: cat



Classifying: 55% |  | 6/11 [00:01<00:01, 3.94image/s]

Predicted: dog



Classifying: 64% |  | 7/11 [00:01<00:01, 3.61image/s]

Predicted: dog



Classifying: 73% | 8/11 [00:02<00:00, 3.72image/s]

Predicted: dog



Classifying: 82% | 9/11 [00:02<00:00, 4.24image/s]

Predicted: cat



Classifying: 91% | [██████████] 10/11 [00:02<00:00, 3.85image/s]

Predicted: dog



Classifying: 100% | [██████████] 11/11 [00:02<00:00, 3.97image/s]  
predictions: [0, 1, 1, 1, 0, 0, 1, 1, 1, 0, 1]

```
17:43:54-489952 INFO      Predictions: [0, 1, 1, 1, 0, 0, 1, 1, 1, 0, 1]
Precision: 0.538961038961039, Recall: 0.5454545454545454, F1-score: 0.53768453768453
77
17:43:54-496028 INFO      Precision: 0.538961038961039, Recall: 0.54545454545454

Out[240... (
    [0, 1, 1, 1, 0, 0, 1, 1, 1, 0, 1],
    [
        ('./images/cat.jpg', 0),
        ('./images/cat1.jpg', 1),
        ('./images/cat2.jpg', 1),
        ('./images/cat3.jpg', 1),
        ('./images/cat4.jpg', 0),
        ('./images/cat4.png', 0),
        ('./images/dog.png', 1),
        ('./images/dog1.jpg', 1),
        ('./images/dog2.jpg', 1),
        ('./images/dog3.jpg', 0),
        ('./images/dog4.jpg', 1)
    ]
)
```

## shufflenet\_v2\_x2\_0 + ImageNet

```
In [241... imgs = [f"./images/{file}" for file in os.listdir("./images")]
print(imgs)

inference_pipeline = validate_with_pydantic(EntryInferenceModel)(InferenceModelPipe
entry = {
    "prefix": "CatsVsDogs_ImageNet",
    "name_model": "shufflenet_v2_x2_0",
    "image_path_list": imgs,
    "classes": ["cat", "dog"],
    "ground_truth": [0, 0, 0, 0, 0, 1, 1, 1, 1, 1],
    "size_img": (64, 64)
}
)

['./images/cat.jpg', './images/cat1.jpg', './images/cat2.jpg', './images/cat3.jpg',
'./images/cat4.jpg', './images/cat4.png', './images/dog.png', './images/dog1.jpg',
'./images/dog2.jpg', './images/dog3.jpg', './images/dog4.jpg']
```

```
In [242... inference_pipeline.inference()
```

```
17:44:03-568895 INFO      Модель инициализирована
17:44:03-700660 INFO      Модель shufflenet_v2_x2_0 успешно загружена с весами

Classifying:  0%|
| 0/11 [00:00<?, ?image/s]
```

Predicted: cat



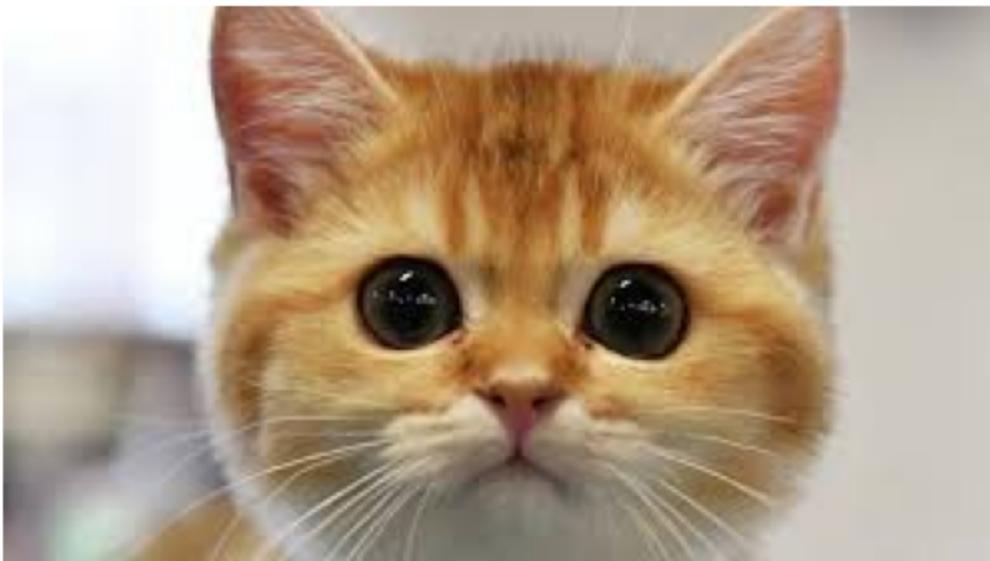
Classifying: 9% |  | 1/11 [00:00<00:03, 3.25image/s]

Predicted: cat



Classifying: 18% |  | 2/11 [00:00<00:02, 4.30image/s]

Predicted: cat



Classifying: 27% |   
| 3/11 [00:00<00:01, 5.19image/s]

Predicted: dog



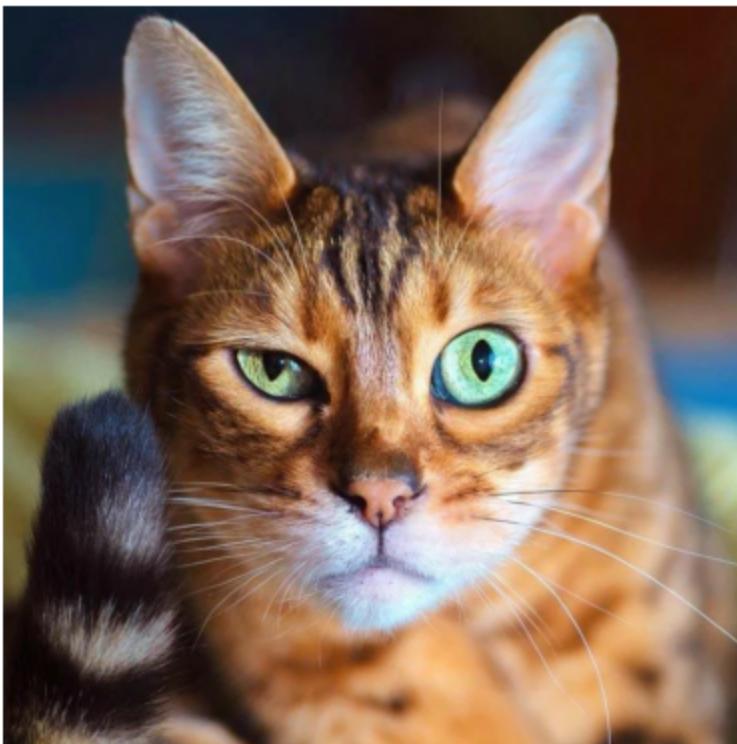
Classifying: 36% |   
| 4/11 [00:00<00:01, 5.56image/s]

Predicted: cat



Classifying: 45% |  |  
| 5/11 [00:00<00:01, 5.62image/s]

Predicted: cat



Classifying: 55% |  |  
| 6/11 [00:01<00:01, 4.68image/s]

Predicted: dog



Classifying: 64% | | 7/11 [00:01<00:00, 4.14image/s]

Predicted: dog



Classifying: 73% | | 8/11 [00:01<00:00, 4.17image/s]

Predicted: dog



Classifying: 82% |  | 9/11 [00:01<00:00, 4.70image/s]

Predicted: dog



Classifying: 91% |  | 10/11 [00:02<00:00, 4.16image/s]

Predicted: dog



```
Classifying: 100%|██████████
| 11/11 [00:02<00:00,  4.41image/s]
predictions: [0, 0, 0, 1, 0, 0, 1, 1, 1, 1, 1]
17:44:06-198140 INFO Predictions: [0, 0, 0, 1, 0, 0, 1, 1, 1, 1, 1]
Precision: 0.8181818181818182, Recall: 0.8181818181818182, F1-score: 0.8181818181818182
17:44:06-204141 INFO Precision: 0.81818181818182, Recall: 0.818181818182
```

```
Out[242... (
    [0, 0, 0, 1, 0, 0, 1, 1, 1, 1, 1],
    [
        ('./images/cat.jpg', 0),
        ('./images/cat1.jpg', 0),
        ('./images/cat2.jpg', 0),
        ('./images/cat3.jpg', 1),
        ('./images/cat4.jpg', 0),
        ('./images/cat4.png', 0),
        ('./images/dog.png', 1),
        ('./images/dog1.jpg', 1),
        ('./images/dog2.jpg', 1),
        ('./images/dog3.jpg', 1),
        ('./images/dog4.jpg', 1)
    ]
)
```

## Выходы

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1. Лучший подход (Exp2) к решению дисбаланса классов оказался не очевидным, лучше экспериментировать.  
Какой подход выстрелит, думаю, зависит от набора данных.
  2. Трансфер обучения (ImageNet) естественным образом работает лучше, выше обобщающая способность,  
исходя из результатов инференса. + обучать меньше по времени, модель быстрее сходится.
-