

DLH598-Team144 (/github/benpcorn/DLH598-Team144/tree/main)

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DL4H\_Team\_144\_BCORN2.ipynb (/github/benpcorn/DLH598-Team144/tree/main/DL4H\_Team\_144\_BCORN2.ipynb)

 [Open in Colab](https://colab.research.google.com/github/benpcorn/DLH598-Team144/blob/main/DL4H_Team_144_BCORN2.ipynb) ([https://colab.research.google.com/github/benpcorn/DLH598-Team144/blob/main/DL4H\\_Team\\_144\\_BCORN2.ipynb](https://colab.research.google.com/github/benpcorn/DLH598-Team144/blob/main/DL4H_Team_144_BCORN2.ipynb))

## Introduction

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Github Repo for Project: <https://github.com/benpcorn/DLH598-Team144>  
(<https://github.com/benpcorn/DLH598-Team144>)

Video Presentation: <https://www.youtube.com/watch?v=mZLC0L0FTKQ>  
(<https://www.youtube.com/watch?v=mZLC0L0FTKQ>)

Paper Repo: <https://github.com/tufts-ml/SAMIL/tree/main> (<https://github.com/tufts-ml/SAMIL/tree/main>)

Paper PDF: <https://arxiv.org/pdf/2306.00003.pdf> (<https://arxiv.org/pdf/2306.00003.pdf>)

## Problem

Huang, Zhe, Wessler, Benjamin S., and Hughes, Michael C. (2023) – Detecting Heart Disease from Multi-View Ultrasound Images via Supervised Attention Multiple Instance Learning describes the clinical problem of under-diagnosis and under-treatment of aortic stenosis (AS), a degenerative valve condition. In clinical practice, AS is diagnosed by manual expert view of a transthoracic echocardiography (TTE) – which uses ultrasound to produce many images of the heart. AS can be treated effectively, but requires identification early on. If left untreated, "severe AS has lower 5-year survival rates than several metastatic cancers" (Huang et al., 2021). When treated, AS has a low mortality rate, but up to 2/3 of symptomatic AS patients go undiagnosed (Huang et al., 2021). Automatic screening of AS from transthoracic echocardiography imagery can improve the rate of detection and decrease mortality.

## Paper Explanation

The challenge with automatic detection is each TTE "consists of dozens of images or videos (typically 27-97 in our data) that show the heart's complex anatomy from different acquisition angles" (Huang, Wessler, and Hughes, 2023) where a clinical expert identifies imagery where the aortic valve is clearly visible, then assesses the severity on a 3-level scale (no, early, significant disease). Traditional Deep Learning approaches classify a single image with a single result,

however the clinical expert review makes a single "coherent prediction" (Huang, Wessler, and Hughes, 2023) from knowledge gathered from the set of images. Additionally, the image views produced by a TTE are often unlabeled in Electronic Health Records, further complicating any Deep Learning approaches.

The paper finds previous approaches to automatic detection such as attention-based multiple instance learning (MIL) to be insufficient based on accuracy and detection yield, and explores a novel MIL approach to improve the detection of AS from automatic detection that mimics the methodology of a clinical expert.

The paper outlines two novel contributions to automatic AS detection:

1. Supervised attention mechanism that identifies relevant TTE views (often unlabeled), mimicking human filtering done by a clinical expert. This is accomplished by introducing a new loss term, "supervised attention (SA)", to match attention weights to the relevance scores from a View Relevance classifier.
2. Self-supervised pretraining strategy through contrastive learning on the embedding of the entire TTE study (i.e., a "bag of images") – compared to traditional pretraining strategies which focus on individual images.

## Paper Results

The paper uses *balanced accuracy* as the performance metric due to the class imbalance in the TMED-2 dataset -- making standard accuracy "less suitable" (Huang et al., 2023). The proposed method (SAMIL) was compared to general-purpose multi-instance algorithms and prior methods for AS diagnosis using deep neural networks.

SAMIL performed much better (75.4% balanced accuracy) than 4 other state-of-the-art attention-based MIL architectures tested vs. a range of 60-67% balanced accuracy for existing algorithms.

The chart below from the original paper outlines the balanced accuracy of SAMIL against other approaches dedicated to AS diagnosis (*Filter then Average* and *Weighted Average by View Relevance*), and other general approaches including ABMIL, Set Transformer, and DSMIL.

(Huang et al., 2023)

## Scope of Reproducibility:

The scope of this project is to reproduce the original claims in the paper. Using the existing code provided by the authors of the paper, each model will be trained using the TMED-2 dataset and the paper's claimed Balanced Accuracy scores will be compared to the results of our training.

Scope Summary:

1. Reproduce ABMIL results
2. Reproduce SAMIL results (with Study/Bag Level representation)
3. Reproduce the following ablations: SAMIL w/ Image Level Pretraining, SAMIL w/ No Pretraining.
4. All models to be trained ONLY on Split 1 of the TMED-2 dataset due to computational and time constraints.

## Hypotheses To Be Tested

1. A supervised attention mechanism will provide significant improvements over standard MIL approaches in AS detection rates and detection accuracy, with a smaller model size.
2. Self-supervised pretraining of "study-level" TTE artifacts provides improvements in AS detection rates and detection accuracy over traditional "image-level" pretraining, or no pretraining at all.

## Planned Ablations

The paper has two ablations targeting the attention strategy and the pretraining strategy.

1. Attention: The attention mechanisms within the pooling layer  $\sigma$  to be tested are the baseline ABMIL model, ABMIL with gated attention, and the SAMIL model without pretraining. The paper compares the performance of these three approaches and identifies that SAMIL's supervised attention model outperforms ABMIL (the baseline model that SAMIL builds upon) by +1200 bps. The Github repo scripts includes parameters to control the attention mechanism for ABMIL (gated\_attention vs. attention), and SAMIL with and without pretraining.
2. Pre Training: The paper introduces a novel approach of built-in study-level (i.e., bag-level) pretraining. This ablation compares different pretraining strategies including: image-level contrastive learning and no pretraining to the study-level pretraining approach. The paper finds no improvements with image-level pretraining, but the study-level pretraining shows improvements of +480 bps. The Github repo scripts include parameters to control pretraining options of: study level, image level, and none.

## Methodology

To reproduce this paper, the following pre-requisites must be acquired:

1. Access to the TMED-2 dataset here ([https://tmmed.cs.tufts.edu/tmed\\_v2.html](https://tmmed.cs.tufts.edu/tmed_v2.html))
2. Download the pretrained view classifiers, MOCCO pretrained checkpoints, and training curves of SAMIL from the paper's Github repo here

(<https://tufts.box.com/s/c5w8123j7h3dpls75jye1363uh8qv8us>). Once downloaded, upload the entire unzipped folder to your Google Drive (see path below).

The methodology for reproduction is as follows:

1. Create and train the ABMIL model
2. Create and train the SAMIL model with no Pretraining
3. Train the SAMIL model with Image Level Pretraining
4. Train the SAMIL model with Study Level Pretraining

The model definitions and helper methods are pulled from the paper's Github repo.

## Environment Setup

The reproduction of the paper was completed entirely in Google Colab with the Pro+ subscription.

At the time of reproduction, Google Colab was running Python 3.10 runtime and PyTorch v2.2.0 was used. All training was completed with an Nvidia A100 GPU through the Colab Pro+ subscription.

This notebook assumes the following:

1. You will execute this in Google Colab
2. You have access to Google Drive
3. You have access to GPU compute resources
4. You have access to the TMED-2 dataset.

## Python Libraries

The following libraries are used in this notebook, and are available in Colab out of the box.

- Numpy
- Pandas
- PyTorch
- Torch Vision
- TQDM
- Matplotlib

```
In [ ]: import math
import glob
import random
import numpy as np
import pandas as pd
import matplotlib.pyplot as plt
import torch
import torch.nn as nn
import torch.nn.functional as F
import torch.optim as optim
import torchvision
from torch.utils.data import Dataset, DataLoader
from torchvision.transforms import v2 as transforms
from tqdm import tqdm
from collections import defaultdict

trainingSeed = 0
batchSize = 1
numWorkers = 8
random.seed(trainingSeed)
np.random.seed(trainingSeed)
torch.manual_seed(trainingSeed)

device = torch.device('cuda' if torch.cuda.is_available() else 'cpu')
```

## Data

### Download Instruction

The dataset used by the paper is the TMED-2 dataset ([https://tmmed.cs.tufts.edu/tmed\\_v2.html](https://tmmed.cs.tufts.edu/tmed_v2.html)), containing transthoracic echocardiogram (TTE) imagery from routine care of patients at Tufts Medical Center. The dataset can be downloaded once submitting an access request from the dataset owners on their TMED-2 website. This dataset is private and cannot be shared.

Once downloaded, the paper uses the ( `view_and_diagnosis_labeled_set` ), consisting of 599 studies from 577 patients. The patients are labeled by board certified medical staff with the following values: none, early AS, or significant AS. The dataset has been partitioned into different splits, each containing 360 training studies, 119 validation studies, and 120 test studies. As mentioned, this reproduction only uses Split 1.

### Data Setup

Because the dataset is private access, the dataset must be uploaded somewhere accessible via this notebook. For the project, the `labeled` and `unlabeled` zip folders from the `view_and_diagnosis_labeled_set` folder were uploaded to Google Drive to the following path:

```
DATA_DIR = '/content/drive/MyDrive/DL4H-TMED2/'
```

**! PLEASE READ:** If you do not have access to the TMED-2 dataset or have not uploaded the `labeled.zip` and `unlabeled.zip` folders to Google Drive yet, the following in this notebook is not be executable.

TMED-2 is a private dataset and cannot be uploaded / shared. Please upload the zipped labeled and unlabeled folders to Colab or via Google Drive, and set the `DATA_DIR` directory below.

```
In [ ]: import os
import gdown
import zipfile
from google.colab import drive
import warnings
warnings.filterwarnings('ignore')

# NOTE: Remove when tested
MODEL_CHECKPOINTS = '/content/drive/MyDrive/SAMIL/model_checkpoints'
DATA_INFO_DIR = '/content/drive/MyDrive/SAMIL/data_info'

# Download the model checkpoints for SAMIL ('StudyLevel', 'ImageLevel', and 'view_c
gdown.download_folder(id="1-NCYcvUj5eDmYU127JG5b1Sy0f2Ak5gB", output="/content/mode

# Download the data info directory provided by the paper repo.
gdown.download_folder(id="1-RJ5_61zFGuuLVdnWIX35ku4mkrwiaLw", output="/content/data

# Set path for dataset
LOCAL_DATA_DIR = '/content/data/'

# Set path for model checkpoints
MODEL_CHECKPOINTS = '/content/model_checkpoints'

# Set path for data info
DATA_INFO_DIR = '/content/data_info'

# <SET YOUR PATH IN 'DATA_DIR' TO YOUR LABELED AND UNLABED ZIPS OF THE TMED-2 DATAS
DATA_DIR = '/content/drive/MyDrive/DL4H-TMED2/'

drive.mount('/content/drive', force_remount=True)

with zipfile.ZipFile(DATA_DIR + 'labeled.zip', 'r') as zip_ref:
    zip_ref.extractall('/content/data')

with zipfile.ZipFile(DATA_DIR + 'unlabeled.zip', 'r') as zip_ref:
    zip_ref.extractall('/content/data')

TMED2SummaryTable = pd.read_csv(os.path.join(DATA_INFO_DIR, 'TMED2SummaryTable.csv'))
SEED_DIR = DATA_INFO_DIR + '/DataPartition/seed0/DEV479/FullyLabeledSet_studies'

train_PatientStudy_list = pd.read_csv(os.path.join(SEED_DIR, "train_studies.csv"))
val_PatientStudy_list = pd.read_csv(os.path.join(SEED_DIR, "val_studies.csv"))
test_PatientStudy_list = pd.read_csv(os.path.join(SEED_DIR, "test_studies.csv"))

train_PatientStudy_ids = train_PatientStudy_list["study"].values
val_PatientStudy_ids = val_PatientStudy_list["study"].values
test_PatientStudy_ids = test_PatientStudy_list["study"].values
```

Retrieving folder contents

```
Retrieving folder 10UyanbRrCBV2M5vGaSxW9TSMp2MxNoJb .ipynb_checkpoints
Retrieving folder 10QbxkUr1G__hbnFzYRqRY5DsAw6Wq-G1 MOCO_Pretraining_ImageLevel
Processing file 14430kLt62g5JTaX0f6P1-lCZc_pvZ0d7 seed0_checkpoint.pt
Retrieving folder 10URp36wBCAUnZn7b378TdLaA0Ho5Q7mI MOCO_Pretraining_StudyLevel
Processing file 13uxnsd0kGRAhI6aMgFVPKip4spDyT-rT seed0_checkpoint.pt
Retrieving folder 10Qtm2gG4zYv8pJVB0I7q_a4jkRwGvVdI view_classifier
Processing file 143ewJ5q4162DAiwvqSe6Ija9cI4iPnpu seed0_model_best.pth.tar
Retrieving folder contents completed
Building directory structure
Building directory structure completed
Downloading...
From: https://drive.google.com/uc?id=14430kLt62g5JTaX0f6P1-lCZc_pvZ0d7
To: /content/model_checkpoints/MOCO_Pretraining_ImageLevel/seed0_checkpoint.pt
100%|██████████| 18.4M/18.4M [00:00<00:00, 86.0MB/s]
Downloading...
From: https://drive.google.com/uc?id=13uxnsd0kGRAhI6aMgFVPKip4spDyT-rT
To: /content/model_checkpoints/MOCO_Pretraining_StudyLevel/seed0_checkpoint.pt
100%|██████████| 23.1M/23.1M [00:00<00:00, 47.1MB/s]
Downloading...
From: https://drive.google.com/uc?id=143ewJ5q4162DAiwvqSe6Ija9cI4iPnpu
To: /content/model_checkpoints/view_classifier/seed0_model_best.pth.tar
100%|██████████| 71.4M/71.4M [00:01<00:00, 48.4MB/s]
Download completed
Retrieving folder contents
Retrieving folder 10bTVaY80aMEKT3iNMV10jpuL70ZmeMeW DataPartition
Retrieving folder 15De1RmrhbXTejj_Cw5S28yI_0_weryzk seed0
Retrieving folder 1AQQTQihr2-g_BuD-D8jSUMksaDLGajqY8 DEV479
Retrieving folder 1AiCm6NUziqY8APh0jKSch0qVub_xM0As FullyLabeledSet_studies
Processing file 1AqN3w8A9Hu2n6h02nufx-KtKE-qGmd1m test_studies.csv
Processing file 1ArULbGd217BYgUXSndG9begDJqb3E0u2 train_studies.csv
Processing file 1AtC53aEB2-_7V0rkckph_zP1QhCS4VDo val_studies.csv
Processing file 10mHKpTNIFa7qAF8NlUa48vP2j06L-IZX TMED2SummaryTable.csv
Retrieving folder contents completed
Building directory structure
Building directory structure completed
Downloading...
From: https://drive.google.com/uc?id=1AqN3w8A9Hu2n6h02nufx-KtKE-qGmd1m
To: /content/data_info/DataPartition/seed0/DEV479/FullyLabeledSet_studies/test_studies.csv
100%|██████████| 826/826 [00:00<00:00, 1.07MB/s]
Downloading...
From: https://drive.google.com/uc?id=1ArULbGd217BYgUXSndG9begDJqb3E0u2
To: /content/data_info/DataPartition/seed0/DEV479/FullyLabeledSet_studies/train_studies.csv
100%|██████████| 2.47k/2.47k [00:00<00:00, 3.16MB/s]
Downloading...
From: https://drive.google.com/uc?id=1AtC53aEB2-_7V0rkckph_zP1QhCS4VDo
To: /content/data_info/DataPartition/seed0/DEV479/FullyLabeledSet_studies/val_studies.csv
100%|██████████| 822/822 [00:00<00:00, 852kB/s]
Downloading...
From: https://drive.google.com/uc?id=10mHKpTNIFa7qAF8NlUa48vP2j06L-IZX
To: /content/data_info/TMED2SummaryTable.csv
100%|██████████| 8.63M/8.63M [00:00<00:00, 33.6MB/s]
Download completed
Mounted at /content/drive
```

## Preprocessing

The original paper assumes a different TMED-2 dataset structure than what is actually available from the dataset download.

This `EchoDataset` class has been modified from what was originally in the paper to assume two critical things: 1) the images are PNG vs. TIFF, and 2) do not represent raw images from a video where a "frame" of the video must be sampled using some sampling strategy.

To accomodate this, the `EchoDataset` class simply retrieves all the PNG images from the data directory setup in prior steps (`labeled.zip` and `unlabeled.zip` steps).

```
In [ ]: from PIL import Image
from torch.utils.data import Dataset

DiagnosisStr_to_Int_Mapping={
    'no_AS':0,
    'mild_AS':1,
    'mildtomod_AS':1,
    'moderate_AS':2,
    'severe_AS':2
}

class EchoDataset(Dataset):
    def __init__(self, PatientStudy_list, TMED2SummaryTable, ML_DATA_dir, sampling_):

        self.PatientStudy_list = PatientStudy_list
        self.TMED2SummaryTable = TMED2SummaryTable #note: using the patient_id column
        self.ML_DATA_dir = ML_DATA_dir

        self.sampling_strategy = sampling_strategy
        self.training_seed=training_seed
        self.transform_fn = transform_fn
        self.bag_of_PatientStudy_images, self.bag_of_PatientStudy_DiagnosisLabels = 

    def _create_bags(self):

        bag_of_PatientStudy_images = []
        bag_of_PatientStudy_DiagnosisLabels = []

        for PatientStudy in self.PatientStudy_list:
            this_PatientStudyRecords_from_TMED2SummaryTable = self.TMED2SummaryTable.loc[[PatientStudy]]
            assert this_PatientStudyRecords_from_TMED2SummaryTable.shape[0]!=0, 'even if it exists, it must have at least one row'

            this_PatientStudyRecords_from_TMED2SummaryTable_DiagnosisLabel = list(this_PatientStudyRecords_from_TMED2SummaryTable['DiagnosisLabel'])
            assert len(this_PatientStudyRecords_from_TMED2SummaryTable_DiagnosisLabel) == 1, 'there must be exactly one diagnosis label per row'

            this_PatientStudy_DiagnosisLabel = this_PatientStudyRecords_from_TMED2SummaryTable_DiagnosisLabel[0]
            this_PatientStudy_DiagnosisLabel = DiagnosisStr_to_Int_Mapping[this_PatientStudy_DiagnosisLabel]

            this_PatientStudy_Id_ImagesPattern = PatientStudy + ".*.png"
            this_PatientStudy_Id_LabeledImages: list[str] = glob.glob(pathname=this_PatientStudy_Id_ImagesPattern)
            this_PatientStudy_Id_UnlabeledImages: list[str] = glob.glob(pathname=this_PatientStudy_Id_ImagesPattern)

            # From paper repo, sort to ensure order of images are consistent each row
            this_PatientStudy_Id_LabeledImages.sort()
            this_PatientStudy_Id_UnlabeledImages.sort()

            this_PatientStudyImages = []

            for ImagePath in this_PatientStudy_Id_LabeledImages:
                this_PatientStudyImages.append(
                    np.array(Image.open(self.ML_DATA_dir + '/labeled/' + ImagePath))
                )

            self.bag_of_PatientStudy_images.append(this_PatientStudyImages)
            self.bag_of_PatientStudy_DiagnosisLabels.append(this_PatientStudy_DiagnosisLabel)
```

```
    for ImagePath in this_PatientStudy_Id_UnlabeledImages:
        this_PatientStudyImages.append(
            np.array(Image.open(self.ML_DATA_dir + '/unlabeled/' + ImagePath))
        )

    bag_of_PatientStudy_images.append(np.array(this_PatientStudyImages))
    bag_of_PatientStudy_DiagnosisLabels.append(this_PatientStudy_DiagnosisLabels)

    return bag_of_PatientStudy_images, bag_of_PatientStudy_DiagnosisLabels

def __len__(self):
    return len(self.bag_of_PatientStudy_images)

def __getitem__(self, index):

    bag_image = self.bag_of_PatientStudy_images[index]

    if self.transform_fn is not None:
        bag_image = torch.stack([self.transform_fn(Image.fromarray(image, mode='RGB')) for image in bag_image])

    DiagnosisLabel = self.bag_of_PatientStudy_DiagnosisLabels[index]

    return bag_image, DiagnosisLabel
```

## Transformations

```
In [ ]: import PIL
import PIL.ImageOps
import PIL.ImageEnhance
import PIL.ImageDraw
from PIL import Image

PARAMETER_MAX = 10


def AutoContrast(img, **kwargs):
    return PIL.ImageOps.autocontrast(img)


def Brightness(img, v, max_v, bias=0):
    v = _float_parameter(v, max_v) + bias
    return PIL.ImageEnhance.Brightness(img).enhance(v)


def Color(img, v, max_v, bias=0):
    v = _float_parameter(v, max_v) + bias
    return PIL.ImageEnhance.Color(img).enhance(v)


def Contrast(img, v, max_v, bias=0):
    v = _float_parameter(v, max_v) + bias
    return PIL.ImageEnhance.Contrast(img).enhance(v)


def Cutout(img, v, max_v, bias=0):
    if v == 0:
        return img
    v = _float_parameter(v, max_v) + bias
    v = int(v * min(img.size))
    return CutoutAbs(img, v)


def CutoutAbs(img, v, **kwargs):
    w, h = img.size
    x0 = np.random.uniform(0, w)
    y0 = np.random.uniform(0, h)
    x0 = int(max(0, x0 - v / 2.))
    y0 = int(max(0, y0 - v / 2.))
    x1 = int(min(w, x0 + v))
    y1 = int(min(h, y0 + v))
    xy = (x0, y0, x1, y1)
    # gray
    color = (127, 127, 127)
    img = img.copy()
    PIL.ImageDraw.Draw(img).rectangle(xy, color)
    return img


def Equalize(img, **kwargs):
    return PIL.ImageOps.equalize(img)
```

```
def Identity(img, **kwargs):
    return img

def Invert(img, **kwargs):
    return PIL.ImageOps.invert(img)

def Posterize(img, v, max_v, bias=0):
    v = _int_parameter(v, max_v) + bias
    return PIL.ImageOps.posterize(img, v)

def Rotate(img, v, max_v, bias=0):
    v = _int_parameter(v, max_v) + bias
    if random.random() < 0.5:
        v = -v
    return img.rotate(v)

def Sharpness(img, v, max_v, bias=0):
    v = _float_parameter(v, max_v) + bias
    return PIL.ImageEnhance.Sharpness(img).enhance(v)

def ShearX(img, v, max_v, bias=0):
    v = _float_parameter(v, max_v) + bias
    if random.random() < 0.5:
        v = -v
    return img.transform(img.size, PIL.Image.AFFINE, (1, v, 0, 0, 1, 0))

def ShearY(img, v, max_v, bias=0):
    v = _float_parameter(v, max_v) + bias
    if random.random() < 0.5:
        v = -v
    return img.transform(img.size, PIL.Image.AFFINE, (1, 0, 0, v, 1, 0))

def Solarize(img, v, max_v, bias=0):
    v = _int_parameter(v, max_v) + bias
    return PIL.ImageOps.solarize(img, 256 - v)

def SolarizeAdd(img, v, max_v, bias=0, threshold=128):
    v = _int_parameter(v, max_v) + bias
    if random.random() < 0.5:
        v = -v
    img_np = np.array(img).astype(np.int)
    img_np = img_np + v
    img_np = np.clip(img_np, 0, 255)
    img_np = img_np.astype(np.uint8)
    img = Image.fromarray(img_np)
    return PIL.ImageOps.solarize(img, threshold)

def TranslateX(img, v, max_v, bias=0):
    v = _float_parameter(v, max_v) + bias
    if random.random() < 0.5:
        v = -v
```

```

    v = int(v * img.size[0])
    return img.transform(img.size, PIL.Image.AFFINE, (1, 0, v, 0, 1, 0))

def TranslateY(img, v, max_v, bias=0):
    v = _float_parameter(v, max_v) + bias
    if random.random() < 0.5:
        v = -v
    v = int(v * img.size[1])
    return img.transform(img.size, PIL.Image.AFFINE, (1, 0, 0, 0, 1, v))

def _float_parameter(v, max_v):
    return float(v) * max_v / PARAMETER_MAX

def _int_parameter(v, max_v):
    return int(v * max_v / PARAMETER_MAX)

def fixmatch_augment_pool():
    # FixMatch paper
    augs = [(AutoContrast, None, None),
            (Brightness, 0.9, 0.05),
            (Color, 0.9, 0.05),
            (Contrast, 0.9, 0.05),
            (Equalize, None, None),
            (Identity, None, None),
            (Posterize, 4, 4),
            (Rotate, 30, 0),
            (Sharpness, 0.9, 0.05),
            (ShearX, 0.3, 0),
            (ShearY, 0.3, 0),
            (Solarize, 256, 0),
            (TranslateX, 0.3, 0),
            (TranslateY, 0.3, 0)]
    return augs

class RandAugmentMC(object):
    def __init__(self, n, m):
        assert n >= 1
        assert 1 <= m <= 10
        self.n = n
        self.m = m
        self.augment_pool = fixmatch_augment_pool()

    def __call__(self, img):
        ops = random.choices(self.augment_pool, k=self.n)
        for op, max_v, bias in ops:
            v = np.random.randint(1, self.m)
            if random.random() < 0.5:
                img = op(img, v=v, max_v=max_v, bias=bias)
        img = CutoutAbs(img, int(32*0.5))
        return img

```

```
In [ ]: transform_eval = transforms.Compose([
    transforms.ToImage(),
    transforms.ToDtype(torch.float32, scale=True)
])

transform_train = transforms.Compose(
    [
        transforms.RandomHorizontalFlip(),
        transforms.RandomCrop(
            size=112, padding=int(112 * 0.125), padding_mode="reflect"
        ),
        transforms.ToImage(),
        transforms.ToDtype(torch.float32, scale=True),
    ]
)

transform_train_randaug = transforms.Compose([
    transforms.RandomHorizontalFlip(),
    transforms.RandomCrop(size=112,
                          padding=int(112*0.125),
                          padding_mode='reflect'),
    RandAugmentMC(n=2, m=10),
    transforms.ToImage(),
    transforms.ToDtype(torch.float32, scale=True)
])
```

## Create Dataset

The following three code blocks create the EchoDatasets for training, validation, and test. One caveat is SAMIL uses a training dataset with the `RandAugmentMC` transformation, however ABMIL does not.

```
In [ ]: train_dataset = EchoDataset(train_PatientStudy_ids, TMED2SummaryTable, LOCAL_DATA_DIR)

train_dataset_randaug = EchoDataset(train_PatientStudy_ids, TMED2SummaryTable, LOCAL_DATA_DIR)

val_dataset = EchoDataset(val_PatientStudy_ids, TMED2SummaryTable, LOCAL_DATA_DIR,)

test_dataset = EchoDataset(test_PatientStudy_ids, TMED2SummaryTable, LOCAL_DATA_DIR)
```

```
In [ ]: print("train: {}, trainmemory: {}, val: {}, test: {}".format(len(train_dataset), len(train_dataset_randaug), len(val_dataset), len(test_dataset)))
train: 360, trainmemory: 360, val: 119, test: 120
```

```
In [ ]: # Create the DataLoader for Training, Validation, and Test

train_loader = DataLoader(train_dataset, batch_size=batchSize, shuffle=True, num_workers=4)
val_loader = DataLoader(val_dataset, batch_size=batchSize, shuffle=False, num_workers=4)
test_loader = DataLoader(test_dataset, batch_size=batchSize, shuffle=False, num_workers=4)
```

## Dataset Analysis

Statistics about the training, validation, and test datasets below.

```
In [ ]: def generate_stats(data_loader):
    label_counts = defaultdict(int)
    bag_sizes = defaultdict(list)
    image_dimensions = []
    label_mapping = ["no_AS", "mod_AS", "sev_AS"]

    for data, label in data_loader:
        label_counts[label.item()] += 1
        bag_sizes[label.item()].append(data.shape[1])
        for image in data:
            image_dimensions.append(image.shape[1:]) # Assuming data is in (batch_size, height, width, channels)

    # Label counts
    print("Label Counts:")
    for i, diagnosis in enumerate(label_mapping):
        count = label_counts[i]
        print(f"{diagnosis}\t: count = {count}")

    # Bag size statistics
    print("\nBag Size Statistics:")
    for i, diagnosis in enumerate(label_mapping):
        bag_sizes_arr = np.array(bag_sizes[i])
        mean_bag_size = np.mean(bag_sizes_arr)
        min_bag_size = np.min(bag_sizes_arr)
        max_bag_size = np.max(bag_sizes_arr)
        print(f"{diagnosis}\t: mean = {mean_bag_size}, min = {min_bag_size}, max = {max_bag_size}")

    # Image dimension statistics
    print("\nImage Dimension Statistics:")
    image_dimensions_arr = np.array(image_dimensions)
    mean_image_dim = np.mean(image_dimensions_arr, axis=0)
    min_image_dim = np.min(image_dimensions_arr, axis=0)
    max_image_dim = np.max(image_dimensions_arr, axis=0)
    print(f"Mean Image Dimensions: {mean_image_dim}")
    print(f"Minimum Image Dimensions: {min_image_dim}")
    print(f"Maximum Image Dimensions: {max_image_dim}")

    print("-----")

print(f"Dataset Statistics for Training Set:")
print("-----")
generate_stats(train_loader)

print(f"Dataset Statistics for Validation Set:")
print("-----")
generate_stats(val_loader)

print(f"Dataset Statistics for Test Set:")
print("-----")
generate_stats(test_loader)
```

Dataset Statistics for Training Set:

---

Label Counts:

no\_AS : count = 76  
mod\_AS : count = 103  
sev\_AS : count = 181

Bag Size Statistics:

no\_AS : mean = 68.48684210526316, min = 38, max = 113  
mod\_AS : mean = 75.87378640776699, min = 20, max = 177  
sev\_AS : mean = 74.62983425414365, min = 15, max = 181

Image Dimension Statistics:

Mean Image Dimensions: [ 3. 112. 112.]  
Minimum Image Dimensions: [ 3 112 112]  
Maximum Image Dimensions: [ 3 112 112]

---

Dataset Statistics for Validation Set:

---

Label Counts:

no\_AS : count = 25  
mod\_AS : count = 34  
sev\_AS : count = 60

Bag Size Statistics:

no\_AS : mean = 73.24, min = 38, max = 111  
mod\_AS : mean = 72.08823529411765, min = 43, max = 128  
sev\_AS : mean = 72.76666666666667, min = 28, max = 120

Image Dimension Statistics:

Mean Image Dimensions: [ 3. 112. 112.]  
Minimum Image Dimensions: [ 3 112 112]  
Maximum Image Dimensions: [ 3 112 112]

---

Dataset Statistics for Test Set:

---

Label Counts:

no\_AS : count = 26  
mod\_AS : count = 34  
sev\_AS : count = 60

Bag Size Statistics:

no\_AS : mean = 67.92307692307692, min = 28, max = 102  
mod\_AS : mean = 71.11764705882354, min = 46, max = 94  
sev\_AS : mean = 75.0, min = 37, max = 176

Image Dimension Statistics:

Mean Image Dimensions: [ 3. 112. 112.]  
Minimum Image Dimensions: [ 3 112 112]  
Maximum Image Dimensions: [ 3 112 112]

---

From the statistics above, we find that the dataset is biased towards severe cases of AS. This is concerning as the purpose of the paper is to improve the detection of AS, but the author's identify that early detection is key for a high survival rate. By overindexing on severe AS cases, there is risk that the model does not perform as well for cases of early or moderate AS. In general, the dataset is fairly small when measured by # of studies.

Method to select and display random images from one of the data loaders, for example the `train_loader`.

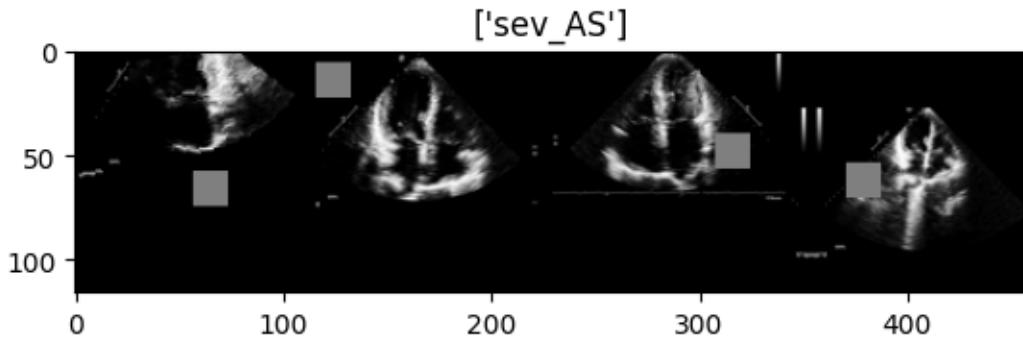
```
In [ ]: # Image loading code modified from https://pytorch.org/tutorials/beginner/transfer_
code_to_diagnosis = ["no_AS", "mod_AS", "sev_AS"]

def imshow(inp, title=None):
    """Display image for Tensor."""
    inp = inp.numpy().transpose((1, 2, 0))
    plt.imshow(inp)
    if title is not None:
        plt.title(title)
    plt.pause(0.001) # pause a bit so that plots are updated

# Get a batch of training data
inputs, classes = next(iter(train_loader))
inputs = inputs.squeeze(0) # Remove singleton batch dimension to produce tensor with
inputs = inputs[:4] # Select 4 images

# Make a grid from batch
out = torchvision.utils.make_grid(inputs)

imshow(out, title=[code_to_diagnosis[x] for x in classes])
```



## Model

The paper evaluates multiple models in addition to the SAMIL model they have contributed. These models include ABMIL and DSMIL. As mentioned previously, only ABMIL and SAMIL will be trained in this reproduction.

## Citation

```
@misc{huang2024detecting, title={Detecting Heart Disease from Multi-View Ultrasound Images via Supervised Attention Multiple Instance Learning}, author={Zhe Huang and Benjamin S. Wessler and Michael C. Hughes}, year={2024}, eprint={2306.00003}, archivePrefix={arXiv}, primaryClass={eess.IV} }
```

## Repo Link

<https://github.com/tufts-ml/SAMIL> (<https://github.com/tufts-ml/SAMIL>)

## SAMIL Model

The SAMIL model is based on the concept of Multiple Instance Learning (MIL). With MIL, instead of labeling individual samples, you produce a "bag" or "study" of samples, and then label the entire bag. In the context of this paper, a bag represents ultrasound images from a single patient study, with a label indicating if the study showed no AS, mild to moderate AS, or severe AS.

In addition to MIL, SAMIL introduces an attention mechanism to weigh the importance of different "views" in the study - as some views are more important/informative than others (e.g., those that show an aortic valve). In this case, a "view" is a certain position of the ultrasound device around the heart. This enables the model to only consider the most relevant information from the set of images in the study.

Lastly, SAMIL introduces a supervised approach unlike other MIL approaches which are unsupervised. This means that a pretrained model is provided during training with labeled images, or labeled bags - dependent on which approach is being used. The paper introduces two types of pretraining: Bag Level and Image Level. The authors implemented this as a "View Classifier" class, and the code has been ported into this notebook.

## SAMIL - WideResNet

When the SAMIL model is pretrained using bag-level or image-level contrastive learning, the View Classifier maps an image to the probability that it shows a relevant view of an aortic valve (either a PLAX or PSAX view) vs. another type such as A2C, A4C, A5C.

This code is pulled directly from the paper repo without modifications.

```
In [ ]: import logging

import torch
import torch.nn as nn
import torch.nn.functional as F
import sys

logging.basicConfig(format='%(asctime)s | %(levelname)s : %(message)s',
                    level=logging.INFO, stream=sys.stdout)
logger = logging.getLogger(__name__)
logger.setLevel(logging.INFO)

def mish(x):
    """Mish: A Self Regularized Non-Monotonic Neural Activation Function (https://arxiv.org/abs/1908.08703)
    return x * torch.tanh(F.softplus(x))

class PSBatchNorm2d(nn.BatchNorm2d):
    """How Does BN Increase Collapsed Neural Network Filters? (https://arxiv.org/abs/1805.11302)
    def __init__(self, num_features, alpha=0.1, eps=1e-05, momentum=0.001, affine=True):
        super().__init__(num_features, eps, momentum, affine, track_running_stats)
        self.alpha = alpha

    def forward(self, x):
        return super().forward(x) + self.alpha

class BasicBlock(nn.Module):
    def __init__(
        self,
        in_planes,
        out_planes,
        stride,
        drop_rate=0.0,
        activate_before_residual=False,
    ):
        super(BasicBlock, self).__init__()
        self.bn1 = nn.BatchNorm2d(in_planes, momentum=0.001)
        self.relu1 = nn.LeakyReLU(negative_slope=0.1, inplace=True)
        self.conv1 = nn.Conv2d(
            in_planes, out_planes, kernel_size=3, stride=stride, padding=1, bias=False
        )
        self.bn2 = nn.BatchNorm2d(out_planes, momentum=0.001)
        self.relu2 = nn.LeakyReLU(negative_slope=0.1, inplace=True)
        self.conv2 = nn.Conv2d(
            out_planes, out_planes, kernel_size=3, stride=1, padding=1, bias=False
        )
        self.drop_rate = drop_rate
        self.equalInOut = in_planes == out_planes
        self.convShortcut = (
            (not self.equalInOut)
            and nn.Conv2d(
                in_planes,
                out_planes,
                kernel_size=1,
                stride=stride,
                padding=0,
                bias=False
            )
        )
```

```

        padding=0,
        bias=False,
    )
    or None
)
self.activate_before_residual = activate_before_residual

def forward(self, x):
    if not self.equalInOut and self.activate_before_residual == True:
        x = self.relu1(self.bn1(x))
    else:
        out = self.relu1(self.bn1(x))
    out = self.relu2(self.bn2(self.conv1(out if self.equalInOut else x)))
    if self.drop_rate > 0:
        out = F.dropout(out, p=self.drop_rate, training=self.training)
    out = self.conv2(out)
    return torch.add(x if self.equalInOut else self.convShortcut(x), out)

class NetworkBlock(nn.Module):
    def __init__(
        self,
        nb_layers,
        in_planes,
        out_planes,
        block,
        stride,
        drop_rate=0.0,
        activate_before_residual=False,
    ):
        super(NetworkBlock, self).__init__()
        self.layer = self._make_layer(
            block,
            in_planes,
            out_planes,
            nb_layers,
            stride,
            drop_rate,
            activate_before_residual,
        )

        def _make_layer(
            self,
            block,
            in_planes,
            out_planes,
            nb_layers,
            stride,
            drop_rate,
            activate_before_residual,
        ):
            layers = []
            for i in range(int(nb_layers)):
                layers.append(
                    block(
                        i == 0 and in_planes or out_planes,
                        out_planes,
                        i == 0 and stride or 1,
                        drop_rate,
                        activate_before_residual,
                    )
                )
            return nn.Sequential(*layers)
    
```

```

        )
    )
return nn.Sequential(*layers)

def forward(self, x):
    return self.layer(x)

class WideResNet(nn.Module):
    def __init__(self, num_classes, depth=28, widen_factor=2, drop_rate=0.0):
        super(WideResNet, self).__init__()
        channels = [
            16,
            16 * widen_factor,
            32 * widen_factor,
            64 * widen_factor,
            128 * widen_factor,
        ]
        assert (depth - 4) % 6 == 0
        n = (depth - 4) / 6 # equivalent to 'repeat' in tf repo
        block = BasicBlock
        # 1st conv before any network block
        self.conv1 = nn.Conv2d(
            3, channels[0], kernel_size=3, stride=1, padding=1, bias=False
        )
        # 1st block
        self.block1 = NetworkBlock(
            n,
            channels[0],
            channels[1],
            block,
            1,
            drop_rate,
            activate_before_residual=True,
        )
        # 2nd block
        self.block2 = NetworkBlock(n, channels[1], channels[2], block, 2, drop_rate)
        # 3rd block
        self.block3 = NetworkBlock(n, channels[2], channels[3], block, 2, drop_rate)

        # 4th block (hz added)
        self.block4 = NetworkBlock(n, channels[3], channels[4], block, 2, drop_rate)

        # global average pooling and classifier
        self.bn1 = nn.BatchNorm2d(channels[4], momentum=0.001)
        self.relu = nn.LeakyReLU(negative_slope=0.1, inplace=True)
        self.fc = nn.Linear(channels[4], num_classes)
        self.channels = channels[4]

    for m in self.modules():
        if isinstance(m, nn.Conv2d):
            nn.init.kaiming_normal_(
                m.weight, mode="fan_out", nonlinearity="leaky_relu"
            )
        elif isinstance(m, nn.BatchNorm2d):
            nn.init.constant_(m.weight, 1.0)
            nn.init.constant_(m.bias, 0.0)
        elif isinstance(m, nn.Linear):
            nn.init.xavier_normal_(m.weight)
            nn.init.constant_(m.bias, 0.0)

```

```

def forward(self, x):
    out = self.conv1(x)
    out = self.block1(out)
    out = self.block2(out)
    out = self.block3(out)
    out = self.block4(out)

    out = self.relu(self.bn1(out))
    out = F.adaptive_avg_pool2d(out, 1)
    out = out.view(-1, self.channels)
    return self.fc(out)

def build_wideresnet(depth, widen_factor, dropout, num_classes):
    return WideResNet(
        depth=depth,
        widen_factor=widen_factor,
        drop_rate=dropout,
        num_classes=num_classes,
    )

```

## SAMIL Model

The SAMIL model has several layers, consisting of these major components:

1. A three part feature extractor consisting of a stack of convolution layers to extract features from the input images and then further process them.
2. Two parallel attention mechanisms to output attention weights with `tanh` activations for non-linearity. One attention mechanism is for the view-classifier-supervised attention, and other is a flexible attention. This enables the freedom to focus on certain images over others.
3. Classifier layer maps the final representation of the "bag" to the output classes.

The SAMIL class is unmodified code from the paper repo.

```
In [ ]: import torch
import torch.nn as nn
import torch.nn.functional as F

class SAMIL(nn.Module):
    def __init__(self, num_classes=3):
        super(SAMIL, self).__init__()
        self.L = 500
        self.B = 250
        self.D = 128
        self.K = 1
        self.num_classes = num_classes

        self.feature_extractor_part1 = nn.Sequential(
            nn.Conv2d(3, 20, kernel_size=5),
            nn.ReLU(),
            nn.MaxPool2d(2, stride=2),
            nn.Conv2d(20, 50, kernel_size=5),
            nn.ReLU(),
            nn.MaxPool2d(2, stride=2),
            # Below layers added in addition to original ABMIL paper
            nn.Conv2d(50, 100, kernel_size=5),
            nn.ReLU(),
            nn.MaxPool2d(2, stride=2),
            nn.Conv2d(100, 200, kernel_size=3),
            nn.ReLU(),
            nn.MaxPool2d(2, stride=2),
        )

        self.feature_extractor_part2 = nn.Sequential(
            nn.Linear(200 * 4 * 4, self.L),
            nn.ReLU(),
        )

        self.feature_extractor_part3 = nn.Sequential(
            nn.Linear(self.L, self.B),
            nn.ReLU(),
            nn.Linear(self.B, self.L),
            nn.ReLU(),
        )

        self.attention_V = nn.Sequential(
            nn.Linear(self.L, self.D), nn.Tanh(), nn.Linear(self.D, self.K)
        )

        self.attention_U = nn.Sequential(
            nn.Linear(self.L, self.D), nn.Tanh(), nn.Linear(self.D, self.K)
        )

        self.classifier = nn.Sequential(
            nn.Linear(self.L * self.K, self.num_classes),
        )

    def forward(self, x):
        x = x.squeeze(0)

        H = self.feature_extractor_part1(x)
        H = H.view(-1, 200 * 4 * 4)
        H = self.feature_extractor_part2(H)
```

```

A_V = self.attention_V(H)  # NxK
A_V = torch.transpose(A_V, 1, 0)  # KxN
A_V = F.softmax(A_V, dim=1)  # softmax over number of images

H = self.feature_extractor_part3(H)

A_U = self.attention_U(H)  # NxK
A_U = torch.transpose(A_U, 1, 0)  # KxN
A_U = F.softmax(A_U, dim=1)  # softmax over number of images

A = torch.exp(
    torch.log(A_V) + torch.log(A_U)
)  # numerically more stable softmax implementation
A = A / torch.sum(A)

M = torch.mm(A, H)  # KxL, M can be regarded as final representation of this image

out = self.classifier(M)  # Outputs logits and not softmax

return out, A_V  # Only view regularize one branch of the attention weights

```

## SAMIL Helpers

The following helper methods are from the paper's Github repo. Specifically the `src/SAMIL/main.py` file.

```
In [ ]: import pandas as pd
import numpy as np
import torch
import torch.nn.functional as F
import torch.optim as optim
from torch.optim.lr_scheduler import LambdaLR
from torch.utils.data import DataLoader
from torchvision.transforms import v2 as transforms

logger = logging.getLogger(__name__)

def save_checkpoint(state, checkpoint_dir, filename='last_checkpoint.pth.tar', write_to_gdrive=False):
    '''last_checkpoint.pth.tar or xxx_model_best.pth.tar'''

    filepath = os.path.join(checkpoint_dir, filename)
    torch.save(state, filepath)

    if write_to_gdrive:
        gd_filepath = os.path.join('/content/drive/MyDrive/SAMIL/checkpoints', filename)
        torch.save(state, gd_filepath)

def set_seed(seed):
    random.seed(seed)
    np.random.seed(seed)
    torch.manual_seed(seed)

def get_cosine_schedule_with_warmup(optimizer,
                                    lr_warmup_epochs,
                                    lr_cycle_epochs, #total train epochs
                                    num_cycles=7./16.,
                                    last_epoch=-1):
    def _lr_lambda(current_epoch):
        if current_epoch < lr_warmup_epochs:
            return float(current_epoch) / float(max(1, lr_warmup_epochs))

        #see if using restart
        #####
        if current_epoch%lr_cycle_epochs==0:
            current_cycle_epoch=lr_cycle_epochs
        else:
            current_cycle_epoch = current_epoch%lr_cycle_epochs

        no_progress = float(current_cycle_epoch - lr_warmup_epochs) / \
                     float(max(1, float(lr_cycle_epochs) - lr_warmup_epochs))
        #####
        return max(0., math.cos(math.pi * num_cycles * no_progress))

    return LambdaLR(optimizer, _lr_lambda, last_epoch)

def create_view_model(view_checkpoint_path=''):
    view_model = build_wideresnet(depth=28,
                                  widen_factor=2,
                                  dropout=0.0,
                                  num_classes=3)

    if view_checkpoint_path != '':

```

```

view_checkpoint = torch.load(view_checkpoint_path)
view_model.load_state_dict(view_checkpoint['ema_state_dict'])
view_model.eval()

logger.info("Total params for View Model: {:.2f}M".format(
    sum(p.numel() for p in view_model.parameters())/1e6))

return view_model

def create_model(MIL_checkpoint_path):
    model = SAMIL()

    if MIL_checkpoint_path != '':
        print("Using checkpoint path: {}".format(MIL_checkpoint_path))
        pretrained_dict = torch.load(MIL_checkpoint_path)

        from collections import OrderedDict
        new_state_dict = OrderedDict()

        for k, v in pretrained_dict.items():
            if 'encoder_q' in k:
                name = '.'.join(k.split('.')[1:])
                new_state_dict[name] = v

        model_dict = model.state_dict()

        new_state_dict = {k: v for k, v in new_state_dict.items() if k in model_dict}
        model_dict.update(new_state_dict)

        model.load_state_dict(model_dict)

        logger.info("Total params: {:.2f}M".format(
            sum(p.numel() for p in model.parameters() if p.requires_grad)/1e6))

    return model

```

## ABMIL Model

The ABMIL model is an "off-the-shelf" attention based MIL model. Compared to SAMIL, ABMIL does not utilize a pretrained view classifier, and only has a single attention mechanism (vs. the dual attention mechanism in SAMIL).

```
In [ ]: class Attention(nn.Module):
    def __init__(self, num_classes=3):
        super(Attention, self).__init__()
        self.L = 500
        self.B = 250
        self.D = 128
        self.K = 1
        self.num_classes = num_classes

        self.feature_extractor_part1 = nn.Sequential(
            nn.Conv2d(3, 20, kernel_size=5),
            nn.ReLU(),
            nn.MaxPool2d(2, stride=2),
            nn.Conv2d(20, 50, kernel_size=5),
            nn.ReLU(),
            nn.MaxPool2d(2, stride=2),
            nn.Conv2d(50, 100, kernel_size=5),
            nn.ReLU(),
            nn.MaxPool2d(2, stride=2),
            nn.Conv2d(100, 200, kernel_size=3),
            nn.ReLU(),
            nn.MaxPool2d(2, stride=2),
        )

        self.feature_extractor_part2 = nn.Sequential(
            nn.Linear(200 * 4 * 4, self.L),
            nn.ReLU(),
        )

        self.feature_extractor_part3 = nn.Sequential(
            nn.Linear(self.L, self.B),
            nn.ReLU(),
            nn.Linear(self.B, self.L),
            nn.ReLU(),
        )

        self.attention = nn.Sequential(
            nn.Linear(self.L, self.D),
            nn.Tanh(),
            nn.Linear(self.D, self.K)
        )

        self.classifier = nn.Sequential(
            nn.Linear(self.L*self.K, self.num_classes),
        )

    def forward(self, x):
        x = x.squeeze(0)
        H = self.feature_extractor_part1(x)
        H = H.view(-1, 200 * 4 * 4)
        H = self.feature_extractor_part2(H) # NxL
        H = self.feature_extractor_part3(H) #
        A = self.attention(H) # NxK
        A = torch.transpose(A, 1, 0) # KxN
        A = F.softmax(A, dim=1) # softmax over N
        M = torch.mm(A, H) # KxL #M can be regarded as final representation of thi
```

```

        out = self.classifier(M)

    return out, A #A is the attention weights on each image of the bag

class GatedAttention(nn.Module):
    def __init__(self, num_classes=3):
        super(GatedAttention, self).__init__()
        self.L = 500
        self.B = 250
        self.D = 128
        self.K = 1
        self.num_classes = num_classes

        self.feature_extractor_part1 = nn.Sequential(
            nn.Conv2d(3, 20, kernel_size=5),
            nn.ReLU(),
            nn.MaxPool2d(2, stride=2),
            nn.Conv2d(20, 50, kernel_size=5),
            nn.ReLU(),
            nn.MaxPool2d(2, stride=2),
            nn.Conv2d(50, 100, kernel_size=5),
            nn.ReLU(),
            nn.MaxPool2d(2, stride=2),
            nn.Conv2d(100, 200, kernel_size=3),
            nn.ReLU(),
            nn.MaxPool2d(2, stride=2),
        )

        self.feature_extractor_part2 = nn.Sequential(
            nn.Linear(200 * 4 * 4, self.L),
            nn.ReLU(),
        )

        self.feature_extractor_part3 = nn.Sequential(
            nn.Linear(self.L, self.B),
            nn.ReLU(),
            nn.Linear(self.B, self.L),
            nn.ReLU(),
        )

        self.attention_V = nn.Sequential(
            nn.Linear(self.L, self.D),
            nn.Tanh()
        )

        self.attention_U = nn.Sequential(
            nn.Linear(self.L, self.D),
            nn.Sigmoid()
        )

        self.attention_weights = nn.Linear(self.D, self.K)

        self.classifier = nn.Sequential(
            nn.Linear(self.L*self.K, self.num_classes),
        )

    def forward(self, x):
        x = x.squeeze(0)

```

```

H = self.feature_extractor_part1(x)
H = H.view(-1, 200 * 4 * 4)
H = self.feature_extractor_part2(H) # NxL
H = self.feature_extractor_part3(H) # NxL
A_V = self.attention_V(H) # NxD
A_U = self.attention_U(H) # NxD
A = self.attention_weights(A_V * A_U) # element wise multiplication # NxK
A = torch.transpose(A, 1, 0) # KxN
A = F.softmax(A, dim=1) # softmax over N
M = torch.mm(A, H) # KxL #M can be regarded as final representation of this bag
out = self.classifier(M)

return out, A #A is the attention weights on each image of the bag

```

## SAMIL Training

The method below sets up various arguments around pretraining. The paper explores three methods of training: No Pretraining, pre training the Feature Extractor (to learn instance-level representations), and pre training the study-level representations of all  $K$  images in a routine echocardiogram.

```
In [ ]: logging.basicConfig(
    format="%(asctime)s - %(levelname)s - %(name)s -   %(message)s",
    datefmt="%m/%d/%Y %H:%M:%S",
    level=logging.INFO
)
```

### Train One Epoch and Early Stop Logic

The code block below contains the methods to train a single epoch and the early stop logic.

```
In [ ]: from copy import deepcopy
from sklearn.metrics import balanced_accuracy_score

import torch

import time
from tqdm import tqdm
import torch.nn.functional as F

import logging
from sklearn.metrics import confusion_matrix as sklearn_cm
import numpy as np
import os
import pickle

import torch
import torch.nn as nn

import numpy as np

from sklearn.metrics import confusion_matrix as sklearn_cm

class EarlyStopping:
    """Early stops the training if validation acc doesn't improve after a given patience."""
    def __init__(self, patience=300, initial_count=0, delta=0):
        """
        Args:
            patience (int): How long to wait after last time validation loss improved.
                            Default: 20
            delta (float): Minimum change in the monitored quantity to qualify as an
                           improvement.
                            Default: 0
        """
        self.patience = patience
        self.counter = initial_count
        self.best_score = None
        self.early_stop = False
        self.delta = delta

    def __call__(self, val_acc):
        score = val_acc

        if self.best_score is None:
            self.best_score = score

        elif score <= self.best_score + self.delta:
            self.counter += 1
            if self.counter >= self.patience:
                self.early_stop = True

        else:
            self.best_score = score
            self.counter = 0
```

```

    print('!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!counter: {}, score: {}, best_s')

    return self.counter

def train_one_epoch(lambda_ViewRegularization, train_epoch, ViewRegularization_warmup_pos):
    model.train()
    view_model.eval()
    train_loss = 0

    for data, bag_label in tqdm(train_loader, disable=True):
        optimizer.zero_grad()

        data, bag_label = data.to(device), bag_label.to(device)

        outputs, attentions = model(data)
        outputs, attentions = outputs.to(device), attentions.to(device)

        log_attentions = torch.log(attentions)

        with torch.no_grad():
            view_predictions = view_model(data.squeeze(0))
            view_predictions = view_predictions.to(device)

            softmax_view_predictions = F.softmax(view_predictions, dim=1)

            predicted_relevance = softmax_view_predictions[:, :2]
            predicted_relevance = torch.sum(predicted_relevance, dim=1)

            predicted_relative_relevance = F.softmax(predicted_relevance/T)
            predicted_relative_relevance = predicted_relative_relevance.unsqueeze(0)

            LabeledCELoss = F.cross_entropy(outputs, bag_label, weights, reduction='mean')
            current_warmup = np.clip(epoch/(float(ViewRegularization_warmup_pos) * train_epoch), 0, 1)

            ViewRegularizationLoss = F.kl_div(input=log_attentions, target=predicted_relevance, reduction='sum') / (log_attentions.size(0) * log_attentions.size(1))

            total_loss = LabeledCELoss + lambda_ViewRegularization * ViewRegularizationLoss

            total_loss.backward()
            optimizer.step()

            train_loss += total_loss.detach().cpu().item()

    train_loss = train_loss / len(train_loader)

    return train_loss

def eval_model(data_loader, raw_model, epoch):
    raw_model.eval()

    with torch.no_grad():
        ground_truth_labels = []
        pred_labels = []

        for data, bag_label in data_loader:
            data, bag_label = data.to(device), bag_label.to(device)

```

```
pred_logit, _ = raw_model(data)

pred_label = torch.softmax(pred_logit, dim=-1)
pred_label = torch.argmax(pred_label).item()

pred_labels.append(pred_label)
ground_truth_labels.append(bag_label.item())

bal_acc = balanced_accuracy_score(ground_truth_labels, pred_labels)

return bal_acc
```

## Training Runner

The code block below contains the logic to train the model, one epoch at a time, with early stop, and the logic to write the results out. This method is called in subsequent training blocks after the training arguments are defined.

```
In [ ]: import json

def train_samil(
    train_epoch,
    patience,
    early_stopping_warmup,
    eval_every_Xepoch,
    type,
    experiment_dir,
    weights,
    train_loader,
    val_loader,
    model,
    view_model,
    optimizer,
    scheduler,
    lambda_ViewRegularization,
    ViewRegularization_warmup_pos,
    T
):
    best_val_raw_Bacc = 0
    best_test_raw_Bacc_at_val = 0

    current_count=0

    logger.info("***** Running training *****")
    logger.info(f"  Num Epochs = {train_epoch}")
    logger.info(f"  Total optimization steps = {train_epoch * len(train_dataset)}")

    early_stopping = EarlyStopping(patience, initial_count=current_count)

    train_loss_df = pd.DataFrame(
        index=range(0, train_epoch), columns=["loss"], dtype="Float32"
    )
    val_accuracy_df = pd.DataFrame(
        index=range(0, train_epoch, eval_every_Xepoch),
        columns=["val_raw_Bacc", "test_raw_Bacc"],
        dtype="Float32",
    )

    for epoch in range(train_epoch):
        TotalTrainLoss_this_epoch = train_one_epoch(lambda_ViewRegularization, train_loader)
        train_loss_df.loc[epoch] = TotalTrainLoss_this_epoch
        scheduler.step()

        if epoch % eval_every_Xepoch == 0:
            val_raw_Bacc = eval_model(val_loader, model, epoch)
            val_accuracy_df.loc[[epoch], ["val_raw_Bacc"]] = val_raw_Bacc

            if val_raw_Bacc > best_val_raw_Bacc:
                best_val_raw_Bacc = val_raw_Bacc

            test_raw_Bacc = eval_model(test_loader, model, epoch)
            val_accuracy_df.loc[[epoch], ["test_raw_Bacc"]] = test_raw_Bacc

            if test_raw_Bacc > best_test_raw_Bacc_at_val:
                best_test_raw_Bacc_at_val = test_raw_Bacc
                save_checkpoint(model.state_dict(), experiment_dir, filename="best_checkpoint.pt")
```

```

        logger.info("Epoch: %d | Total Loss: %.2f | Balanced Accuracy: %.2f" %
        logger.info('Best Balanced Accuracy Seen, validation/test: %.2f %.2f' %

    if epoch > early_stopping_warmup:
        current_count = early_stopping(val_raw_Bacc)

    save_checkpoint(model.state_dict(), experiment_dir, filename="last_chec

    if early_stopping.early_stop:
        break

gd_csv_filepath = os.path.join('/content/drive/MyDrive/SAMIL/checkpoints/')

train_loss_df.to_csv(
    gd_csv_filepath + "train_loss_df_{}.csv".format(type), sep=",", header=True
)

val_accuracy_df.to_csv(gd_csv_filepath + "val_accuracy_df_{}.csv".format(type),

```

## Hyperparameters

The final hyperparameters used by the authors are published in their Github repo here:

Hyperparameters (<https://github.com/tufts-ml/SAMIL/blob/main/Hyperparameters/Hyperparameters.txt>)

### SAMIL Hyperparameters

1. Learning rate (lr)
2. Weight decay (wd) for regularizing the model and improving generalization.
3. Temperature (T) scaling term to adjust the softmax output. For higher T, the softmax output becomes softer with more uniform probabilities and reduces the model's confidence across predictions of new, unseen data. A lower T results in a sharper softmax output, increasing the delta between the higher probability and other probabilities, increasing the model's confidence.
4. Lambda View Regularization ( $\lambda_{sA}$ ) to balance the supervised attention loss and cross-entropy loss.

<b>SAMIL (with study-level SSL)</b>	<b>split1</b>	<b>split2</b>	<b>split3</b>
Learning rate	0.0008	0.0005	0.0005
Weight decay	0.0001	0.0001	0.001
Temperature T	0.1	0.05	0.1
$\lambda_{sA}$	15.0	20.0	20.0
Learning rate schedule	cosine	cosine	cosine

In the reproduction of the paper, a learning rate of 0.0005 was used. Only Split 1 was trained.

### ABMIL Hyperparameters

<b>ABMIL</b>	<b>split1</b>	<b>split2</b>	<b>split3</b>
Learning rate	0.0008	0.0005	0.0008

ABMIL	split1	split2	split3
Weight decay	0.0001	0.00005	0.00005
Learning rate schedule	cosine	cosine	cosine

As a reminder, this notebook only reproduces Split 1.

## Computational Requirements

The paper reported using an Nvidia A100 GPU for all training runs. This notebook was run in Google Colab with Pro+ membership and trained using the Colab A100 at a compute unit consumption rate of ~11.77 units / hour. At a cost of ~ \$1.17 USD per hour.

The following statistics were captured during the reproduction of this paper:

Model	Avg Runtime/ Epoch	Number of Trials	GPU hrs used	# Training Epochs
ABMIL	.08s	1	.95	721
SAMIL (no pretraining)	14.7s	1	3	507
SAMIL (image level pretraining)	14.58s	1	2.5	619
SAMIL (bag/study level pretraining)	14.68s	9	4.5	705

When reproducing the paper, SAMIL with Bag Level Pretraining was the first model trained. The paper reported a final learning rate of 0.0008, which was used to train first. This provided unfavorable results with balanced accuracy (0.65), so the learning rate was lowered to 0.0006 with marginal improvements (0.69), and finally lowered to 0.0005 providing the best balanced accuracy. This was then used for the other two SAMIL training runs.

ABMIL produced favorable results using the exact hyperparameters from the paper, so only one trial was needed.

## No Pretraining

This block configures training the SAMIL model without any pretraining. Per the paper, the max epochs is set to 2,000 with a warmup of 200 epochs and patience of 200 epochs.

```
In [ ]: RUNS_DIR = '/content/runs/'

from torch.utils.data import DataLoader

train_loader = DataLoader(
    train_dataset_randaug, batch_size=1, shuffle=True, num_workers=8
)
val_loader = DataLoader(val_dataset, batch_size=1, shuffle=False, num_workers=8)
test_loader = DataLoader(test_dataset, batch_size=1, shuffle=False, num_workers=8)

training_seed= 0
data_seed= 0
checkpoint_dir= MODEL_CHECKPOINTS
MIL_checkpoint_path= ''
lr= 0.0005 # learning rate
wd= 0.0001 # weight decay
T= 0.1 # tempertature
lambda_ViewRegularization= 15.0 #  $\lambda_{sA}$ 
train_dir= RUNS_DIR + 'SAMIL'
resume= 'None'
train_epoch= 2000 # number of epochs, 2000 defined in the paper. CHANGE ME!
device= device
start_epoch= 0
patience= 200
early_stopping_warmup= 200
ViewRegularization_warmup_pos= 0.4
eval_every_Xepoch= 1
experiment_type='NoPretrain'

set_seed(training_seed)
MIL_checkpoint_path = ''
view_checkpoint_path = os.path.join(checkpoint_dir, 'view_classifier', 'seed0_model')

experiment_name = "{}".format(experiment_type)
experiment_dir = os.path.join(train_dir, experiment_name)
os.makedirs(experiment_dir, exist_ok=True)

weights = '0.463,0.342,0.195'
weights = [float(i) for i in weights.split(',')]
weights = torch.Tensor(weights)
weights = weights.to(device)

view_model = create_view_model(view_checkpoint_path).to(device)

model = create_model(MIL_checkpoint_path).to(device)

no_decay = {'bias', 'bn'}
grouped_parameters = [
    {'params': [p for n, p in model.named_parameters() if not any(
        nd in n for nd in no_decay)], 'weight_decay': wd},
    {'params': [p for n, p in model.named_parameters() if any(
        nd in n for nd in no_decay)], 'weight_decay': 0.0}
]
optimizer = optim.SGD(grouped_parameters, lr=lr, momentum=0.9, nesterov=True)
scheduler = get_cosine_schedule_with_warmup(optimizer, 0, train_epoch)

train_samil(
    train_epoch,
```

```
    patience,
    early_stopping_warmup,
    eval_every_Xepoch,
    experiment_type,
    experiment_dir,
    weights,
    train_loader,
    val_loader,
    model,
    view_model,
    optimizer,
    scheduler,
    lambda_ViewRegularization,
    ViewRegularization_warmup_pos,
    T
)
```

```
INFO:__main__:Total params for View Model: 5.93M
INFO:__main__:Total params: 2.31M
INFO:__main__:***** Running training *****
INFO:__main__: Num Epochs = 2000
INFO:__main__: Total optimization steps = 720000
INFO:__main__:Epoch: 0 | Total Loss: 1.09 | Balanced Accuracy: 0.33
INFO:__main__:Best Balanced Accuracy Seen, validation/test: 0.33 0.33
INFO:__main__:Epoch: 1 | Total Loss: 1.08 | Balanced Accuracy: 0.33
INFO:__main__:Best Balanced Accuracy Seen, validation/test: 0.33 0.33
INFO:__main__:Epoch: 2 | Total Loss: 1.10 | Balanced Accuracy: 0.33
INFO:__main__:Best Balanced Accuracy Seen, validation/test: 0.33 0.33
INFO:__main__:Epoch: 3 | Total Loss: 1.12 | Balanced Accuracy: 0.33
INFO:__main__:Best Balanced Accuracy Seen, validation/test: 0.33 0.33
INFO:__main__:Epoch: 4 | Total Loss: 1.15 | Balanced Accuracy: 0.33
INFO:__main__:Best Balanced Accuracy Seen, validation/test: 0.33 0.33
INFO:__main__:Epoch: 5 | Total Loss: 1.18 | Balanced Accuracy: 0.33
INFO:__main__:Best Balanced Accuracy Seen, validation/test: 0.33 0.33
INFO:__main__:Epoch: 6 | Total Loss: 1.21 | Balanced Accuracy: 0.33
INFO:__main__:Best Balanced Accuracy Seen, validation/test: 0.33 0.33
INFO:__main__:Epoch: 7 | Total Loss: 1.24 | Balanced Accuracy: 0.33
INFO:__main__:Best Balanced Accuracy Seen, validation/test: 0.33 0.33
INFO:__main__:Epoch: 8 | Total Loss: 1.27 | Balanced Accuracy: 0.33
INFO:__main__:Best Balanced Accuracy Seen, validation/test: 0.33 0.33
INFO:__main__:Epoch: 9 | Total Loss: 1.29 | Balanced Accuracy: 0.33
INFO:__main__:Best Balanced Accuracy Seen, validation/test: 0.33 0.33
INFO:__main__:Epoch: 10 | Total Loss: 1.32 | Balanced Accuracy: 0.33
INFO:__main__:Best Balanced Accuracy Seen, validation/test: 0.33 0.33
INFO:__main__:Epoch: 11 | Total Loss: 1.35 | Balanced Accuracy: 0.33
INFO:__main__:Best Balanced Accuracy Seen, validation/test: 0.33 0.33
INFO:__main__:Epoch: 12 | Total Loss: 1.38 | Balanced Accuracy: 0.33
INFO:__main__:Best Balanced Accuracy Seen, validation/test: 0.33 0.33
INFO:__main__:Epoch: 13 | Total Loss: 1.41 | Balanced Accuracy: 0.33
INFO:__main__:Best Balanced Accuracy Seen, validation/test: 0.33 0.33
INFO:__main__:Epoch: 14 | Total Loss: 1.44 | Balanced Accuracy: 0.33
INFO:__main__:Best Balanced Accuracy Seen, validation/test: 0.33 0.33
INFO:__main__:Epoch: 15 | Total Loss: 1.47 | Balanced Accuracy: 0.33
INFO:__main__:Best Balanced Accuracy Seen, validation/test: 0.33 0.33
INFO:__main__:Epoch: 16 | Total Loss: 1.50 | Balanced Accuracy: 0.33
INFO:__main__:Best Balanced Accuracy Seen, validation/test: 0.33 0.33
INFO:__main__:Epoch: 17 | Total Loss: 1.52 | Balanced Accuracy: 0.33
INFO:__main__:Best Balanced Accuracy Seen, validation/test: 0.33 0.33
INFO:__main__:Epoch: 18 | Total Loss: 1.54 | Balanced Accuracy: 0.33
INFO:__main__:Best Balanced Accuracy Seen, validation/test: 0.33 0.33
INFO:__main__:Epoch: 19 | Total Loss: 1.57 | Balanced Accuracy: 0.33
INFO:__main__:Best Balanced Accuracy Seen, validation/test: 0.33 0.33
INFO:__main__:Epoch: 20 | Total Loss: 1.60 | Balanced Accuracy: 0.33
INFO:__main__:Best Balanced Accuracy Seen, validation/test: 0.33 0.33
INFO:__main__:Epoch: 21 | Total Loss: 1.63 | Balanced Accuracy: 0.33
INFO:__main__:Best Balanced Accuracy Seen, validation/test: 0.33 0.33
INFO:__main__:Epoch: 22 | Total Loss: 1.65 | Balanced Accuracy: 0.33
INFO:__main__:Best Balanced Accuracy Seen, validation/test: 0.33 0.33
INFO:__main__:Epoch: 23 | Total Loss: 1.67 | Balanced Accuracy: 0.33
INFO:__main__:Best Balanced Accuracy Seen, validation/test: 0.33 0.33
INFO:__main__:Epoch: 24 | Total Loss: 1.69 | Balanced Accuracy: 0.33
INFO:__main__:Best Balanced Accuracy Seen, validation/test: 0.33 0.33
INFO:__main__:Epoch: 25 | Total Loss: 1.71 | Balanced Accuracy: 0.33
INFO:__main__:Best Balanced Accuracy Seen, validation/test: 0.33 0.33
INFO:__main__:Epoch: 26 | Total Loss: 1.70 | Balanced Accuracy: 0.33
INFO:__main__:Best Balanced Accuracy Seen, validation/test: 0.33 0.33
```













```
!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!counter: 0, score: 0.672875816993464, best_score: 0.672875816993464
INFO:__main__:Epoch: 204 | Total Loss: 0.72 | Balanced Accuracy: 0.57
INFO:__main__:Best Balanced Accuracy Seen, validation/test: 0.70 0.69
!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!counter: 1, score: 0.5729411764705882, best_score: 0.672875816993464
INFO:__main__:Epoch: 205 | Total Loss: 0.67 | Balanced Accuracy: 0.65
INFO:__main__:Best Balanced Accuracy Seen, validation/test: 0.70 0.69
!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!counter: 2, score: 0.6462091503267974, best_score: 0.672875816993464
INFO:__main__:Epoch: 206 | Total Loss: 0.69 | Balanced Accuracy: 0.61
INFO:__main__:Best Balanced Accuracy Seen, validation/test: 0.70 0.69
!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!counter: 3, score: 0.6126143790849673, best_score: 0.672875816993464
INFO:__main__:Epoch: 207 | Total Loss: 0.64 | Balanced Accuracy: 0.66
INFO:__main__:Best Balanced Accuracy Seen, validation/test: 0.70 0.69
!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!counter: 4, score: 0.6563398692810457, best_score: 0.672875816993464
INFO:__main__:Epoch: 208 | Total Loss: 0.63 | Balanced Accuracy: 0.63
INFO:__main__:Best Balanced Accuracy Seen, validation/test: 0.70 0.69
!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!counter: 5, score: 0.6256209150326798, best_score: 0.672875816993464
INFO:__main__:Epoch: 209 | Total Loss: 0.68 | Balanced Accuracy: 0.62
INFO:__main__:Best Balanced Accuracy Seen, validation/test: 0.70 0.69
!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!counter: 6, score: 0.6191503267973856, best_score: 0.672875816993464
INFO:__main__:Epoch: 210 | Total Loss: 0.68 | Balanced Accuracy: 0.60
INFO:__main__:Best Balanced Accuracy Seen, validation/test: 0.70 0.69
!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!counter: 7, score: 0.5960130718954249, best_score: 0.672875816993464
INFO:__main__:Epoch: 211 | Total Loss: 0.69 | Balanced Accuracy: 0.65
INFO:__main__:Best Balanced Accuracy Seen, validation/test: 0.70 0.69
!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!counter: 8, score: 0.6469934640522875, best_score: 0.672875816993464
INFO:__main__:Epoch: 212 | Total Loss: 0.63 | Balanced Accuracy: 0.52
INFO:__main__:Best Balanced Accuracy Seen, validation/test: 0.70 0.69
!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!counter: 9, score: 0.5247712418300653, best_score: 0.672875816993464
INFO:__main__:Epoch: 213 | Total Loss: 0.75 | Balanced Accuracy: 0.53
INFO:__main__:Best Balanced Accuracy Seen, validation/test: 0.70 0.69
!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!counter: 10, score: 0.5281699346405229, best_score: 0.672875816993464
INFO:__main__:Epoch: 214 | Total Loss: 0.72 | Balanced Accuracy: 0.45
INFO:__main__:Best Balanced Accuracy Seen, validation/test: 0.70 0.69
!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!counter: 11, score: 0.45169934640522874, best_score: 0.672875816993464
INFO:__main__:Epoch: 215 | Total Loss: 0.66 | Balanced Accuracy: 0.68
INFO:__main__:Best Balanced Accuracy Seen, validation/test: 0.70 0.69
!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!counter: 0, score: 0.6841176470588235, best_score: 0.6841176470588235
INFO:__main__:Epoch: 216 | Total Loss: 0.62 | Balanced Accuracy: 0.65
INFO:__main__:Best Balanced Accuracy Seen, validation/test: 0.70 0.69
!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!counter: 1, score: 0.6473856209150327, best_score: 0.6841176470588235
INFO:__main__:Epoch: 217 | Total Loss: 0.67 | Balanced Accuracy: 0.58
INFO:__main__:Best Balanced Accuracy Seen, validation/test: 0.70 0.69
```

```
!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!counter: 2, score: 0.5773856209150326, best_s
core: 0.6841176470588235
INFO:__main__:Epoch: 218 | Total Loss: 0.65 | Balanced Accuracy: 0.59
INFO:__main__:Best Balanced Accuracy Seen, validation/test: 0.70 0.69
!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!counter: 3, score: 0.591045751633987, best_sc
ore: 0.6841176470588235
INFO:__main__:Epoch: 219 | Total Loss: 0.66 | Balanced Accuracy: 0.57
INFO:__main__:Best Balanced Accuracy Seen, validation/test: 0.70 0.69
!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!counter: 4, score: 0.5719607843137254, best_s
core: 0.6841176470588235
INFO:__main__:Epoch: 220 | Total Loss: 0.61 | Balanced Accuracy: 0.62
INFO:__main__:Best Balanced Accuracy Seen, validation/test: 0.70 0.69
!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!counter: 5, score: 0.6223529411764707, best_s
core: 0.6841176470588235
INFO:__main__:Epoch: 221 | Total Loss: 0.61 | Balanced Accuracy: 0.67
INFO:__main__:Best Balanced Accuracy Seen, validation/test: 0.70 0.69
!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!counter: 6, score: 0.6688888888888888, best_s
core: 0.6841176470588235
INFO:__main__:Epoch: 222 | Total Loss: 0.66 | Balanced Accuracy: 0.53
INFO:__main__:Best Balanced Accuracy Seen, validation/test: 0.70 0.69
!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!counter: 7, score: 0.5307843137254902, best_s
core: 0.6841176470588235
INFO:__main__:Epoch: 223 | Total Loss: 0.69 | Balanced Accuracy: 0.64
INFO:__main__:Best Balanced Accuracy Seen, validation/test: 0.70 0.69
!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!counter: 8, score: 0.6358169934640523, best_s
core: 0.6841176470588235
INFO:__main__:Epoch: 224 | Total Loss: 0.58 | Balanced Accuracy: 0.63
INFO:__main__:Best Balanced Accuracy Seen, validation/test: 0.70 0.69
!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!counter: 9, score: 0.6277777777777778, best_s
core: 0.6841176470588235
INFO:__main__:Epoch: 225 | Total Loss: 0.66 | Balanced Accuracy: 0.64
INFO:__main__:Best Balanced Accuracy Seen, validation/test: 0.70 0.69
!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!counter: 10, score: 0.6443790849673202, best_
score: 0.6841176470588235
INFO:__main__:Epoch: 226 | Total Loss: 0.52 | Balanced Accuracy: 0.64
INFO:__main__:Best Balanced Accuracy Seen, validation/test: 0.70 0.69
!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!counter: 11, score: 0.6362745098039215, best_
score: 0.6841176470588235
INFO:__main__:Epoch: 227 | Total Loss: 0.63 | Balanced Accuracy: 0.67
INFO:__main__:Best Balanced Accuracy Seen, validation/test: 0.70 0.69
!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!counter: 12, score: 0.666078431372549, best_s
core: 0.6841176470588235
INFO:__main__:Epoch: 228 | Total Loss: 0.63 | Balanced Accuracy: 0.69
INFO:__main__:Best Balanced Accuracy Seen, validation/test: 0.70 0.69
!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!counter: 0, score: 0.6941830065359477, best_s
core: 0.6941830065359477
INFO:__main__:Epoch: 229 | Total Loss: 0.69 | Balanced Accuracy: 0.64
INFO:__main__:Best Balanced Accuracy Seen, validation/test: 0.70 0.69
!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!counter: 1, score: 0.6439869281045753, best_s
core: 0.6941830065359477
INFO:__main__:Epoch: 230 | Total Loss: 0.68 | Balanced Accuracy: 0.54
INFO:__main__:Best Balanced Accuracy Seen, validation/test: 0.70 0.69
!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!counter: 2, score: 0.5395424836601307, best_s
core: 0.6941830065359477
INFO:__main__:Epoch: 231 | Total Loss: 0.62 | Balanced Accuracy: 0.66
INFO:__main__:Best Balanced Accuracy Seen, validation/test: 0.70 0.69
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!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!counter: 3, score: 0.6592156862745098, best\_s  
core: 0.6941830065359477

INFO:\_\_main\_\_:Epoch: 232 | Total Loss: 0.56 | Balanced Accuracy: 0.70  
INFO:\_\_main\_\_:Best Balanced Accuracy Seen, validation/test: 0.70 0.69  
!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!counter: 0, score: 0.7013071895424837, best\_s  
core: 0.7013071895424837

INFO:\_\_main\_\_:Epoch: 233 | Total Loss: 0.69 | Balanced Accuracy: 0.52  
INFO:\_\_main\_\_:Best Balanced Accuracy Seen, validation/test: 0.70 0.69  
!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!counter: 1, score: 0.5194771241830066, best\_s  
core: 0.7013071895424837

INFO:\_\_main\_\_:Epoch: 234 | Total Loss: 0.58 | Balanced Accuracy: 0.47  
INFO:\_\_main\_\_:Best Balanced Accuracy Seen, validation/test: 0.70 0.69  
!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!counter: 2, score: 0.4749673202614379, best\_s  
core: 0.7013071895424837

INFO:\_\_main\_\_:Epoch: 235 | Total Loss: 0.61 | Balanced Accuracy: 0.68  
INFO:\_\_main\_\_:Best Balanced Accuracy Seen, validation/test: 0.70 0.69  
!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!counter: 3, score: 0.6768627450980391, best\_s  
core: 0.7013071895424837

INFO:\_\_main\_\_:Epoch: 236 | Total Loss: 0.59 | Balanced Accuracy: 0.61  
INFO:\_\_main\_\_:Best Balanced Accuracy Seen, validation/test: 0.70 0.69  
!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!counter: 4, score: 0.6082352941176471, best\_s  
core: 0.7013071895424837

INFO:\_\_main\_\_:Epoch: 237 | Total Loss: 0.68 | Balanced Accuracy: 0.62  
INFO:\_\_main\_\_:Best Balanced Accuracy Seen, validation/test: 0.70 0.69  
!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!counter: 5, score: 0.6187581699346406, best\_s  
core: 0.7013071895424837

INFO:\_\_main\_\_:Epoch: 238 | Total Loss: 0.61 | Balanced Accuracy: 0.69  
INFO:\_\_main\_\_:Best Balanced Accuracy Seen, validation/test: 0.70 0.69  
!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!counter: 6, score: 0.6906535947712419, best\_s  
core: 0.7013071895424837

INFO:\_\_main\_\_:Epoch: 239 | Total Loss: 0.56 | Balanced Accuracy: 0.65  
INFO:\_\_main\_\_:Best Balanced Accuracy Seen, validation/test: 0.70 0.69  
!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!counter: 7, score: 0.6486274509803921, best\_s  
core: 0.7013071895424837

INFO:\_\_main\_\_:Epoch: 240 | Total Loss: 0.56 | Balanced Accuracy: 0.65  
INFO:\_\_main\_\_:Best Balanced Accuracy Seen, validation/test: 0.70 0.69  
!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!counter: 8, score: 0.6458169934640523, best\_s  
core: 0.7013071895424837

INFO:\_\_main\_\_:Epoch: 241 | Total Loss: 0.65 | Balanced Accuracy: 0.62  
INFO:\_\_main\_\_:Best Balanced Accuracy Seen, validation/test: 0.70 0.69  
!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!counter: 9, score: 0.6248366013071895, best\_s  
core: 0.7013071895424837

INFO:\_\_main\_\_:Epoch: 242 | Total Loss: 0.58 | Balanced Accuracy: 0.68  
INFO:\_\_main\_\_:Best Balanced Accuracy Seen, validation/test: 0.70 0.69  
!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!counter: 10, score: 0.6800653594771241, best\_ score: 0.7013071895424837

INFO:\_\_main\_\_:Epoch: 243 | Total Loss: 0.62 | Balanced Accuracy: 0.56  
INFO:\_\_main\_\_:Best Balanced Accuracy Seen, validation/test: 0.70 0.69  
!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!counter: 11, score: 0.5564705882352942, best\_ score: 0.7013071895424837

INFO:\_\_main\_\_:Epoch: 244 | Total Loss: 0.67 | Balanced Accuracy: 0.60  
INFO:\_\_main\_\_:Best Balanced Accuracy Seen, validation/test: 0.70 0.69  
!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!counter: 12, score: 0.6007189542483661, best\_ score: 0.7013071895424837

INFO:\_\_main\_\_:Epoch: 245 | Total Loss: 0.58 | Balanced Accuracy: 0.61  
INFO:\_\_main\_\_:Best Balanced Accuracy Seen, validation/test: 0.70 0.69

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!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!counter: 13, score: 0.6052287581699346, best_
score: 0.7013071895424837
INFO:__main__:Epoch: 246 | Total Loss: 0.55 | Balanced Accuracy: 0.63
INFO:__main__:Best Balanced Accuracy Seen, validation/test: 0.70 0.69
!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!counter: 14, score: 0.6284967320261439, best_
score: 0.7013071895424837
INFO:__main__:Epoch: 247 | Total Loss: 0.62 | Balanced Accuracy: 0.56
INFO:__main__:Best Balanced Accuracy Seen, validation/test: 0.70 0.69
!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!counter: 15, score: 0.5626143790849674, best_
score: 0.7013071895424837
INFO:__main__:Epoch: 248 | Total Loss: 0.62 | Balanced Accuracy: 0.60
INFO:__main__:Best Balanced Accuracy Seen, validation/test: 0.70 0.69
!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!counter: 16, score: 0.5981699346405228, best_
score: 0.7013071895424837
INFO:__main__:Epoch: 249 | Total Loss: 0.65 | Balanced Accuracy: 0.55
INFO:__main__:Best Balanced Accuracy Seen, validation/test: 0.70 0.69
!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!counter: 17, score: 0.5490849673202615, best_
score: 0.7013071895424837
INFO:__main__:Epoch: 250 | Total Loss: 0.65 | Balanced Accuracy: 0.69
INFO:__main__:Best Balanced Accuracy Seen, validation/test: 0.70 0.69
!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!counter: 18, score: 0.6922222222222222, best_
score: 0.7013071895424837
INFO:__main__:Epoch: 251 | Total Loss: 0.58 | Balanced Accuracy: 0.61
INFO:__main__:Best Balanced Accuracy Seen, validation/test: 0.70 0.69
!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!counter: 19, score: 0.6131372549019608, best_
score: 0.7013071895424837
INFO:__main__:Epoch: 252 | Total Loss: 0.62 | Balanced Accuracy: 0.58
INFO:__main__:Best Balanced Accuracy Seen, validation/test: 0.70 0.69
!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!counter: 20, score: 0.5813725490196079, best_
score: 0.7013071895424837
INFO:__main__:Epoch: 253 | Total Loss: 0.63 | Balanced Accuracy: 0.67
INFO:__main__:Best Balanced Accuracy Seen, validation/test: 0.70 0.69
!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!counter: 21, score: 0.6656209150326798, best_
score: 0.7013071895424837
INFO:__main__:Epoch: 254 | Total Loss: 0.63 | Balanced Accuracy: 0.59
INFO:__main__:Best Balanced Accuracy Seen, validation/test: 0.70 0.69
!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!counter: 22, score: 0.5862091503267973, best_
score: 0.7013071895424837
INFO:__main__:Epoch: 255 | Total Loss: 0.59 | Balanced Accuracy: 0.63
INFO:__main__:Best Balanced Accuracy Seen, validation/test: 0.70 0.69
!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!counter: 23, score: 0.6258169934640523, best_
score: 0.7013071895424837
INFO:__main__:Epoch: 256 | Total Loss: 0.59 | Balanced Accuracy: 0.61
INFO:__main__:Best Balanced Accuracy Seen, validation/test: 0.70 0.69
!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!counter: 24, score: 0.6115032679738562, best_
score: 0.7013071895424837
INFO:__main__:Epoch: 257 | Total Loss: 0.58 | Balanced Accuracy: 0.63
INFO:__main__:Best Balanced Accuracy Seen, validation/test: 0.70 0.69
!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!counter: 25, score: 0.6320261437908496, best_
score: 0.7013071895424837
INFO:__main__:Epoch: 258 | Total Loss: 0.65 | Balanced Accuracy: 0.67
INFO:__main__:Best Balanced Accuracy Seen, validation/test: 0.70 0.69
!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!counter: 26, score: 0.6686928104575164, best_
score: 0.7013071895424837
INFO:__main__:Epoch: 259 | Total Loss: 0.59 | Balanced Accuracy: 0.62
INFO:__main__:Best Balanced Accuracy Seen, validation/test: 0.70 0.69
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!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!counter: 27, score: 0.6154248366013072, best_
score: 0.7013071895424837
INFO:__main__:Epoch: 260 | Total Loss: 0.65 | Balanced Accuracy: 0.59
INFO:__main__:Best Balanced Accuracy Seen, validation/test: 0.70 0.69
!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!counter: 28, score: 0.5936601307189543, best_
score: 0.7013071895424837
INFO:__main__:Epoch: 261 | Total Loss: 0.49 | Balanced Accuracy: 0.61
INFO:__main__:Best Balanced Accuracy Seen, validation/test: 0.70 0.69
!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!counter: 29, score: 0.6140522875816993, best_
score: 0.7013071895424837
INFO:__main__:Epoch: 262 | Total Loss: 0.60 | Balanced Accuracy: 0.66
INFO:__main__:Best Balanced Accuracy Seen, validation/test: 0.70 0.69
!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!counter: 30, score: 0.6603921568627451, best_
score: 0.7013071895424837
INFO:__main__:Epoch: 263 | Total Loss: 0.60 | Balanced Accuracy: 0.64
INFO:__main__:Best Balanced Accuracy Seen, validation/test: 0.70 0.69
!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!counter: 31, score: 0.6443137254901962, best_
score: 0.7013071895424837
INFO:__main__:Epoch: 264 | Total Loss: 0.53 | Balanced Accuracy: 0.66
INFO:__main__:Best Balanced Accuracy Seen, validation/test: 0.70 0.69
!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!counter: 32, score: 0.6642483660130719, best_
score: 0.7013071895424837
INFO:__main__:Epoch: 265 | Total Loss: 0.51 | Balanced Accuracy: 0.70
INFO:__main__:Best Balanced Accuracy Seen, validation/test: 0.70 0.69
!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!counter: 0, score: 0.7016993464052287, best_s
core: 0.7016993464052287
INFO:__main__:Epoch: 266 | Total Loss: 0.53 | Balanced Accuracy: 0.69
INFO:__main__:Best Balanced Accuracy Seen, validation/test: 0.70 0.69
!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!counter: 1, score: 0.686078431372549, best_sc
ore: 0.7016993464052287
INFO:__main__:Epoch: 267 | Total Loss: 0.50 | Balanced Accuracy: 0.62
INFO:__main__:Best Balanced Accuracy Seen, validation/test: 0.70 0.69
!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!counter: 2, score: 0.6179738562091504, best_s
core: 0.7016993464052287
INFO:__main__:Epoch: 268 | Total Loss: 0.63 | Balanced Accuracy: 0.64
INFO:__main__:Best Balanced Accuracy Seen, validation/test: 0.70 0.69
!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!counter: 3, score: 0.6384313725490196, best_s
core: 0.7016993464052287
INFO:__main__:Epoch: 269 | Total Loss: 0.57 | Balanced Accuracy: 0.67
INFO:__main__:Best Balanced Accuracy Seen, validation/test: 0.70 0.69
!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!counter: 4, score: 0.6670588235294117, best_s
core: 0.7016993464052287
INFO:__main__:Epoch: 270 | Total Loss: 0.64 | Balanced Accuracy: 0.65
INFO:__main__:Best Balanced Accuracy Seen, validation/test: 0.70 0.69
!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!counter: 5, score: 0.6544444444444445, best_s
core: 0.7016993464052287
INFO:__main__:Epoch: 271 | Total Loss: 0.57 | Balanced Accuracy: 0.60
INFO:__main__:Best Balanced Accuracy Seen, validation/test: 0.70 0.69
!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!counter: 6, score: 0.6007189542483661, best_s
core: 0.7016993464052287
INFO:__main__:Epoch: 272 | Total Loss: 0.54 | Balanced Accuracy: 0.67
INFO:__main__:Best Balanced Accuracy Seen, validation/test: 0.70 0.69
!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!counter: 7, score: 0.6652287581699347, best_s
core: 0.7016993464052287
INFO:__main__:Epoch: 273 | Total Loss: 0.60 | Balanced Accuracy: 0.64
INFO:__main__:Best Balanced Accuracy Seen, validation/test: 0.70 0.69
```

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!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!counter: 8, score: 0.6413071895424837, best_s
core: 0.7016993464052287
INFO:__main__:Epoch: 274 | Total Loss: 0.58 | Balanced Accuracy: 0.72
INFO:__main__:Best Balanced Accuracy Seen, validation/test: 0.72 0.71
!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!counter: 0, score: 0.7247712418300654, best_s
core: 0.7247712418300654
INFO:__main__:Epoch: 275 | Total Loss: 0.60 | Balanced Accuracy: 0.69
INFO:__main__:Best Balanced Accuracy Seen, validation/test: 0.72 0.71
!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!counter: 1, score: 0.6911111111111111, best_s
core: 0.7247712418300654
INFO:__main__:Epoch: 276 | Total Loss: 0.57 | Balanced Accuracy: 0.64
INFO:__main__:Best Balanced Accuracy Seen, validation/test: 0.72 0.71
!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!counter: 2, score: 0.6441176470588236, best_s
core: 0.7247712418300654
INFO:__main__:Epoch: 277 | Total Loss: 0.54 | Balanced Accuracy: 0.69
INFO:__main__:Best Balanced Accuracy Seen, validation/test: 0.72 0.71
!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!counter: 3, score: 0.6926143790849674, best_s
core: 0.7247712418300654
INFO:__main__:Epoch: 278 | Total Loss: 0.68 | Balanced Accuracy: 0.61
INFO:__main__:Best Balanced Accuracy Seen, validation/test: 0.72 0.71
!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!counter: 4, score: 0.6145098039215686, best_s
core: 0.7247712418300654
INFO:__main__:Epoch: 279 | Total Loss: 0.70 | Balanced Accuracy: 0.64
INFO:__main__:Best Balanced Accuracy Seen, validation/test: 0.72 0.71
!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!counter: 5, score: 0.6420261437908498, best_s
core: 0.7247712418300654
INFO:__main__:Epoch: 280 | Total Loss: 0.61 | Balanced Accuracy: 0.66
INFO:__main__:Best Balanced Accuracy Seen, validation/test: 0.72 0.71
!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!counter: 6, score: 0.6615032679738562, best_s
core: 0.7247712418300654
INFO:__main__:Epoch: 281 | Total Loss: 0.59 | Balanced Accuracy: 0.71
INFO:__main__:Best Balanced Accuracy Seen, validation/test: 0.72 0.71
!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!counter: 7, score: 0.7051633986928105, best_s
core: 0.7247712418300654
INFO:__main__:Epoch: 282 | Total Loss: 0.55 | Balanced Accuracy: 0.57
INFO:__main__:Best Balanced Accuracy Seen, validation/test: 0.72 0.71
!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!counter: 8, score: 0.5653594771241831, best_s
core: 0.7247712418300654
INFO:__main__:Epoch: 283 | Total Loss: 0.51 | Balanced Accuracy: 0.65
INFO:__main__:Best Balanced Accuracy Seen, validation/test: 0.72 0.71
!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!counter: 9, score: 0.6488888888888889, best_sc
ore: 0.7247712418300654
INFO:__main__:Epoch: 284 | Total Loss: 0.56 | Balanced Accuracy: 0.67
INFO:__main__:Best Balanced Accuracy Seen, validation/test: 0.72 0.71
!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!counter: 10, score: 0.6688888888888888, best_
score: 0.7247712418300654
INFO:__main__:Epoch: 285 | Total Loss: 0.54 | Balanced Accuracy: 0.67
INFO:__main__:Best Balanced Accuracy Seen, validation/test: 0.72 0.71
!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!counter: 11, score: 0.6650326797385621, best_
score: 0.7247712418300654
INFO:__main__:Epoch: 286 | Total Loss: 0.54 | Balanced Accuracy: 0.66
INFO:__main__:Best Balanced Accuracy Seen, validation/test: 0.72 0.71
!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!counter: 12, score: 0.6562745098039215, best_
score: 0.7247712418300654
INFO:__main__:Epoch: 287 | Total Loss: 0.52 | Balanced Accuracy: 0.59
INFO:__main__:Best Balanced Accuracy Seen, validation/test: 0.72 0.71
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!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!counter: 13, score: 0.586797385620915, best_s
core: 0.7247712418300654
INFO:__main__:Epoch: 288 | Total Loss: 0.57 | Balanced Accuracy: 0.69
INFO:__main__:Best Balanced Accuracy Seen, validation/test: 0.72 0.71
!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!counter: 14, score: 0.6920261437908497, best_
score: 0.7247712418300654
INFO:__main__:Epoch: 289 | Total Loss: 0.55 | Balanced Accuracy: 0.58
INFO:__main__:Best Balanced Accuracy Seen, validation/test: 0.72 0.71
!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!counter: 15, score: 0.579673202614379, best_s
core: 0.7247712418300654
INFO:__main__:Epoch: 290 | Total Loss: 0.56 | Balanced Accuracy: 0.64
INFO:__main__:Best Balanced Accuracy Seen, validation/test: 0.72 0.71
!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!counter: 16, score: 0.641437908496732, best_s
core: 0.7247712418300654
INFO:__main__:Epoch: 291 | Total Loss: 0.59 | Balanced Accuracy: 0.72
INFO:__main__:Best Balanced Accuracy Seen, validation/test: 0.72 0.71
!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!counter: 17, score: 0.7159477124183007, best_
score: 0.7247712418300654
INFO:__main__:Epoch: 292 | Total Loss: 0.59 | Balanced Accuracy: 0.70
INFO:__main__:Best Balanced Accuracy Seen, validation/test: 0.72 0.71
!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!counter: 18, score: 0.6994117647058823, best_
score: 0.7247712418300654
INFO:__main__:Epoch: 293 | Total Loss: 0.54 | Balanced Accuracy: 0.64
INFO:__main__:Best Balanced Accuracy Seen, validation/test: 0.72 0.71
!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!counter: 19, score: 0.6440522875816993, best_
score: 0.7247712418300654
INFO:__main__:Epoch: 294 | Total Loss: 0.59 | Balanced Accuracy: 0.67
INFO:__main__:Best Balanced Accuracy Seen, validation/test: 0.72 0.71
!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!counter: 20, score: 0.6675163398692812, best_
score: 0.7247712418300654
INFO:__main__:Epoch: 295 | Total Loss: 0.47 | Balanced Accuracy: 0.70
INFO:__main__:Best Balanced Accuracy Seen, validation/test: 0.72 0.71
!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!counter: 21, score: 0.69718954248366, best_sc
ore: 0.7247712418300654
INFO:__main__:Epoch: 296 | Total Loss: 0.48 | Balanced Accuracy: 0.66
INFO:__main__:Best Balanced Accuracy Seen, validation/test: 0.72 0.71
!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!counter: 22, score: 0.6641176470588235, best_
score: 0.7247712418300654
INFO:__main__:Epoch: 297 | Total Loss: 0.62 | Balanced Accuracy: 0.70
INFO:__main__:Best Balanced Accuracy Seen, validation/test: 0.72 0.71
!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!counter: 23, score: 0.6984967320261438, best_
score: 0.7247712418300654
INFO:__main__:Epoch: 298 | Total Loss: 0.52 | Balanced Accuracy: 0.67
INFO:__main__:Best Balanced Accuracy Seen, validation/test: 0.72 0.71
!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!counter: 24, score: 0.674640522875817, best_s
core: 0.7247712418300654
INFO:__main__:Epoch: 299 | Total Loss: 0.65 | Balanced Accuracy: 0.67
INFO:__main__:Best Balanced Accuracy Seen, validation/test: 0.72 0.71
!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!counter: 25, score: 0.666078431372549, best_s
core: 0.7247712418300654
INFO:__main__:Epoch: 300 | Total Loss: 0.57 | Balanced Accuracy: 0.62
INFO:__main__:Best Balanced Accuracy Seen, validation/test: 0.72 0.71
!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!counter: 26, score: 0.6203267973856209, best_
score: 0.7247712418300654
INFO:__main__:Epoch: 301 | Total Loss: 0.46 | Balanced Accuracy: 0.71
INFO:__main__:Best Balanced Accuracy Seen, validation/test: 0.72 0.71
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!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!counter: 27, score: 0.7107189542483661, best_
score: 0.7247712418300654
INFO:__main__:Epoch: 302 | Total Loss: 0.64 | Balanced Accuracy: 0.59
INFO:__main__:Best Balanced Accuracy Seen, validation/test: 0.72 0.71
!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!counter: 28, score: 0.5922875816993464, best_
score: 0.7247712418300654
INFO:__main__:Epoch: 303 | Total Loss: 0.59 | Balanced Accuracy: 0.70
INFO:__main__:Best Balanced Accuracy Seen, validation/test: 0.72 0.71
!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!counter: 29, score: 0.6960784313725489, best_
score: 0.7247712418300654
INFO:__main__:Epoch: 304 | Total Loss: 0.59 | Balanced Accuracy: 0.64
INFO:__main__:Best Balanced Accuracy Seen, validation/test: 0.72 0.71
!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!counter: 30, score: 0.6364705882352941, best_
score: 0.7247712418300654
INFO:__main__:Epoch: 305 | Total Loss: 0.59 | Balanced Accuracy: 0.58
INFO:__main__:Best Balanced Accuracy Seen, validation/test: 0.72 0.71
!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!counter: 31, score: 0.5783006535947712, best_
score: 0.7247712418300654
INFO:__main__:Epoch: 306 | Total Loss: 0.61 | Balanced Accuracy: 0.65
INFO:__main__:Best Balanced Accuracy Seen, validation/test: 0.72 0.71
!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!counter: 32, score: 0.6510457516339869, best_
score: 0.7247712418300654
INFO:__main__:Epoch: 307 | Total Loss: 0.53 | Balanced Accuracy: 0.75
INFO:__main__:Best Balanced Accuracy Seen, validation/test: 0.75 0.71
!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!counter: 0, score: 0.7477124183006536, best_s
core: 0.7477124183006536
INFO:__main__:Epoch: 308 | Total Loss: 0.60 | Balanced Accuracy: 0.68
INFO:__main__:Best Balanced Accuracy Seen, validation/test: 0.75 0.71
!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!counter: 1, score: 0.6811111111111111, best_s
core: 0.7477124183006536
INFO:__main__:Epoch: 309 | Total Loss: 0.51 | Balanced Accuracy: 0.66
INFO:__main__:Best Balanced Accuracy Seen, validation/test: 0.75 0.71
!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!counter: 2, score: 0.6562745098039215, best_s
core: 0.7477124183006536
INFO:__main__:Epoch: 310 | Total Loss: 0.63 | Balanced Accuracy: 0.65
INFO:__main__:Best Balanced Accuracy Seen, validation/test: 0.75 0.71
!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!counter: 3, score: 0.6544444444444445, best_s
core: 0.7477124183006536
INFO:__main__:Epoch: 311 | Total Loss: 0.61 | Balanced Accuracy: 0.72
INFO:__main__:Best Balanced Accuracy Seen, validation/test: 0.75 0.71
!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!counter: 4, score: 0.7186274509803922, best_s
core: 0.7477124183006536
INFO:__main__:Epoch: 312 | Total Loss: 0.64 | Balanced Accuracy: 0.61
INFO:__main__:Best Balanced Accuracy Seen, validation/test: 0.75 0.71
!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!counter: 5, score: 0.6134640522875817, best_s
core: 0.7477124183006536
INFO:__main__:Epoch: 313 | Total Loss: 0.56 | Balanced Accuracy: 0.73
INFO:__main__:Best Balanced Accuracy Seen, validation/test: 0.75 0.71
!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!counter: 6, score: 0.7326797385620916, best_s
core: 0.7477124183006536
INFO:__main__:Epoch: 314 | Total Loss: 0.49 | Balanced Accuracy: 0.59
INFO:__main__:Best Balanced Accuracy Seen, validation/test: 0.75 0.71
!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!counter: 7, score: 0.5884967320261438, best_s
core: 0.7477124183006536
INFO:__main__:Epoch: 315 | Total Loss: 0.46 | Balanced Accuracy: 0.56
INFO:__main__:Best Balanced Accuracy Seen, validation/test: 0.75 0.71
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!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!counter: 8, score: 0.561111111111111, best_s
core: 0.7477124183006536
INFO:__main__:Epoch: 316 | Total Loss: 0.51 | Balanced Accuracy: 0.67
INFO:__main__:Best Balanced Accuracy Seen, validation/test: 0.75 0.71
!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!counter: 9, score: 0.6677777777777778, best_s
core: 0.7477124183006536
INFO:__main__:Epoch: 317 | Total Loss: 0.74 | Balanced Accuracy: 0.52
INFO:__main__:Best Balanced Accuracy Seen, validation/test: 0.75 0.71
!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!counter: 10, score: 0.5245098039215687, best_
score: 0.7477124183006536
INFO:__main__:Epoch: 318 | Total Loss: 0.60 | Balanced Accuracy: 0.61
INFO:__main__:Best Balanced Accuracy Seen, validation/test: 0.75 0.71
!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!counter: 11, score: 0.6099346405228758, best_
score: 0.7477124183006536
INFO:__main__:Epoch: 319 | Total Loss: 0.52 | Balanced Accuracy: 0.70
INFO:__main__:Best Balanced Accuracy Seen, validation/test: 0.75 0.71
!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!counter: 12, score: 0.701437908496732, best_s
core: 0.7477124183006536
INFO:__main__:Epoch: 320 | Total Loss: 0.61 | Balanced Accuracy: 0.63
INFO:__main__:Best Balanced Accuracy Seen, validation/test: 0.75 0.71
!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!counter: 13, score: 0.6311764705882353, best_
score: 0.7477124183006536
INFO:__main__:Epoch: 321 | Total Loss: 0.59 | Balanced Accuracy: 0.57
INFO:__main__:Best Balanced Accuracy Seen, validation/test: 0.75 0.71
!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!counter: 14, score: 0.5703267973856209, best_
score: 0.7477124183006536
INFO:__main__:Epoch: 322 | Total Loss: 0.58 | Balanced Accuracy: 0.66
INFO:__main__:Best Balanced Accuracy Seen, validation/test: 0.75 0.71
!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!counter: 15, score: 0.6620915032679738, best_
score: 0.7477124183006536
INFO:__main__:Epoch: 323 | Total Loss: 0.60 | Balanced Accuracy: 0.60
INFO:__main__:Best Balanced Accuracy Seen, validation/test: 0.75 0.71
!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!counter: 16, score: 0.603202614379085, best_s
core: 0.7477124183006536
INFO:__main__:Epoch: 324 | Total Loss: 0.49 | Balanced Accuracy: 0.57
INFO:__main__:Best Balanced Accuracy Seen, validation/test: 0.75 0.71
!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!counter: 17, score: 0.5659477124183007, best_
score: 0.7477124183006536
INFO:__main__:Epoch: 325 | Total Loss: 0.52 | Balanced Accuracy: 0.73
INFO:__main__:Best Balanced Accuracy Seen, validation/test: 0.75 0.71
!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!counter: 18, score: 0.7273856209150327, best_
score: 0.7477124183006536
INFO:__main__:Epoch: 326 | Total Loss: 0.57 | Balanced Accuracy: 0.74
INFO:__main__:Best Balanced Accuracy Seen, validation/test: 0.75 0.71
!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!counter: 19, score: 0.7427450980392157, best_
score: 0.7477124183006536
INFO:__main__:Epoch: 327 | Total Loss: 0.63 | Balanced Accuracy: 0.60
INFO:__main__:Best Balanced Accuracy Seen, validation/test: 0.75 0.71
!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!counter: 20, score: 0.6043790849673202, best_
score: 0.7477124183006536
INFO:__main__:Epoch: 328 | Total Loss: 0.49 | Balanced Accuracy: 0.69
INFO:__main__:Best Balanced Accuracy Seen, validation/test: 0.75 0.71
!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!counter: 21, score: 0.6925490196078431, best_
score: 0.7477124183006536
INFO:__main__:Epoch: 329 | Total Loss: 0.56 | Balanced Accuracy: 0.67
INFO:__main__:Best Balanced Accuracy Seen, validation/test: 0.75 0.71
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!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!counter: 22, score: 0.6666013071895426, best\_score: 0.7477124183006536

INFO:\_\_main\_\_:Epoch: 330 | Total Loss: 0.50 | Balanced Accuracy: 0.67  
INFO:\_\_main\_\_:Best Balanced Accuracy Seen, validation/test: 0.75 0.71  
!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!counter: 23, score: 0.6733333333333333, best\_score: 0.7477124183006536

INFO:\_\_main\_\_:Epoch: 331 | Total Loss: 0.55 | Balanced Accuracy: 0.68  
INFO:\_\_main\_\_:Best Balanced Accuracy Seen, validation/test: 0.75 0.71  
!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!counter: 24, score: 0.6813071895424837, best\_score: 0.7477124183006536

INFO:\_\_main\_\_:Epoch: 332 | Total Loss: 0.68 | Balanced Accuracy: 0.61  
INFO:\_\_main\_\_:Best Balanced Accuracy Seen, validation/test: 0.75 0.71  
!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!counter: 25, score: 0.605032679738562, best\_score: 0.7477124183006536

INFO:\_\_main\_\_:Epoch: 333 | Total Loss: 0.57 | Balanced Accuracy: 0.67  
INFO:\_\_main\_\_:Best Balanced Accuracy Seen, validation/test: 0.75 0.71  
!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!counter: 26, score: 0.6718954248366013, best\_score: 0.7477124183006536

INFO:\_\_main\_\_:Epoch: 334 | Total Loss: 0.58 | Balanced Accuracy: 0.65  
INFO:\_\_main\_\_:Best Balanced Accuracy Seen, validation/test: 0.75 0.71  
!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!counter: 27, score: 0.6520915032679738, best\_score: 0.7477124183006536

INFO:\_\_main\_\_:Epoch: 335 | Total Loss: 0.56 | Balanced Accuracy: 0.56  
INFO:\_\_main\_\_:Best Balanced Accuracy Seen, validation/test: 0.75 0.71  
!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!counter: 28, score: 0.5598692810457516, best\_score: 0.7477124183006536

INFO:\_\_main\_\_:Epoch: 336 | Total Loss: 0.54 | Balanced Accuracy: 0.66  
INFO:\_\_main\_\_:Best Balanced Accuracy Seen, validation/test: 0.75 0.71  
!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!counter: 29, score: 0.6623529411764706, best\_score: 0.7477124183006536

INFO:\_\_main\_\_:Epoch: 337 | Total Loss: 0.57 | Balanced Accuracy: 0.60  
INFO:\_\_main\_\_:Best Balanced Accuracy Seen, validation/test: 0.75 0.71  
!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!counter: 30, score: 0.6026797385620916, best\_score: 0.7477124183006536

INFO:\_\_main\_\_:Epoch: 338 | Total Loss: 0.51 | Balanced Accuracy: 0.62  
INFO:\_\_main\_\_:Best Balanced Accuracy Seen, validation/test: 0.75 0.71  
!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!counter: 31, score: 0.6178431372549019, best\_score: 0.7477124183006536

INFO:\_\_main\_\_:Epoch: 339 | Total Loss: 0.52 | Balanced Accuracy: 0.69  
INFO:\_\_main\_\_:Best Balanced Accuracy Seen, validation/test: 0.75 0.71  
!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!counter: 32, score: 0.6898039215686275, best\_score: 0.7477124183006536

INFO:\_\_main\_\_:Epoch: 340 | Total Loss: 0.60 | Balanced Accuracy: 0.66  
INFO:\_\_main\_\_:Best Balanced Accuracy Seen, validation/test: 0.75 0.71  
!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!counter: 33, score: 0.664640522875817, best\_score: 0.7477124183006536

INFO:\_\_main\_\_:Epoch: 341 | Total Loss: 0.55 | Balanced Accuracy: 0.70  
INFO:\_\_main\_\_:Best Balanced Accuracy Seen, validation/test: 0.75 0.71  
!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!counter: 34, score: 0.6968627450980392, best\_score: 0.7477124183006536

INFO:\_\_main\_\_:Epoch: 342 | Total Loss: 0.65 | Balanced Accuracy: 0.69  
INFO:\_\_main\_\_:Best Balanced Accuracy Seen, validation/test: 0.75 0.71  
!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!counter: 35, score: 0.6890849673202615, best\_score: 0.7477124183006536

INFO:\_\_main\_\_:Epoch: 343 | Total Loss: 0.58 | Balanced Accuracy: 0.58  
INFO:\_\_main\_\_:Best Balanced Accuracy Seen, validation/test: 0.75 0.71

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!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!counter: 36, score: 0.5806535947712418, best_
score: 0.7477124183006536
INFO:__main__:Epoch: 344 | Total Loss: 0.56 | Balanced Accuracy: 0.70
INFO:__main__:Best Balanced Accuracy Seen, validation/test: 0.75 0.71
!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!counter: 37, score: 0.7024183006535948, best_
score: 0.7477124183006536
INFO:__main__:Epoch: 345 | Total Loss: 0.59 | Balanced Accuracy: 0.66
INFO:__main__:Best Balanced Accuracy Seen, validation/test: 0.75 0.71
!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!counter: 38, score: 0.6558169934640522, best_
score: 0.7477124183006536
INFO:__main__:Epoch: 346 | Total Loss: 0.63 | Balanced Accuracy: 0.61
INFO:__main__:Best Balanced Accuracy Seen, validation/test: 0.75 0.71
!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!counter: 39, score: 0.6112418300653594, best_
score: 0.7477124183006536
INFO:__main__:Epoch: 347 | Total Loss: 0.56 | Balanced Accuracy: 0.71
INFO:__main__:Best Balanced Accuracy Seen, validation/test: 0.75 0.71
!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!counter: 40, score: 0.7062091503267974, best_
score: 0.7477124183006536
INFO:__main__:Epoch: 348 | Total Loss: 0.63 | Balanced Accuracy: 0.67
INFO:__main__:Best Balanced Accuracy Seen, validation/test: 0.75 0.71
!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!counter: 41, score: 0.6741176470588236, best_
score: 0.7477124183006536
INFO:__main__:Epoch: 349 | Total Loss: 0.48 | Balanced Accuracy: 0.70
INFO:__main__:Best Balanced Accuracy Seen, validation/test: 0.75 0.71
!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!counter: 42, score: 0.6983660130718955, best_
score: 0.7477124183006536
INFO:__main__:Epoch: 350 | Total Loss: 0.52 | Balanced Accuracy: 0.63
INFO:__main__:Best Balanced Accuracy Seen, validation/test: 0.75 0.71
!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!counter: 43, score: 0.6330065359477124, best_
score: 0.7477124183006536
INFO:__main__:Epoch: 351 | Total Loss: 0.52 | Balanced Accuracy: 0.68
INFO:__main__:Best Balanced Accuracy Seen, validation/test: 0.75 0.71
!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!counter: 44, score: 0.680392156862745, best_s
core: 0.7477124183006536
INFO:__main__:Epoch: 352 | Total Loss: 0.63 | Balanced Accuracy: 0.65
INFO:__main__:Best Balanced Accuracy Seen, validation/test: 0.75 0.71
!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!counter: 45, score: 0.6541830065359476, best_
score: 0.7477124183006536
INFO:__main__:Epoch: 353 | Total Loss: 0.54 | Balanced Accuracy: 0.64
INFO:__main__:Best Balanced Accuracy Seen, validation/test: 0.75 0.71
!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!counter: 46, score: 0.6393464052287582, best_
score: 0.7477124183006536
INFO:__main__:Epoch: 354 | Total Loss: 0.55 | Balanced Accuracy: 0.69
INFO:__main__:Best Balanced Accuracy Seen, validation/test: 0.75 0.71
!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!counter: 47, score: 0.6872549019607844, best_
score: 0.7477124183006536
INFO:__main__:Epoch: 355 | Total Loss: 0.59 | Balanced Accuracy: 0.62
INFO:__main__:Best Balanced Accuracy Seen, validation/test: 0.75 0.71
!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!counter: 48, score: 0.6224183006535947, best_
score: 0.7477124183006536
INFO:__main__:Epoch: 356 | Total Loss: 0.52 | Balanced Accuracy: 0.64
INFO:__main__:Best Balanced Accuracy Seen, validation/test: 0.75 0.71
!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!counter: 49, score: 0.6411111111111111, best_
score: 0.7477124183006536
INFO:__main__:Epoch: 357 | Total Loss: 0.51 | Balanced Accuracy: 0.60
INFO:__main__:Best Balanced Accuracy Seen, validation/test: 0.75 0.71
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!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!counter: 50, score: 0.5957516339869281, best_
score: 0.7477124183006536
INFO:__main__:Epoch: 358 | Total Loss: 0.58 | Balanced Accuracy: 0.61
INFO:__main__:Best Balanced Accuracy Seen, validation/test: 0.75 0.71
!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!counter: 51, score: 0.6143137254901961, best_
score: 0.7477124183006536
INFO:__main__:Epoch: 359 | Total Loss: 0.60 | Balanced Accuracy: 0.58
INFO:__main__:Best Balanced Accuracy Seen, validation/test: 0.75 0.71
!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!counter: 52, score: 0.5751633986928105, best_
score: 0.7477124183006536
INFO:__main__:Epoch: 360 | Total Loss: 0.58 | Balanced Accuracy: 0.59
INFO:__main__:Best Balanced Accuracy Seen, validation/test: 0.75 0.71
!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!counter: 53, score: 0.592156862745098, best_s
core: 0.7477124183006536
INFO:__main__:Epoch: 361 | Total Loss: 0.50 | Balanced Accuracy: 0.69
INFO:__main__:Best Balanced Accuracy Seen, validation/test: 0.75 0.71
!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!counter: 54, score: 0.6949019607843137, best_
score: 0.7477124183006536
INFO:__main__:Epoch: 362 | Total Loss: 0.55 | Balanced Accuracy: 0.66
INFO:__main__:Best Balanced Accuracy Seen, validation/test: 0.75 0.71
!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!counter: 55, score: 0.658235294117647, best_s
core: 0.7477124183006536
INFO:__main__:Epoch: 363 | Total Loss: 0.54 | Balanced Accuracy: 0.64
INFO:__main__:Best Balanced Accuracy Seen, validation/test: 0.75 0.71
!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!counter: 56, score: 0.6381699346405229, best_
score: 0.7477124183006536
INFO:__main__:Epoch: 364 | Total Loss: 0.55 | Balanced Accuracy: 0.67
INFO:__main__:Best Balanced Accuracy Seen, validation/test: 0.75 0.71
!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!counter: 57, score: 0.6652941176470589, best_
score: 0.7477124183006536
INFO:__main__:Epoch: 365 | Total Loss: 0.58 | Balanced Accuracy: 0.61
INFO:__main__:Best Balanced Accuracy Seen, validation/test: 0.75 0.71
!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!counter: 58, score: 0.6066666666666667, best_
score: 0.7477124183006536
INFO:__main__:Epoch: 366 | Total Loss: 0.55 | Balanced Accuracy: 0.73
INFO:__main__:Best Balanced Accuracy Seen, validation/test: 0.75 0.71
!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!counter: 59, score: 0.7290196078431372, best_
score: 0.7477124183006536
INFO:__main__:Epoch: 367 | Total Loss: 0.52 | Balanced Accuracy: 0.62
INFO:__main__:Best Balanced Accuracy Seen, validation/test: 0.75 0.71
!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!counter: 60, score: 0.6223529411764706, best_
score: 0.7477124183006536
INFO:__main__:Epoch: 368 | Total Loss: 0.48 | Balanced Accuracy: 0.64
INFO:__main__:Best Balanced Accuracy Seen, validation/test: 0.75 0.71
!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!counter: 61, score: 0.6415032679738562, best_
score: 0.7477124183006536
INFO:__main__:Epoch: 369 | Total Loss: 0.60 | Balanced Accuracy: 0.62
INFO:__main__:Best Balanced Accuracy Seen, validation/test: 0.75 0.71
!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!counter: 62, score: 0.6173202614379085, best_
score: 0.7477124183006536
INFO:__main__:Epoch: 370 | Total Loss: 0.57 | Balanced Accuracy: 0.73
INFO:__main__:Best Balanced Accuracy Seen, validation/test: 0.75 0.71
!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!counter: 63, score: 0.731045751633987, best_s
core: 0.7477124183006536
INFO:__main__:Epoch: 371 | Total Loss: 0.46 | Balanced Accuracy: 0.70
INFO:__main__:Best Balanced Accuracy Seen, validation/test: 0.75 0.71
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!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!counter: 64, score: 0.701437908496732, best_s
core: 0.7477124183006536
INFO:__main__:Epoch: 372 | Total Loss: 0.62 | Balanced Accuracy: 0.61
INFO:__main__:Best Balanced Accuracy Seen, validation/test: 0.75 0.71
!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!counter: 65, score: 0.6141176470588235, best_
score: 0.7477124183006536
INFO:__main__:Epoch: 373 | Total Loss: 0.67 | Balanced Accuracy: 0.66
INFO:__main__:Best Balanced Accuracy Seen, validation/test: 0.75 0.71
!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!counter: 66, score: 0.6620915032679738, best_
score: 0.7477124183006536
INFO:__main__:Epoch: 374 | Total Loss: 0.61 | Balanced Accuracy: 0.65
INFO:__main__:Best Balanced Accuracy Seen, validation/test: 0.75 0.71
!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!counter: 67, score: 0.6524183006535947, best_
score: 0.7477124183006536
INFO:__main__:Epoch: 375 | Total Loss: 0.53 | Balanced Accuracy: 0.57
INFO:__main__:Best Balanced Accuracy Seen, validation/test: 0.75 0.71
!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!counter: 68, score: 0.5711111111111111, best_
score: 0.7477124183006536
INFO:__main__:Epoch: 376 | Total Loss: 0.49 | Balanced Accuracy: 0.61
INFO:__main__:Best Balanced Accuracy Seen, validation/test: 0.75 0.71
!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!counter: 69, score: 0.6131372549019608, best_
score: 0.7477124183006536
INFO:__main__:Epoch: 377 | Total Loss: 0.53 | Balanced Accuracy: 0.66
INFO:__main__:Best Balanced Accuracy Seen, validation/test: 0.75 0.71
!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!counter: 70, score: 0.6586928104575164, best_
score: 0.7477124183006536
INFO:__main__:Epoch: 378 | Total Loss: 0.57 | Balanced Accuracy: 0.60
INFO:__main__:Best Balanced Accuracy Seen, validation/test: 0.75 0.71
!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!counter: 71, score: 0.5989542483660131, best_
score: 0.7477124183006536
INFO:__main__:Epoch: 379 | Total Loss: 0.49 | Balanced Accuracy: 0.64
INFO:__main__:Best Balanced Accuracy Seen, validation/test: 0.75 0.71
!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!counter: 72, score: 0.6409803921568628, best_
score: 0.7477124183006536
INFO:__main__:Epoch: 380 | Total Loss: 0.57 | Balanced Accuracy: 0.66
INFO:__main__:Best Balanced Accuracy Seen, validation/test: 0.75 0.71
!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!counter: 73, score: 0.6577124183006536, best_
score: 0.7477124183006536
INFO:__main__:Epoch: 381 | Total Loss: 0.62 | Balanced Accuracy: 0.61
INFO:__main__:Best Balanced Accuracy Seen, validation/test: 0.75 0.71
!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!counter: 74, score: 0.6090849673202614, best_
score: 0.7477124183006536
INFO:__main__:Epoch: 382 | Total Loss: 0.58 | Balanced Accuracy: 0.65
INFO:__main__:Best Balanced Accuracy Seen, validation/test: 0.75 0.71
!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!counter: 75, score: 0.653921568627451, best_s
core: 0.7477124183006536
INFO:__main__:Epoch: 383 | Total Loss: 0.56 | Balanced Accuracy: 0.60
INFO:__main__:Best Balanced Accuracy Seen, validation/test: 0.75 0.71
!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!counter: 76, score: 0.6045098039215686, best_
score: 0.7477124183006536
INFO:__main__:Epoch: 384 | Total Loss: 0.56 | Balanced Accuracy: 0.59
INFO:__main__:Best Balanced Accuracy Seen, validation/test: 0.75 0.71
!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!counter: 77, score: 0.5905882352941177, best_
score: 0.7477124183006536
INFO:__main__:Epoch: 385 | Total Loss: 0.55 | Balanced Accuracy: 0.60
INFO:__main__:Best Balanced Accuracy Seen, validation/test: 0.75 0.71
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!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!counter: 78, score: 0.5954248366013072, best_
score: 0.7477124183006536
INFO:__main__:Epoch: 386 | Total Loss: 0.49 | Balanced Accuracy: 0.63
INFO:__main__:Best Balanced Accuracy Seen, validation/test: 0.75 0.71
!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!counter: 79, score: 0.6318954248366014, best_
score: 0.7477124183006536
INFO:__main__:Epoch: 387 | Total Loss: 0.53 | Balanced Accuracy: 0.67
INFO:__main__:Best Balanced Accuracy Seen, validation/test: 0.75 0.71
!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!counter: 80, score: 0.6670588235294117, best_
score: 0.7477124183006536
INFO:__main__:Epoch: 388 | Total Loss: 0.57 | Balanced Accuracy: 0.66
INFO:__main__:Best Balanced Accuracy Seen, validation/test: 0.75 0.71
!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!counter: 81, score: 0.6599346405228759, best_
score: 0.7477124183006536
INFO:__main__:Epoch: 389 | Total Loss: 0.62 | Balanced Accuracy: 0.69
INFO:__main__:Best Balanced Accuracy Seen, validation/test: 0.75 0.71
!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!counter: 82, score: 0.6861437908496733, best_
score: 0.7477124183006536
INFO:__main__:Epoch: 390 | Total Loss: 0.59 | Balanced Accuracy: 0.58
INFO:__main__:Best Balanced Accuracy Seen, validation/test: 0.75 0.71
!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!counter: 83, score: 0.5835294117647059, best_
score: 0.7477124183006536
INFO:__main__:Epoch: 391 | Total Loss: 0.48 | Balanced Accuracy: 0.68
INFO:__main__:Best Balanced Accuracy Seen, validation/test: 0.75 0.71
!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!counter: 84, score: 0.6833333333333332, best_
score: 0.7477124183006536
INFO:__main__:Epoch: 392 | Total Loss: 0.59 | Balanced Accuracy: 0.66
INFO:__main__:Best Balanced Accuracy Seen, validation/test: 0.75 0.71
!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!counter: 85, score: 0.6645751633986928, best_
score: 0.7477124183006536
INFO:__main__:Epoch: 393 | Total Loss: 0.50 | Balanced Accuracy: 0.62
INFO:__main__:Best Balanced Accuracy Seen, validation/test: 0.75 0.71
!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!counter: 86, score: 0.617516339869281, best_s
core: 0.7477124183006536
INFO:__main__:Epoch: 394 | Total Loss: 0.58 | Balanced Accuracy: 0.63
INFO:__main__:Best Balanced Accuracy Seen, validation/test: 0.75 0.71
!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!counter: 87, score: 0.6256209150326798, best_
score: 0.7477124183006536
INFO:__main__:Epoch: 395 | Total Loss: 0.51 | Balanced Accuracy: 0.66
INFO:__main__:Best Balanced Accuracy Seen, validation/test: 0.75 0.71
!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!counter: 88, score: 0.6573856209150327, best_
score: 0.7477124183006536
INFO:__main__:Epoch: 396 | Total Loss: 0.55 | Balanced Accuracy: 0.63
INFO:__main__:Best Balanced Accuracy Seen, validation/test: 0.75 0.71
!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!counter: 89, score: 0.6265359477124184, best_
score: 0.7477124183006536
INFO:__main__:Epoch: 397 | Total Loss: 0.50 | Balanced Accuracy: 0.67
INFO:__main__:Best Balanced Accuracy Seen, validation/test: 0.75 0.71
!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!counter: 90, score: 0.665751633986928, best_s
core: 0.7477124183006536
INFO:__main__:Epoch: 398 | Total Loss: 0.57 | Balanced Accuracy: 0.66
INFO:__main__:Best Balanced Accuracy Seen, validation/test: 0.75 0.71
!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!counter: 91, score: 0.6645751633986928, best_
score: 0.7477124183006536
INFO:__main__:Epoch: 399 | Total Loss: 0.62 | Balanced Accuracy: 0.64
INFO:__main__:Best Balanced Accuracy Seen, validation/test: 0.75 0.71
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!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!counter: 92, score: 0.6428104575163399, best_
score: 0.7477124183006536
INFO:__main__:Epoch: 400 | Total Loss: 0.55 | Balanced Accuracy: 0.67
INFO:__main__:Best Balanced Accuracy Seen, validation/test: 0.75 0.71
!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!counter: 93, score: 0.668954248366013, best_s
core: 0.7477124183006536
INFO:__main__:Epoch: 401 | Total Loss: 0.51 | Balanced Accuracy: 0.59
INFO:__main__:Best Balanced Accuracy Seen, validation/test: 0.75 0.71
!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!counter: 94, score: 0.5855555555555555, best_
score: 0.7477124183006536
INFO:__main__:Epoch: 402 | Total Loss: 0.58 | Balanced Accuracy: 0.70
INFO:__main__:Best Balanced Accuracy Seen, validation/test: 0.75 0.71
!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!counter: 95, score: 0.7047712418300653, best_
score: 0.7477124183006536
INFO:__main__:Epoch: 403 | Total Loss: 0.61 | Balanced Accuracy: 0.69
INFO:__main__:Best Balanced Accuracy Seen, validation/test: 0.75 0.71
!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!counter: 96, score: 0.6852287581699347, best_
score: 0.7477124183006536
INFO:__main__:Epoch: 404 | Total Loss: 0.48 | Balanced Accuracy: 0.69
INFO:__main__:Best Balanced Accuracy Seen, validation/test: 0.75 0.71
!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!counter: 97, score: 0.6918300653594772, best_
score: 0.7477124183006536
INFO:__main__:Epoch: 405 | Total Loss: 0.55 | Balanced Accuracy: 0.70
INFO:__main__:Best Balanced Accuracy Seen, validation/test: 0.75 0.71
!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!counter: 98, score: 0.7029411764705883, best_
score: 0.7477124183006536
INFO:__main__:Epoch: 406 | Total Loss: 0.56 | Balanced Accuracy: 0.71
INFO:__main__:Best Balanced Accuracy Seen, validation/test: 0.75 0.71
!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!counter: 99, score: 0.7077777777777777, best_
score: 0.7477124183006536
INFO:__main__:Epoch: 407 | Total Loss: 0.52 | Balanced Accuracy: 0.68
INFO:__main__:Best Balanced Accuracy Seen, validation/test: 0.75 0.71
!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!counter: 100, score: 0.6838562091503269, best
_score: 0.7477124183006536
INFO:__main__:Epoch: 408 | Total Loss: 0.63 | Balanced Accuracy: 0.62
INFO:__main__:Best Balanced Accuracy Seen, validation/test: 0.75 0.71
!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!counter: 101, score: 0.6200653594771242, best
_score: 0.7477124183006536
INFO:__main__:Epoch: 409 | Total Loss: 0.51 | Balanced Accuracy: 0.66
INFO:__main__:Best Balanced Accuracy Seen, validation/test: 0.75 0.71
!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!counter: 102, score: 0.6573202614379086, best
_score: 0.7477124183006536
INFO:__main__:Epoch: 410 | Total Loss: 0.55 | Balanced Accuracy: 0.68
INFO:__main__:Best Balanced Accuracy Seen, validation/test: 0.75 0.71
!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!counter: 103, score: 0.6807189542483659, best
_score: 0.7477124183006536
INFO:__main__:Epoch: 411 | Total Loss: 0.50 | Balanced Accuracy: 0.69
INFO:__main__:Best Balanced Accuracy Seen, validation/test: 0.75 0.71
!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!counter: 104, score: 0.6890849673202615, best
_score: 0.7477124183006536
INFO:__main__:Epoch: 412 | Total Loss: 0.60 | Balanced Accuracy: 0.72
INFO:__main__:Best Balanced Accuracy Seen, validation/test: 0.75 0.71
!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!counter: 105, score: 0.7164705882352941, best
_score: 0.7477124183006536
INFO:__main__:Epoch: 413 | Total Loss: 0.54 | Balanced Accuracy: 0.64
INFO:__main__:Best Balanced Accuracy Seen, validation/test: 0.75 0.71
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!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!counter: 106, score: 0.643921568627451, best\_score: 0.7477124183006536

INFO:\_\_main\_\_:Epoch: 414 | Total Loss: 0.55 | Balanced Accuracy: 0.63  
INFO:\_\_main\_\_:Best Balanced Accuracy Seen, validation/test: 0.75 0.71  
!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!counter: 107, score: 0.633202614379085, best\_score: 0.7477124183006536

INFO:\_\_main\_\_:Epoch: 415 | Total Loss: 0.45 | Balanced Accuracy: 0.67  
INFO:\_\_main\_\_:Best Balanced Accuracy Seen, validation/test: 0.75 0.71  
!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!counter: 108, score: 0.6729411764705882, best\_score: 0.7477124183006536

INFO:\_\_main\_\_:Epoch: 416 | Total Loss: 0.50 | Balanced Accuracy: 0.69  
INFO:\_\_main\_\_:Best Balanced Accuracy Seen, validation/test: 0.75 0.71  
!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!counter: 109, score: 0.6947712418300654, best\_score: 0.7477124183006536

INFO:\_\_main\_\_:Epoch: 417 | Total Loss: 0.67 | Balanced Accuracy: 0.58  
INFO:\_\_main\_\_:Best Balanced Accuracy Seen, validation/test: 0.75 0.71  
!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!counter: 110, score: 0.58, best\_score: 0.7477124183006536

INFO:\_\_main\_\_:Epoch: 418 | Total Loss: 0.71 | Balanced Accuracy: 0.60  
INFO:\_\_main\_\_:Best Balanced Accuracy Seen, validation/test: 0.75 0.71  
!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!counter: 111, score: 0.6044444444444445, best\_score: 0.7477124183006536

INFO:\_\_main\_\_:Epoch: 419 | Total Loss: 0.58 | Balanced Accuracy: 0.58  
INFO:\_\_main\_\_:Best Balanced Accuracy Seen, validation/test: 0.75 0.71  
!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!counter: 112, score: 0.5824183006535949, best\_score: 0.7477124183006536

INFO:\_\_main\_\_:Epoch: 420 | Total Loss: 0.54 | Balanced Accuracy: 0.66  
INFO:\_\_main\_\_:Best Balanced Accuracy Seen, validation/test: 0.75 0.71  
!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!counter: 113, score: 0.6645751633986928, best\_score: 0.7477124183006536

INFO:\_\_main\_\_:Epoch: 421 | Total Loss: 0.58 | Balanced Accuracy: 0.65  
INFO:\_\_main\_\_:Best Balanced Accuracy Seen, validation/test: 0.75 0.71  
!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!counter: 114, score: 0.653921568627451, best\_score: 0.7477124183006536

INFO:\_\_main\_\_:Epoch: 422 | Total Loss: 0.54 | Balanced Accuracy: 0.70  
INFO:\_\_main\_\_:Best Balanced Accuracy Seen, validation/test: 0.75 0.71  
!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!counter: 115, score: 0.7005882352941176, best\_score: 0.7477124183006536

INFO:\_\_main\_\_:Epoch: 423 | Total Loss: 0.50 | Balanced Accuracy: 0.63  
INFO:\_\_main\_\_:Best Balanced Accuracy Seen, validation/test: 0.75 0.71  
!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!counter: 116, score: 0.6270588235294118, best\_score: 0.7477124183006536

INFO:\_\_main\_\_:Epoch: 424 | Total Loss: 0.49 | Balanced Accuracy: 0.63  
INFO:\_\_main\_\_:Best Balanced Accuracy Seen, validation/test: 0.75 0.71  
!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!counter: 117, score: 0.6263398692810458, best\_score: 0.7477124183006536

INFO:\_\_main\_\_:Epoch: 425 | Total Loss: 0.54 | Balanced Accuracy: 0.66  
INFO:\_\_main\_\_:Best Balanced Accuracy Seen, validation/test: 0.75 0.71  
!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!counter: 118, score: 0.6585620915032679, best\_score: 0.7477124183006536

INFO:\_\_main\_\_:Epoch: 426 | Total Loss: 0.54 | Balanced Accuracy: 0.55  
INFO:\_\_main\_\_:Best Balanced Accuracy Seen, validation/test: 0.75 0.71  
!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!counter: 119, score: 0.5455555555555556, best\_score: 0.7477124183006536

INFO:\_\_main\_\_:Epoch: 427 | Total Loss: 0.58 | Balanced Accuracy: 0.66  
INFO:\_\_main\_\_:Best Balanced Accuracy Seen, validation/test: 0.75 0.71

!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!counter: 120, score: 0.6552287581699346, best \_score: 0.7477124183006536

INFO:\_\_main\_\_:Epoch: 428 | Total Loss: 0.59 | Balanced Accuracy: 0.64

INFO:\_\_main\_\_:Best Balanced Accuracy Seen, validation/test: 0.75 0.71

!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!counter: 121, score: 0.6407843137254902, best \_score: 0.7477124183006536

INFO:\_\_main\_\_:Epoch: 429 | Total Loss: 0.68 | Balanced Accuracy: 0.55

INFO:\_\_main\_\_:Best Balanced Accuracy Seen, validation/test: 0.75 0.71

!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!counter: 122, score: 0.5518954248366014, best \_score: 0.7477124183006536

INFO:\_\_main\_\_:Epoch: 430 | Total Loss: 0.64 | Balanced Accuracy: 0.66

INFO:\_\_main\_\_:Best Balanced Accuracy Seen, validation/test: 0.75 0.71

!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!counter: 123, score: 0.6594771241830065, best \_score: 0.7477124183006536

INFO:\_\_main\_\_:Epoch: 431 | Total Loss: 0.56 | Balanced Accuracy: 0.68

INFO:\_\_main\_\_:Best Balanced Accuracy Seen, validation/test: 0.75 0.71

!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!counter: 124, score: 0.683333333333332, best \_score: 0.7477124183006536

INFO:\_\_main\_\_:Epoch: 432 | Total Loss: 0.57 | Balanced Accuracy: 0.68

INFO:\_\_main\_\_:Best Balanced Accuracy Seen, validation/test: 0.75 0.71

!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!counter: 125, score: 0.6816339869281046, best \_score: 0.7477124183006536

INFO:\_\_main\_\_:Epoch: 433 | Total Loss: 0.62 | Balanced Accuracy: 0.67

INFO:\_\_main\_\_:Best Balanced Accuracy Seen, validation/test: 0.75 0.71

!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!counter: 126, score: 0.6661437908496732, best \_score: 0.7477124183006536

INFO:\_\_main\_\_:Epoch: 434 | Total Loss: 0.60 | Balanced Accuracy: 0.68

INFO:\_\_main\_\_:Best Balanced Accuracy Seen, validation/test: 0.75 0.71

!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!counter: 127, score: 0.67640522875817, best\_s core: 0.7477124183006536

INFO:\_\_main\_\_:Epoch: 435 | Total Loss: 0.53 | Balanced Accuracy: 0.70

INFO:\_\_main\_\_:Best Balanced Accuracy Seen, validation/test: 0.75 0.71

!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!counter: 128, score: 0.7022222222222222, best \_score: 0.7477124183006536

INFO:\_\_main\_\_:Epoch: 436 | Total Loss: 0.59 | Balanced Accuracy: 0.66

INFO:\_\_main\_\_:Best Balanced Accuracy Seen, validation/test: 0.75 0.71

!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!counter: 129, score: 0.6618954248366012, best \_score: 0.7477124183006536

INFO:\_\_main\_\_:Epoch: 437 | Total Loss: 0.53 | Balanced Accuracy: 0.67

INFO:\_\_main\_\_:Best Balanced Accuracy Seen, validation/test: 0.75 0.71

!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!counter: 130, score: 0.6683660130718955, best \_score: 0.7477124183006536

INFO:\_\_main\_\_:Epoch: 438 | Total Loss: 0.55 | Balanced Accuracy: 0.61

INFO:\_\_main\_\_:Best Balanced Accuracy Seen, validation/test: 0.75 0.71

!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!counter: 131, score: 0.6099346405228758, best \_score: 0.7477124183006536

INFO:\_\_main\_\_:Epoch: 439 | Total Loss: 0.51 | Balanced Accuracy: 0.62

INFO:\_\_main\_\_:Best Balanced Accuracy Seen, validation/test: 0.75 0.71

!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!counter: 132, score: 0.6171895424836601, best \_score: 0.7477124183006536

INFO:\_\_main\_\_:Epoch: 440 | Total Loss: 0.67 | Balanced Accuracy: 0.61

INFO:\_\_main\_\_:Best Balanced Accuracy Seen, validation/test: 0.75 0.71

!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!counter: 133, score: 0.6075816993464053, best \_score: 0.7477124183006536

INFO:\_\_main\_\_:Epoch: 441 | Total Loss: 0.57 | Balanced Accuracy: 0.67

INFO:\_\_main\_\_:Best Balanced Accuracy Seen, validation/test: 0.75 0.71

!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!counter: 134, score: 0.6658823529411765, best\_score: 0.7477124183006536

INFO:\_\_main\_\_:Epoch: 442 | Total Loss: 0.51 | Balanced Accuracy: 0.60

INFO:\_\_main\_\_:Best Balanced Accuracy Seen, validation/test: 0.75 0.71

!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!counter: 135, score: 0.6011111111111111, best\_score: 0.7477124183006536

INFO:\_\_main\_\_:Epoch: 443 | Total Loss: 0.61 | Balanced Accuracy: 0.60

INFO:\_\_main\_\_:Best Balanced Accuracy Seen, validation/test: 0.75 0.71

!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!counter: 136, score: 0.60359477124183, best\_score: 0.7477124183006536

INFO:\_\_main\_\_:Epoch: 444 | Total Loss: 0.58 | Balanced Accuracy: 0.57

INFO:\_\_main\_\_:Best Balanced Accuracy Seen, validation/test: 0.75 0.71

!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!counter: 137, score: 0.5666666666666668, best\_score: 0.7477124183006536

INFO:\_\_main\_\_:Epoch: 445 | Total Loss: 0.61 | Balanced Accuracy: 0.65

INFO:\_\_main\_\_:Best Balanced Accuracy Seen, validation/test: 0.75 0.71

!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!counter: 138, score: 0.6499346405228758, best\_score: 0.7477124183006536

INFO:\_\_main\_\_:Epoch: 446 | Total Loss: 0.60 | Balanced Accuracy: 0.69

INFO:\_\_main\_\_:Best Balanced Accuracy Seen, validation/test: 0.75 0.71

!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!counter: 139, score: 0.685359477124183, best\_score: 0.7477124183006536

INFO:\_\_main\_\_:Epoch: 447 | Total Loss: 0.55 | Balanced Accuracy: 0.60

INFO:\_\_main\_\_:Best Balanced Accuracy Seen, validation/test: 0.75 0.71

!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!counter: 140, score: 0.5990849673202615, best\_score: 0.7477124183006536

INFO:\_\_main\_\_:Epoch: 448 | Total Loss: 0.55 | Balanced Accuracy: 0.60

INFO:\_\_main\_\_:Best Balanced Accuracy Seen, validation/test: 0.75 0.71

!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!counter: 141, score: 0.5979084967320261, best\_score: 0.7477124183006536

INFO:\_\_main\_\_:Epoch: 449 | Total Loss: 0.52 | Balanced Accuracy: 0.65

INFO:\_\_main\_\_:Best Balanced Accuracy Seen, validation/test: 0.75 0.71

!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!counter: 142, score: 0.6503921568627451, best\_score: 0.7477124183006536

INFO:\_\_main\_\_:Epoch: 450 | Total Loss: 0.61 | Balanced Accuracy: 0.67

INFO:\_\_main\_\_:Best Balanced Accuracy Seen, validation/test: 0.75 0.71

!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!counter: 143, score: 0.6718954248366013, best\_score: 0.7477124183006536

INFO:\_\_main\_\_:Epoch: 451 | Total Loss: 0.55 | Balanced Accuracy: 0.60

INFO:\_\_main\_\_:Best Balanced Accuracy Seen, validation/test: 0.75 0.71

!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!counter: 144, score: 0.5952287581699346, best\_score: 0.7477124183006536

INFO:\_\_main\_\_:Epoch: 452 | Total Loss: 0.50 | Balanced Accuracy: 0.62

INFO:\_\_main\_\_:Best Balanced Accuracy Seen, validation/test: 0.75 0.71

!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!counter: 145, score: 0.6150326797385621, best\_score: 0.7477124183006536

INFO:\_\_main\_\_:Epoch: 453 | Total Loss: 0.54 | Balanced Accuracy: 0.70

INFO:\_\_main\_\_:Best Balanced Accuracy Seen, validation/test: 0.75 0.71

!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!counter: 146, score: 0.698562091503268, best\_score: 0.7477124183006536

INFO:\_\_main\_\_:Epoch: 454 | Total Loss: 0.62 | Balanced Accuracy: 0.60

INFO:\_\_main\_\_:Best Balanced Accuracy Seen, validation/test: 0.75 0.71

!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!counter: 147, score: 0.5983660130718954, best\_score: 0.7477124183006536

INFO:\_\_main\_\_:Epoch: 455 | Total Loss: 0.55 | Balanced Accuracy: 0.59

INFO:\_\_main\_\_:Best Balanced Accuracy Seen, validation/test: 0.75 0.71

!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!counter: 148, score: 0.5945098039215687, best \_score: 0.7477124183006536

INFO:\_\_main\_\_:Epoch: 456 | Total Loss: 0.59 | Balanced Accuracy: 0.59

INFO:\_\_main\_\_:Best Balanced Accuracy Seen, validation/test: 0.75 0.71

!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!counter: 149, score: 0.589673202614379, best \_score: 0.7477124183006536

INFO:\_\_main\_\_:Epoch: 457 | Total Loss: 0.54 | Balanced Accuracy: 0.63

INFO:\_\_main\_\_:Best Balanced Accuracy Seen, validation/test: 0.75 0.71

!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!counter: 150, score: 0.6311764705882353, best \_score: 0.7477124183006536

INFO:\_\_main\_\_:Epoch: 458 | Total Loss: 0.54 | Balanced Accuracy: 0.63

INFO:\_\_main\_\_:Best Balanced Accuracy Seen, validation/test: 0.75 0.71

!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!counter: 151, score: 0.6301960784313725, best \_score: 0.7477124183006536

INFO:\_\_main\_\_:Epoch: 459 | Total Loss: 0.52 | Balanced Accuracy: 0.62

INFO:\_\_main\_\_:Best Balanced Accuracy Seen, validation/test: 0.75 0.71

!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!counter: 152, score: 0.6168627450980392, best \_score: 0.7477124183006536

INFO:\_\_main\_\_:Epoch: 460 | Total Loss: 0.54 | Balanced Accuracy: 0.54

INFO:\_\_main\_\_:Best Balanced Accuracy Seen, validation/test: 0.75 0.71

!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!counter: 153, score: 0.5419607843137255, best \_score: 0.7477124183006536

INFO:\_\_main\_\_:Epoch: 461 | Total Loss: 0.58 | Balanced Accuracy: 0.70

INFO:\_\_main\_\_:Best Balanced Accuracy Seen, validation/test: 0.75 0.71

!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!counter: 154, score: 0.6963398692810457, best \_score: 0.7477124183006536

INFO:\_\_main\_\_:Epoch: 462 | Total Loss: 0.55 | Balanced Accuracy: 0.70

INFO:\_\_main\_\_:Best Balanced Accuracy Seen, validation/test: 0.75 0.71

!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!counter: 155, score: 0.6966666666666667, best \_score: 0.7477124183006536

INFO:\_\_main\_\_:Epoch: 463 | Total Loss: 0.47 | Balanced Accuracy: 0.66

INFO:\_\_main\_\_:Best Balanced Accuracy Seen, validation/test: 0.75 0.71

!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!counter: 156, score: 0.6641176470588235, best \_score: 0.7477124183006536

INFO:\_\_main\_\_:Epoch: 464 | Total Loss: 0.61 | Balanced Accuracy: 0.64

INFO:\_\_main\_\_:Best Balanced Accuracy Seen, validation/test: 0.75 0.71

!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!counter: 157, score: 0.6352941176470588, best \_score: 0.7477124183006536

INFO:\_\_main\_\_:Epoch: 465 | Total Loss: 0.51 | Balanced Accuracy: 0.51

INFO:\_\_main\_\_:Best Balanced Accuracy Seen, validation/test: 0.75 0.71

!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!counter: 158, score: 0.5107843137254902, best \_score: 0.7477124183006536

INFO:\_\_main\_\_:Epoch: 466 | Total Loss: 0.54 | Balanced Accuracy: 0.66

INFO:\_\_main\_\_:Best Balanced Accuracy Seen, validation/test: 0.75 0.71

!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!counter: 159, score: 0.6585620915032679, best \_score: 0.7477124183006536

INFO:\_\_main\_\_:Epoch: 467 | Total Loss: 0.71 | Balanced Accuracy: 0.70

INFO:\_\_main\_\_:Best Balanced Accuracy Seen, validation/test: 0.75 0.71

!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!counter: 160, score: 0.6954901960784313, best \_score: 0.7477124183006536

INFO:\_\_main\_\_:Epoch: 468 | Total Loss: 0.61 | Balanced Accuracy: 0.67

INFO:\_\_main\_\_:Best Balanced Accuracy Seen, validation/test: 0.75 0.71

!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!counter: 161, score: 0.6748366013071895, best \_score: 0.7477124183006536

INFO:\_\_main\_\_:Epoch: 469 | Total Loss: 0.51 | Balanced Accuracy: 0.68

INFO:\_\_main\_\_:Best Balanced Accuracy Seen, validation/test: 0.75 0.71

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!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!counter: 162, score: 0.6750326797385621, best
_score: 0.7477124183006536
INFO:__main__:Epoch: 470 | Total Loss: 0.54 | Balanced Accuracy: 0.71
INFO:__main__:Best Balanced Accuracy Seen, validation/test: 0.75 0.71
!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!counter: 163, score: 0.7122222222222222, best
_score: 0.7477124183006536
INFO:__main__:Epoch: 471 | Total Loss: 0.65 | Balanced Accuracy: 0.72
INFO:__main__:Best Balanced Accuracy Seen, validation/test: 0.75 0.71
!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!counter: 164, score: 0.7211111111111111, best_
score: 0.7477124183006536
INFO:__main__:Epoch: 472 | Total Loss: 0.55 | Balanced Accuracy: 0.66
INFO:__main__:Best Balanced Accuracy Seen, validation/test: 0.75 0.71
!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!counter: 165, score: 0.6633986928104575, best
_score: 0.7477124183006536
INFO:__main__:Epoch: 473 | Total Loss: 0.54 | Balanced Accuracy: 0.62
INFO:__main__:Best Balanced Accuracy Seen, validation/test: 0.75 0.71
!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!counter: 166, score: 0.6205228758169935, best
_score: 0.7477124183006536
INFO:__main__:Epoch: 474 | Total Loss: 0.76 | Balanced Accuracy: 0.63
INFO:__main__:Best Balanced Accuracy Seen, validation/test: 0.75 0.71
!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!counter: 167, score: 0.6294771241830066, best
_score: 0.7477124183006536
INFO:__main__:Epoch: 475 | Total Loss: 0.56 | Balanced Accuracy: 0.68
INFO:__main__:Best Balanced Accuracy Seen, validation/test: 0.75 0.71
!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!counter: 168, score: 0.676470588235294, best_
score: 0.7477124183006536
INFO:__main__:Epoch: 476 | Total Loss: 0.53 | Balanced Accuracy: 0.64
INFO:__main__:Best Balanced Accuracy Seen, validation/test: 0.75 0.71
!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!counter: 169, score: 0.643921568627451, best_
score: 0.7477124183006536
INFO:__main__:Epoch: 477 | Total Loss: 0.55 | Balanced Accuracy: 0.74
INFO:__main__:Best Balanced Accuracy Seen, validation/test: 0.75 0.71
!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!counter: 170, score: 0.737516339869281, best_
score: 0.7477124183006536
INFO:__main__:Epoch: 478 | Total Loss: 0.57 | Balanced Accuracy: 0.65
INFO:__main__:Best Balanced Accuracy Seen, validation/test: 0.75 0.71
!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!counter: 171, score: 0.6470588235294118, best
_score: 0.7477124183006536
INFO:__main__:Epoch: 479 | Total Loss: 0.54 | Balanced Accuracy: 0.63
INFO:__main__:Best Balanced Accuracy Seen, validation/test: 0.75 0.71
!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!counter: 172, score: 0.6348366013071894, best_
score: 0.7477124183006536
INFO:__main__:Epoch: 480 | Total Loss: 0.51 | Balanced Accuracy: 0.64
INFO:__main__:Best Balanced Accuracy Seen, validation/test: 0.75 0.71
!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!counter: 173, score: 0.6441176470588236, best
_score: 0.7477124183006536
INFO:__main__:Epoch: 481 | Total Loss: 0.59 | Balanced Accuracy: 0.64
INFO:__main__:Best Balanced Accuracy Seen, validation/test: 0.75 0.71
!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!counter: 174, score: 0.640718954248366, best_
score: 0.7477124183006536
INFO:__main__:Epoch: 482 | Total Loss: 0.60 | Balanced Accuracy: 0.69
INFO:__main__:Best Balanced Accuracy Seen, validation/test: 0.75 0.71
!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!counter: 175, score: 0.6931372549019609, best
_score: 0.7477124183006536
INFO:__main__:Epoch: 483 | Total Loss: 0.52 | Balanced Accuracy: 0.58
INFO:__main__:Best Balanced Accuracy Seen, validation/test: 0.75 0.71
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!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!counter: 176, score: 0.5781699346405228, best \_score: 0.7477124183006536

INFO:\_\_main\_\_:Epoch: 484 | Total Loss: 0.52 | Balanced Accuracy: 0.61  
INFO:\_\_main\_\_:Best Balanced Accuracy Seen, validation/test: 0.75 0.71  
!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!counter: 177, score: 0.6052287581699346, best \_score: 0.7477124183006536

INFO:\_\_main\_\_:Epoch: 485 | Total Loss: 0.52 | Balanced Accuracy: 0.68  
INFO:\_\_main\_\_:Best Balanced Accuracy Seen, validation/test: 0.75 0.71  
!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!counter: 178, score: 0.6826143790849674, best \_score: 0.7477124183006536

INFO:\_\_main\_\_:Epoch: 486 | Total Loss: 0.66 | Balanced Accuracy: 0.63  
INFO:\_\_main\_\_:Best Balanced Accuracy Seen, validation/test: 0.75 0.71  
!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!counter: 179, score: 0.6313071895424837, best \_score: 0.7477124183006536

INFO:\_\_main\_\_:Epoch: 487 | Total Loss: 0.55 | Balanced Accuracy: 0.63  
INFO:\_\_main\_\_:Best Balanced Accuracy Seen, validation/test: 0.75 0.71  
!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!counter: 180, score: 0.6301960784313725, best \_score: 0.7477124183006536

INFO:\_\_main\_\_:Epoch: 488 | Total Loss: 0.52 | Balanced Accuracy: 0.65  
INFO:\_\_main\_\_:Best Balanced Accuracy Seen, validation/test: 0.75 0.71  
!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!counter: 181, score: 0.6503267973856209, best \_score: 0.7477124183006536

INFO:\_\_main\_\_:Epoch: 489 | Total Loss: 0.54 | Balanced Accuracy: 0.61  
INFO:\_\_main\_\_:Best Balanced Accuracy Seen, validation/test: 0.75 0.71  
!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!counter: 182, score: 0.6081699346405228, best \_score: 0.7477124183006536

INFO:\_\_main\_\_:Epoch: 490 | Total Loss: 0.62 | Balanced Accuracy: 0.69  
INFO:\_\_main\_\_:Best Balanced Accuracy Seen, validation/test: 0.75 0.71  
!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!counter: 183, score: 0.6880392156862746, best \_score: 0.7477124183006536

INFO:\_\_main\_\_:Epoch: 491 | Total Loss: 0.63 | Balanced Accuracy: 0.61  
INFO:\_\_main\_\_:Best Balanced Accuracy Seen, validation/test: 0.75 0.71  
!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!counter: 184, score: 0.6064052287581699, best \_score: 0.7477124183006536

INFO:\_\_main\_\_:Epoch: 492 | Total Loss: 0.57 | Balanced Accuracy: 0.66  
INFO:\_\_main\_\_:Best Balanced Accuracy Seen, validation/test: 0.75 0.71  
!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!counter: 185, score: 0.6644444444444444, best \_score: 0.7477124183006536

INFO:\_\_main\_\_:Epoch: 493 | Total Loss: 0.55 | Balanced Accuracy: 0.61  
INFO:\_\_main\_\_:Best Balanced Accuracy Seen, validation/test: 0.75 0.71  
!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!counter: 186, score: 0.6096078431372549, best \_score: 0.7477124183006536

INFO:\_\_main\_\_:Epoch: 494 | Total Loss: 0.56 | Balanced Accuracy: 0.61  
INFO:\_\_main\_\_:Best Balanced Accuracy Seen, validation/test: 0.75 0.71  
!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!counter: 187, score: 0.6101960784313726, best \_score: 0.7477124183006536

INFO:\_\_main\_\_:Epoch: 495 | Total Loss: 0.58 | Balanced Accuracy: 0.66  
INFO:\_\_main\_\_:Best Balanced Accuracy Seen, validation/test: 0.75 0.71  
!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!counter: 188, score: 0.6615686274509804, best \_score: 0.7477124183006536

INFO:\_\_main\_\_:Epoch: 496 | Total Loss: 0.54 | Balanced Accuracy: 0.65  
INFO:\_\_main\_\_:Best Balanced Accuracy Seen, validation/test: 0.75 0.71  
!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!counter: 189, score: 0.6501960784313726, best \_score: 0.7477124183006536

INFO:\_\_main\_\_:Epoch: 497 | Total Loss: 0.49 | Balanced Accuracy: 0.62  
INFO:\_\_main\_\_:Best Balanced Accuracy Seen, validation/test: 0.75 0.71

```
!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!counter: 190, score: 0.6228104575163399, best
_score: 0.7477124183006536
INFO:__main__:Epoch: 498 | Total Loss: 0.49 | Balanced Accuracy: 0.68
INFO:__main__:Best Balanced Accuracy Seen, validation/test: 0.75 0.71
!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!counter: 191, score: 0.6826143790849674, best
_score: 0.7477124183006536
INFO:__main__:Epoch: 499 | Total Loss: 0.50 | Balanced Accuracy: 0.61
INFO:__main__:Best Balanced Accuracy Seen, validation/test: 0.75 0.71
!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!counter: 192, score: 0.6054248366013072, best
_score: 0.7477124183006536
INFO:__main__:Epoch: 500 | Total Loss: 0.50 | Balanced Accuracy: 0.57
INFO:__main__:Best Balanced Accuracy Seen, validation/test: 0.75 0.71
!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!counter: 193, score: 0.5737254901960784, best
_score: 0.7477124183006536
INFO:__main__:Epoch: 501 | Total Loss: 0.70 | Balanced Accuracy: 0.56
INFO:__main__:Best Balanced Accuracy Seen, validation/test: 0.75 0.71
!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!counter: 194, score: 0.5605882352941176, best
_score: 0.7477124183006536
INFO:__main__:Epoch: 502 | Total Loss: 0.61 | Balanced Accuracy: 0.62
INFO:__main__:Best Balanced Accuracy Seen, validation/test: 0.75 0.71
!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!counter: 195, score: 0.6228104575163399, best
_score: 0.7477124183006536
INFO:__main__:Epoch: 503 | Total Loss: 0.58 | Balanced Accuracy: 0.63
INFO:__main__:Best Balanced Accuracy Seen, validation/test: 0.75 0.71
!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!counter: 196, score: 0.625032679738562, best_
score: 0.7477124183006536
INFO:__main__:Epoch: 504 | Total Loss: 0.57 | Balanced Accuracy: 0.66
INFO:__main__:Best Balanced Accuracy Seen, validation/test: 0.75 0.71
!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!counter: 197, score: 0.6618954248366012, best
_score: 0.7477124183006536
INFO:__main__:Epoch: 505 | Total Loss: 0.53 | Balanced Accuracy: 0.62
INFO:__main__:Best Balanced Accuracy Seen, validation/test: 0.75 0.71
!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!counter: 198, score: 0.6229411764705882, best
_score: 0.7477124183006536
INFO:__main__:Epoch: 506 | Total Loss: 0.59 | Balanced Accuracy: 0.66
INFO:__main__:Best Balanced Accuracy Seen, validation/test: 0.75 0.71
!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!counter: 199, score: 0.6600653594771242, best
_score: 0.7477124183006536
INFO:__main__:Epoch: 507 | Total Loss: 0.62 | Balanced Accuracy: 0.63
INFO:__main__:Best Balanced Accuracy Seen, validation/test: 0.75 0.71
!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!counter: 200, score: 0.6252287581699346, best
_score: 0.7477124183006536
```

## Image-Level Pre Training

This block configures training the SAMIL model with Image Level pretraining. Per the paper, the max epochs is set to 2,000 with a warmup of 200 epochs and patient of 200 epochs.

The `MIL_checkpoint_path` and `view_checkpoint_path` point to the appropriate model for this ablation.

```
In [ ]: RUNS_DIR = '/content/runs/'

from torch.utils.data import DataLoader

train_loader = DataLoader(
    train_dataset_randaug, batch_size=1, shuffle=True, num_workers=8
)
val_loader = DataLoader(val_dataset, batch_size=1, shuffle=False, num_workers=8)
test_loader = DataLoader(test_dataset, batch_size=1, shuffle=False, num_workers=8)

training_seed= 0
data_seed= 0
checkpoint_dir= MODEL_CHECKPOINTS
MIL_checkpoint_path= ''
lr= 0.0005 # learning rate
wd= 0.0001 # weight decay
T= 0.1 # temperture
lambda_ViewRegularization= 15.0 # λsA
train_dir= RUNS_DIR + 'SAMIL'
resume= 'None'
train_epoch= 2000 # number of epochs, 2000 defined in the paper. CHANGE ME!
device= device
start_epoch= 0
patience= 200
early_stopping_warmup= 200
ViewRegularization_warmup_pos= 0.4
eval_every_Xepoch= 1
experiment_type='ImageLevel'

set_seed(training_seed)
MIL_checkpoint_path = os.path.join(checkpoint_dir, 'MOCO_Pretraining_ImageLevel', 's')
view_checkpoint_path = os.path.join(checkpoint_dir, 'view_classifier', 'seed0_model')

experiment_name = "{}".format(experiment_type)
experiment_dir = os.path.join(train_dir, experiment_name)
os.makedirs(experiment_dir, exist_ok=True)

weights = '0.463,0.342,0.195'
weights = [float(i) for i in weights.split(',')]
weights = torch.Tensor(weights)
weights = weights.to(device)

view_model = create_view_model(view_checkpoint_path).to(device)

model = create_model(MIL_checkpoint_path).to(device)

no_decay = {'bias', 'bn'}
grouped_parameters = [
    {'params': [p for n, p in model.named_parameters() if not any(
        nd in n for nd in no_decay)], 'weight_decay': wd},
    {'params': [p for n, p in model.named_parameters() if any(
        nd in n for nd in no_decay)], 'weight_decay': 0.0}
]

optimizer = optim.SGD(grouped_parameters, lr=lr, momentum=0.9, nesterov=True)
scheduler = get_cosine_schedule_with_warmup(optimizer, 0, train_epoch)

train_samil(
    train_epoch,
```

```
    patience,
    early_stopping_warmup,
    eval_every_Xepoch,
    experiment_type,
    experiment_dir,
    weights,
    train_loader,
    val_loader,
    model,
    view_model,
    optimizer,
    scheduler,
    lambda_ViewRegularization,
    ViewRegularization_warmup_pos,
    T
)
```

```
INFO:__main__:Total params for View Model: 5.93M
INFO:__main__:Total params: 2.31M
INFO:__main__:***** Running training *****
INFO:__main__: Num Epochs = 2000
INFO:__main__: Total optimization steps = 720000
Using checkpoint path: /content/model_checkpoints/MOCO_Pretraining_ImageLevel/seed0
_checkpoint.pt
```













```
INFO:__main__:Best Balanced Accuracy Seen, validation/test: 0.72 0.68
INFO:__main__:Epoch: 180 | Total Loss: 0.41 | Balanced Accuracy: 0.59
INFO:__main__:Best Balanced Accuracy Seen, validation/test: 0.72 0.68
INFO:__main__:Epoch: 181 | Total Loss: 0.56 | Balanced Accuracy: 0.64
INFO:__main__:Best Balanced Accuracy Seen, validation/test: 0.72 0.68
INFO:__main__:Epoch: 182 | Total Loss: 0.45 | Balanced Accuracy: 0.62
INFO:__main__:Best Balanced Accuracy Seen, validation/test: 0.72 0.68
INFO:__main__:Epoch: 183 | Total Loss: 0.47 | Balanced Accuracy: 0.62
INFO:__main__:Best Balanced Accuracy Seen, validation/test: 0.72 0.68
INFO:__main__:Epoch: 184 | Total Loss: 0.48 | Balanced Accuracy: 0.61
INFO:__main__:Best Balanced Accuracy Seen, validation/test: 0.72 0.68
INFO:__main__:Epoch: 185 | Total Loss: 0.44 | Balanced Accuracy: 0.66
INFO:__main__:Best Balanced Accuracy Seen, validation/test: 0.72 0.68
INFO:__main__:Epoch: 186 | Total Loss: 0.45 | Balanced Accuracy: 0.66
INFO:__main__:Best Balanced Accuracy Seen, validation/test: 0.72 0.68
INFO:__main__:Epoch: 187 | Total Loss: 0.46 | Balanced Accuracy: 0.67
INFO:__main__:Best Balanced Accuracy Seen, validation/test: 0.72 0.68
INFO:__main__:Epoch: 188 | Total Loss: 0.44 | Balanced Accuracy: 0.53
INFO:__main__:Best Balanced Accuracy Seen, validation/test: 0.72 0.68
INFO:__main__:Epoch: 189 | Total Loss: 0.54 | Balanced Accuracy: 0.61
INFO:__main__:Best Balanced Accuracy Seen, validation/test: 0.72 0.68
INFO:__main__:Epoch: 190 | Total Loss: 0.54 | Balanced Accuracy: 0.59
INFO:__main__:Best Balanced Accuracy Seen, validation/test: 0.72 0.68
INFO:__main__:Epoch: 191 | Total Loss: 0.37 | Balanced Accuracy: 0.57
INFO:__main__:Best Balanced Accuracy Seen, validation/test: 0.72 0.68
INFO:__main__:Epoch: 192 | Total Loss: 0.48 | Balanced Accuracy: 0.56
INFO:__main__:Best Balanced Accuracy Seen, validation/test: 0.72 0.68
INFO:__main__:Epoch: 193 | Total Loss: 0.43 | Balanced Accuracy: 0.60
INFO:__main__:Best Balanced Accuracy Seen, validation/test: 0.72 0.68
INFO:__main__:Epoch: 194 | Total Loss: 0.53 | Balanced Accuracy: 0.62
INFO:__main__:Best Balanced Accuracy Seen, validation/test: 0.72 0.68
INFO:__main__:Epoch: 195 | Total Loss: 0.49 | Balanced Accuracy: 0.65
INFO:__main__:Best Balanced Accuracy Seen, validation/test: 0.72 0.68
INFO:__main__:Epoch: 196 | Total Loss: 0.51 | Balanced Accuracy: 0.57
INFO:__main__:Best Balanced Accuracy Seen, validation/test: 0.72 0.68
INFO:__main__:Epoch: 197 | Total Loss: 0.44 | Balanced Accuracy: 0.64
INFO:__main__:Best Balanced Accuracy Seen, validation/test: 0.72 0.68
INFO:__main__:Epoch: 198 | Total Loss: 0.41 | Balanced Accuracy: 0.66
INFO:__main__:Best Balanced Accuracy Seen, validation/test: 0.72 0.68
INFO:__main__:Epoch: 199 | Total Loss: 0.58 | Balanced Accuracy: 0.65
INFO:__main__:Best Balanced Accuracy Seen, validation/test: 0.72 0.68
INFO:__main__:Epoch: 200 | Total Loss: 0.46 | Balanced Accuracy: 0.64
INFO:__main__:Best Balanced Accuracy Seen, validation/test: 0.72 0.68
INFO:__main__:Epoch: 201 | Total Loss: 0.45 | Balanced Accuracy: 0.54
INFO:__main__:Best Balanced Accuracy Seen, validation/test: 0.72 0.68
!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!counter: 0, score: 0.5405882352941176, best_s
core: 0.5405882352941176
INFO:__main__:Epoch: 202 | Total Loss: 0.49 | Balanced Accuracy: 0.68
INFO:__main__:Best Balanced Accuracy Seen, validation/test: 0.72 0.68
!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!counter: 0, score: 0.6805228758169934, best_s
core: 0.6805228758169934
INFO:__main__:Epoch: 203 | Total Loss: 0.49 | Balanced Accuracy: 0.66
INFO:__main__:Best Balanced Accuracy Seen, validation/test: 0.72 0.68
!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!counter: 1, score: 0.6579738562091503, best_s
core: 0.6805228758169934
INFO:__main__:Epoch: 204 | Total Loss: 0.47 | Balanced Accuracy: 0.64
INFO:__main__:Best Balanced Accuracy Seen, validation/test: 0.72 0.68
!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!counter: 2, score: 0.6431372549019608, best_s
core: 0.6805228758169934
```

```
INFO:__main__:Epoch: 205 | Total Loss: 0.51 | Balanced Accuracy: 0.67
INFO:__main__:Best Balanced Accuracy Seen, validation/test: 0.72 0.68
!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!counter: 3, score: 0.6705882352941176, best_s
core: 0.6805228758169934
INFO:__main__:Epoch: 206 | Total Loss: 0.53 | Balanced Accuracy: 0.65
INFO:__main__:Best Balanced Accuracy Seen, validation/test: 0.72 0.68
!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!counter: 4, score: 0.6547712418300654, best_s
core: 0.6805228758169934
INFO:__main__:Epoch: 207 | Total Loss: 0.51 | Balanced Accuracy: 0.67
INFO:__main__:Best Balanced Accuracy Seen, validation/test: 0.72 0.68
!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!counter: 5, score: 0.6743790849673202, best_s
core: 0.6805228758169934
INFO:__main__:Epoch: 208 | Total Loss: 0.45 | Balanced Accuracy: 0.65
INFO:__main__:Best Balanced Accuracy Seen, validation/test: 0.72 0.68
!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!counter: 6, score: 0.6461437908496732, best_s
core: 0.6805228758169934
INFO:__main__:Epoch: 209 | Total Loss: 0.38 | Balanced Accuracy: 0.64
INFO:__main__:Best Balanced Accuracy Seen, validation/test: 0.72 0.68
!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!counter: 7, score: 0.6363398692810458, best_s
core: 0.6805228758169934
INFO:__main__:Epoch: 210 | Total Loss: 0.48 | Balanced Accuracy: 0.65
INFO:__main__:Best Balanced Accuracy Seen, validation/test: 0.72 0.68
!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!counter: 8, score: 0.6468627450980392, best_s
core: 0.6805228758169934
INFO:__main__:Epoch: 211 | Total Loss: 0.43 | Balanced Accuracy: 0.62
INFO:__main__:Best Balanced Accuracy Seen, validation/test: 0.72 0.68
!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!counter: 9, score: 0.6197385620915032, best_s
core: 0.6805228758169934
INFO:__main__:Epoch: 212 | Total Loss: 0.38 | Balanced Accuracy: 0.69
INFO:__main__:Best Balanced Accuracy Seen, validation/test: 0.72 0.68
!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!counter: 0, score: 0.6880392156862746, best_s
core: 0.6880392156862746
INFO:__main__:Epoch: 213 | Total Loss: 0.45 | Balanced Accuracy: 0.63
INFO:__main__:Best Balanced Accuracy Seen, validation/test: 0.72 0.68
!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!counter: 1, score: 0.6267320261437909, best_s
core: 0.6880392156862746
INFO:__main__:Epoch: 214 | Total Loss: 0.46 | Balanced Accuracy: 0.64
INFO:__main__:Best Balanced Accuracy Seen, validation/test: 0.72 0.68
!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!counter: 2, score: 0.6355555555555555, best_s
core: 0.6880392156862746
INFO:__main__:Epoch: 215 | Total Loss: 0.40 | Balanced Accuracy: 0.64
INFO:__main__:Best Balanced Accuracy Seen, validation/test: 0.72 0.68
!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!counter: 3, score: 0.6352287581699346, best_s
core: 0.6880392156862746
INFO:__main__:Epoch: 216 | Total Loss: 0.43 | Balanced Accuracy: 0.61
INFO:__main__:Best Balanced Accuracy Seen, validation/test: 0.72 0.68
!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!counter: 4, score: 0.6137908496732026, best_s
core: 0.6880392156862746
INFO:__main__:Epoch: 217 | Total Loss: 0.45 | Balanced Accuracy: 0.61
INFO:__main__:Best Balanced Accuracy Seen, validation/test: 0.72 0.68
!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!counter: 5, score: 0.6109150326797387, best_s
core: 0.6880392156862746
INFO:__main__:Epoch: 218 | Total Loss: 0.54 | Balanced Accuracy: 0.66
INFO:__main__:Best Balanced Accuracy Seen, validation/test: 0.72 0.68
!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!counter: 6, score: 0.6631372549019608, best_s
core: 0.6880392156862746
```

```
INFO:__main__:Epoch: 219 | Total Loss: 0.47 | Balanced Accuracy: 0.64
INFO:__main__:Best Balanced Accuracy Seen, validation/test: 0.72 0.68
!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!counter: 7, score: 0.6393464052287582, best_s
core: 0.6880392156862746
INFO:__main__:Epoch: 220 | Total Loss: 0.45 | Balanced Accuracy: 0.66
INFO:__main__:Best Balanced Accuracy Seen, validation/test: 0.72 0.68
!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!counter: 8, score: 0.6637254901960784, best_s
core: 0.6880392156862746
INFO:__main__:Epoch: 221 | Total Loss: 0.54 | Balanced Accuracy: 0.62
INFO:__main__:Best Balanced Accuracy Seen, validation/test: 0.72 0.68
!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!counter: 9, score: 0.6170588235294118, best_s
core: 0.6880392156862746
INFO:__main__:Epoch: 222 | Total Loss: 0.50 | Balanced Accuracy: 0.57
INFO:__main__:Best Balanced Accuracy Seen, validation/test: 0.72 0.68
!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!counter: 10, score: 0.5708496732026144, best_
score: 0.6880392156862746
INFO:__main__:Epoch: 223 | Total Loss: 0.49 | Balanced Accuracy: 0.60
INFO:__main__:Best Balanced Accuracy Seen, validation/test: 0.72 0.68
!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!counter: 11, score: 0.5973856209150327, best_
score: 0.6880392156862746
INFO:__main__:Epoch: 224 | Total Loss: 0.49 | Balanced Accuracy: 0.60
INFO:__main__:Best Balanced Accuracy Seen, validation/test: 0.72 0.68
!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!counter: 12, score: 0.5964705882352941, best_
score: 0.6880392156862746
INFO:__main__:Epoch: 225 | Total Loss: 0.46 | Balanced Accuracy: 0.58
INFO:__main__:Best Balanced Accuracy Seen, validation/test: 0.72 0.68
!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!counter: 13, score: 0.5826797385620915, best_
score: 0.6880392156862746
INFO:__main__:Epoch: 226 | Total Loss: 0.43 | Balanced Accuracy: 0.58
INFO:__main__:Best Balanced Accuracy Seen, validation/test: 0.72 0.68
!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!counter: 14, score: 0.5824183006535949, best_
score: 0.6880392156862746
INFO:__main__:Epoch: 227 | Total Loss: 0.44 | Balanced Accuracy: 0.65
INFO:__main__:Best Balanced Accuracy Seen, validation/test: 0.72 0.68
!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!counter: 15, score: 0.6460784313725491, best_
score: 0.6880392156862746
INFO:__main__:Epoch: 228 | Total Loss: 0.49 | Balanced Accuracy: 0.62
INFO:__main__:Best Balanced Accuracy Seen, validation/test: 0.72 0.68
!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!counter: 16, score: 0.6152287581699346, best_
score: 0.6880392156862746
INFO:__main__:Epoch: 229 | Total Loss: 0.44 | Balanced Accuracy: 0.65
INFO:__main__:Best Balanced Accuracy Seen, validation/test: 0.72 0.68
!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!counter: 17, score: 0.6511111111111111, best_
score: 0.6880392156862746
INFO:__main__:Epoch: 230 | Total Loss: 0.54 | Balanced Accuracy: 0.71
INFO:__main__:Best Balanced Accuracy Seen, validation/test: 0.72 0.68
!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!counter: 0, score: 0.7101307189542485, best_s
core: 0.7101307189542485
INFO:__main__:Epoch: 231 | Total Loss: 0.53 | Balanced Accuracy: 0.65
INFO:__main__:Best Balanced Accuracy Seen, validation/test: 0.72 0.68
!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!counter: 1, score: 0.654640522875817, best_sc
ore: 0.7101307189542485
INFO:__main__:Epoch: 232 | Total Loss: 0.44 | Balanced Accuracy: 0.60
INFO:__main__:Best Balanced Accuracy Seen, validation/test: 0.72 0.68
!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!counter: 2, score: 0.5952287581699346, best_s
core: 0.7101307189542485
```

```
INFO:__main__:Epoch: 233 | Total Loss: 0.46 | Balanced Accuracy: 0.62
INFO:__main__:Best Balanced Accuracy Seen, validation/test: 0.72 0.68
!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!counter: 3, score: 0.6201960784313726, best_s
core: 0.7101307189542485
INFO:__main__:Epoch: 234 | Total Loss: 0.50 | Balanced Accuracy: 0.64
INFO:__main__:Best Balanced Accuracy Seen, validation/test: 0.72 0.68
!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!counter: 4, score: 0.643202614379085, best_sc
ore: 0.7101307189542485
INFO:__main__:Epoch: 235 | Total Loss: 0.46 | Balanced Accuracy: 0.66
INFO:__main__:Best Balanced Accuracy Seen, validation/test: 0.72 0.68
!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!counter: 5, score: 0.6568627450980392, best_s
core: 0.7101307189542485
INFO:__main__:Epoch: 236 | Total Loss: 0.42 | Balanced Accuracy: 0.65
INFO:__main__:Best Balanced Accuracy Seen, validation/test: 0.72 0.68
!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!counter: 6, score: 0.6461437908496732, best_s
core: 0.7101307189542485
INFO:__main__:Epoch: 237 | Total Loss: 0.37 | Balanced Accuracy: 0.61
INFO:__main__:Best Balanced Accuracy Seen, validation/test: 0.72 0.68
!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!counter: 7, score: 0.6094771241830065, best_s
core: 0.7101307189542485
INFO:__main__:Epoch: 238 | Total Loss: 0.41 | Balanced Accuracy: 0.63
INFO:__main__:Best Balanced Accuracy Seen, validation/test: 0.72 0.68
!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!counter: 8, score: 0.6278431372549019, best_s
core: 0.7101307189542485
INFO:__main__:Epoch: 239 | Total Loss: 0.61 | Balanced Accuracy: 0.65
INFO:__main__:Best Balanced Accuracy Seen, validation/test: 0.72 0.68
!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!counter: 9, score: 0.6518300653594772, best_s
core: 0.7101307189542485
INFO:__main__:Epoch: 240 | Total Loss: 0.52 | Balanced Accuracy: 0.60
INFO:__main__:Best Balanced Accuracy Seen, validation/test: 0.72 0.68
!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!counter: 10, score: 0.5954901960784315, best_
score: 0.7101307189542485
INFO:__main__:Epoch: 241 | Total Loss: 0.54 | Balanced Accuracy: 0.61
INFO:__main__:Best Balanced Accuracy Seen, validation/test: 0.72 0.68
!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!counter: 11, score: 0.6127450980392157, best_
score: 0.7101307189542485
INFO:__main__:Epoch: 242 | Total Loss: 0.53 | Balanced Accuracy: 0.57
INFO:__main__:Best Balanced Accuracy Seen, validation/test: 0.72 0.68
!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!counter: 12, score: 0.573529411764706, best_s
core: 0.7101307189542485
INFO:__main__:Epoch: 243 | Total Loss: 0.50 | Balanced Accuracy: 0.64
INFO:__main__:Best Balanced Accuracy Seen, validation/test: 0.72 0.68
!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!counter: 13, score: 0.6428104575163398, best_
score: 0.7101307189542485
INFO:__main__:Epoch: 244 | Total Loss: 0.42 | Balanced Accuracy: 0.70
INFO:__main__:Best Balanced Accuracy Seen, validation/test: 0.72 0.68
!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!counter: 14, score: 0.7038562091503268, best_
score: 0.7101307189542485
INFO:__main__:Epoch: 245 | Total Loss: 0.49 | Balanced Accuracy: 0.67
INFO:__main__:Best Balanced Accuracy Seen, validation/test: 0.72 0.68
!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!counter: 15, score: 0.6722222222222222, best_
score: 0.7101307189542485
INFO:__main__:Epoch: 246 | Total Loss: 0.43 | Balanced Accuracy: 0.71
INFO:__main__:Best Balanced Accuracy Seen, validation/test: 0.72 0.68
!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!counter: 16, score: 0.7084967320261438, best_
score: 0.7101307189542485
```

```
INFO:__main__:Epoch: 247 | Total Loss: 0.41 | Balanced Accuracy: 0.69
INFO:__main__:Best Balanced Accuracy Seen, validation/test: 0.72 0.68
!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!counter: 17, score: 0.6875816993464053, best_
score: 0.7101307189542485
INFO:__main__:Epoch: 248 | Total Loss: 0.51 | Balanced Accuracy: 0.71
INFO:__main__:Best Balanced Accuracy Seen, validation/test: 0.72 0.68
!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!counter: 18, score: 0.7052941176470587, best_
score: 0.7101307189542485
INFO:__main__:Epoch: 249 | Total Loss: 0.44 | Balanced Accuracy: 0.62
INFO:__main__:Best Balanced Accuracy Seen, validation/test: 0.72 0.68
!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!counter: 19, score: 0.6150326797385621, best_
score: 0.7101307189542485
INFO:__main__:Epoch: 250 | Total Loss: 0.42 | Balanced Accuracy: 0.71
INFO:__main__:Best Balanced Accuracy Seen, validation/test: 0.72 0.68
!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!counter: 20, score: 0.7079084967320263, best_
score: 0.7101307189542485
INFO:__main__:Epoch: 251 | Total Loss: 0.52 | Balanced Accuracy: 0.68
INFO:__main__:Best Balanced Accuracy Seen, validation/test: 0.72 0.68
!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!counter: 21, score: 0.6836601307189542, best_
score: 0.7101307189542485
INFO:__main__:Epoch: 252 | Total Loss: 0.42 | Balanced Accuracy: 0.66
INFO:__main__:Best Balanced Accuracy Seen, validation/test: 0.72 0.68
!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!counter: 22, score: 0.6641176470588235, best_
score: 0.7101307189542485
INFO:__main__:Epoch: 253 | Total Loss: 0.53 | Balanced Accuracy: 0.69
INFO:__main__:Best Balanced Accuracy Seen, validation/test: 0.72 0.68
!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!counter: 23, score: 0.6871895424836602, best_
score: 0.7101307189542485
INFO:__main__:Epoch: 254 | Total Loss: 0.39 | Balanced Accuracy: 0.63
INFO:__main__:Best Balanced Accuracy Seen, validation/test: 0.72 0.68
!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!counter: 24, score: 0.6318300653594772, best_
score: 0.7101307189542485
INFO:__main__:Epoch: 255 | Total Loss: 0.43 | Balanced Accuracy: 0.65
INFO:__main__:Best Balanced Accuracy Seen, validation/test: 0.72 0.68
!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!counter: 25, score: 0.6549673202614379, best_
score: 0.7101307189542485
INFO:__main__:Epoch: 256 | Total Loss: 0.45 | Balanced Accuracy: 0.63
INFO:__main__:Best Balanced Accuracy Seen, validation/test: 0.72 0.68
!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!counter: 26, score: 0.6262091503267974, best_
score: 0.7101307189542485
INFO:__main__:Epoch: 257 | Total Loss: 0.45 | Balanced Accuracy: 0.65
INFO:__main__:Best Balanced Accuracy Seen, validation/test: 0.72 0.68
!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!counter: 27, score: 0.650718954248366, best_
score: 0.7101307189542485
INFO:__main__:Epoch: 258 | Total Loss: 0.43 | Balanced Accuracy: 0.65
INFO:__main__:Best Balanced Accuracy Seen, validation/test: 0.72 0.68
!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!counter: 28, score: 0.6520261437908497, best_
score: 0.7101307189542485
INFO:__main__:Epoch: 259 | Total Loss: 0.44 | Balanced Accuracy: 0.63
INFO:__main__:Best Balanced Accuracy Seen, validation/test: 0.72 0.68
!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!counter: 29, score: 0.6253594771241829, best_
score: 0.7101307189542485
INFO:__main__:Epoch: 260 | Total Loss: 0.39 | Balanced Accuracy: 0.67
INFO:__main__:Best Balanced Accuracy Seen, validation/test: 0.72 0.68
!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!counter: 30, score: 0.6677124183006535, best_
score: 0.7101307189542485
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INFO:__main__:Epoch: 261 | Total Loss: 0.45 | Balanced Accuracy: 0.65
INFO:__main__:Best Balanced Accuracy Seen, validation/test: 0.72 0.68
!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!counter: 31, score: 0.6455555555555555, best_
score: 0.7101307189542485
INFO:__main__:Epoch: 262 | Total Loss: 0.42 | Balanced Accuracy: 0.69
INFO:__main__:Best Balanced Accuracy Seen, validation/test: 0.72 0.68
!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!counter: 32, score: 0.6866666666666666, best_
score: 0.7101307189542485
INFO:__main__:Epoch: 263 | Total Loss: 0.43 | Balanced Accuracy: 0.71
INFO:__main__:Best Balanced Accuracy Seen, validation/test: 0.72 0.68
!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!counter: 33, score: 0.706797385620915, best_s
core: 0.7101307189542485
INFO:__main__:Epoch: 264 | Total Loss: 0.58 | Balanced Accuracy: 0.70
INFO:__main__:Best Balanced Accuracy Seen, validation/test: 0.72 0.68
!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!counter: 34, score: 0.7019607843137255, best_
score: 0.7101307189542485
INFO:__main__:Epoch: 265 | Total Loss: 0.57 | Balanced Accuracy: 0.53
INFO:__main__:Best Balanced Accuracy Seen, validation/test: 0.72 0.68
!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!counter: 35, score: 0.5318300653594772, best_
score: 0.7101307189542485
INFO:__main__:Epoch: 266 | Total Loss: 0.43 | Balanced Accuracy: 0.65
INFO:__main__:Best Balanced Accuracy Seen, validation/test: 0.72 0.68
!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!counter: 36, score: 0.6490849673202614, best_
score: 0.7101307189542485
INFO:__main__:Epoch: 267 | Total Loss: 0.49 | Balanced Accuracy: 0.63
INFO:__main__:Best Balanced Accuracy Seen, validation/test: 0.72 0.68
!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!counter: 37, score: 0.6300653594771242, best_
score: 0.7101307189542485
INFO:__main__:Epoch: 268 | Total Loss: 0.43 | Balanced Accuracy: 0.67
INFO:__main__:Best Balanced Accuracy Seen, validation/test: 0.72 0.68
!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!counter: 38, score: 0.665751633986928, best_s
core: 0.7101307189542485
INFO:__main__:Epoch: 269 | Total Loss: 0.45 | Balanced Accuracy: 0.66
INFO:__main__:Best Balanced Accuracy Seen, validation/test: 0.72 0.68
!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!counter: 39, score: 0.6627450980392157, best_
score: 0.7101307189542485
INFO:__main__:Epoch: 270 | Total Loss: 0.47 | Balanced Accuracy: 0.65
INFO:__main__:Best Balanced Accuracy Seen, validation/test: 0.72 0.68
!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!counter: 40, score: 0.6498039215686274, best_
score: 0.7101307189542485
INFO:__main__:Epoch: 271 | Total Loss: 0.52 | Balanced Accuracy: 0.67
INFO:__main__:Best Balanced Accuracy Seen, validation/test: 0.72 0.68
!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!counter: 41, score: 0.6661437908496732, best_
score: 0.7101307189542485
INFO:__main__:Epoch: 272 | Total Loss: 0.43 | Balanced Accuracy: 0.64
INFO:__main__:Best Balanced Accuracy Seen, validation/test: 0.72 0.68
!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!counter: 42, score: 0.6426143790849673, best_
score: 0.7101307189542485
INFO:__main__:Epoch: 273 | Total Loss: 0.43 | Balanced Accuracy: 0.67
INFO:__main__:Best Balanced Accuracy Seen, validation/test: 0.72 0.68
!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!counter: 43, score: 0.6666666666666666, best_
score: 0.7101307189542485
INFO:__main__:Epoch: 274 | Total Loss: 0.50 | Balanced Accuracy: 0.54
INFO:__main__:Best Balanced Accuracy Seen, validation/test: 0.72 0.68
!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!counter: 44, score: 0.5417647058823529, best_
score: 0.7101307189542485
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INFO:__main__:Epoch: 275 | Total Loss: 0.50 | Balanced Accuracy: 0.64
INFO:__main__:Best Balanced Accuracy Seen, validation/test: 0.72 0.68
!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!counter: 45, score: 0.638888888888889, best_score: 0.7101307189542485
INFO:__main__:Epoch: 276 | Total Loss: 0.46 | Balanced Accuracy: 0.65
INFO:__main__:Best Balanced Accuracy Seen, validation/test: 0.72 0.68
!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!counter: 46, score: 0.6515032679738563, best_score: 0.7101307189542485
INFO:__main__:Epoch: 277 | Total Loss: 0.45 | Balanced Accuracy: 0.66
INFO:__main__:Best Balanced Accuracy Seen, validation/test: 0.72 0.68
!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!counter: 47, score: 0.6560784313725491, best_score: 0.7101307189542485
INFO:__main__:Epoch: 278 | Total Loss: 0.52 | Balanced Accuracy: 0.64
INFO:__main__:Best Balanced Accuracy Seen, validation/test: 0.72 0.68
!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!counter: 48, score: 0.6361437908496732, best_score: 0.7101307189542485
INFO:__main__:Epoch: 279 | Total Loss: 0.46 | Balanced Accuracy: 0.65
INFO:__main__:Best Balanced Accuracy Seen, validation/test: 0.72 0.68
!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!counter: 49, score: 0.65, best_score: 0.7101307189542485
INFO:__main__:Epoch: 280 | Total Loss: 0.48 | Balanced Accuracy: 0.62
INFO:__main__:Best Balanced Accuracy Seen, validation/test: 0.72 0.68
!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!counter: 50, score: 0.623333333333334, best_score: 0.7101307189542485
INFO:__main__:Epoch: 281 | Total Loss: 0.44 | Balanced Accuracy: 0.60
INFO:__main__:Best Balanced Accuracy Seen, validation/test: 0.72 0.68
!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!counter: 51, score: 0.6042483660130719, best_score: 0.7101307189542485
INFO:__main__:Epoch: 282 | Total Loss: 0.47 | Balanced Accuracy: 0.64
INFO:__main__:Best Balanced Accuracy Seen, validation/test: 0.72 0.68
!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!counter: 52, score: 0.6357516339869281, best_score: 0.7101307189542485
INFO:__main__:Epoch: 283 | Total Loss: 0.48 | Balanced Accuracy: 0.62
INFO:__main__:Best Balanced Accuracy Seen, validation/test: 0.72 0.68
!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!counter: 53, score: 0.6170588235294118, best_score: 0.7101307189542485
INFO:__main__:Epoch: 284 | Total Loss: 0.52 | Balanced Accuracy: 0.62
INFO:__main__:Best Balanced Accuracy Seen, validation/test: 0.72 0.68
!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!counter: 54, score: 0.6247058823529411, best_score: 0.7101307189542485
INFO:__main__:Epoch: 285 | Total Loss: 0.45 | Balanced Accuracy: 0.55
INFO:__main__:Best Balanced Accuracy Seen, validation/test: 0.72 0.68
!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!counter: 55, score: 0.5501960784313725, best_score: 0.7101307189542485
INFO:__main__:Epoch: 286 | Total Loss: 0.51 | Balanced Accuracy: 0.61
INFO:__main__:Best Balanced Accuracy Seen, validation/test: 0.72 0.68
!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!counter: 56, score: 0.6052287581699346, best_score: 0.7101307189542485
INFO:__main__:Epoch: 287 | Total Loss: 0.41 | Balanced Accuracy: 0.64
INFO:__main__:Best Balanced Accuracy Seen, validation/test: 0.72 0.68
!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!counter: 57, score: 0.6396732026143791, best_score: 0.7101307189542485
INFO:__main__:Epoch: 288 | Total Loss: 0.42 | Balanced Accuracy: 0.64
INFO:__main__:Best Balanced Accuracy Seen, validation/test: 0.72 0.68
!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!counter: 58, score: 0.6405882352941177, best_score: 0.7101307189542485
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INFO:__main__:Epoch: 289 | Total Loss: 0.40 | Balanced Accuracy: 0.60
INFO:__main__:Best Balanced Accuracy Seen, validation/test: 0.72 0.68
!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!counter: 59, score: 0.6048366013071895, best_
score: 0.7101307189542485
INFO:__main__:Epoch: 290 | Total Loss: 0.43 | Balanced Accuracy: 0.59
INFO:__main__:Best Balanced Accuracy Seen, validation/test: 0.72 0.68
!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!counter: 60, score: 0.5901960784313726, best_
score: 0.7101307189542485
INFO:__main__:Epoch: 291 | Total Loss: 0.55 | Balanced Accuracy: 0.61
INFO:__main__:Best Balanced Accuracy Seen, validation/test: 0.72 0.68
!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!counter: 61, score: 0.6081045751633988, best_
score: 0.7101307189542485
INFO:__main__:Epoch: 292 | Total Loss: 0.58 | Balanced Accuracy: 0.67
INFO:__main__:Best Balanced Accuracy Seen, validation/test: 0.72 0.68
!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!counter: 62, score: 0.6721568627450981, best_
score: 0.7101307189542485
INFO:__main__:Epoch: 293 | Total Loss: 0.50 | Balanced Accuracy: 0.63
INFO:__main__:Best Balanced Accuracy Seen, validation/test: 0.72 0.68
!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!counter: 63, score: 0.6318300653594772, best_
score: 0.7101307189542485
INFO:__main__:Epoch: 294 | Total Loss: 0.53 | Balanced Accuracy: 0.58
INFO:__main__:Best Balanced Accuracy Seen, validation/test: 0.72 0.68
!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!counter: 64, score: 0.5801960784313726, best_
score: 0.7101307189542485
INFO:__main__:Epoch: 295 | Total Loss: 0.50 | Balanced Accuracy: 0.63
INFO:__main__:Best Balanced Accuracy Seen, validation/test: 0.72 0.68
!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!counter: 65, score: 0.6342483660130719, best_
score: 0.7101307189542485
INFO:__main__:Epoch: 296 | Total Loss: 0.45 | Balanced Accuracy: 0.65
INFO:__main__:Best Balanced Accuracy Seen, validation/test: 0.72 0.68
!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!counter: 66, score: 0.6488235294117647, best_
score: 0.7101307189542485
INFO:__main__:Epoch: 297 | Total Loss: 0.46 | Balanced Accuracy: 0.64
INFO:__main__:Best Balanced Accuracy Seen, validation/test: 0.72 0.68
!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!counter: 67, score: 0.6433333333333334, best_
score: 0.7101307189542485
INFO:__main__:Epoch: 298 | Total Loss: 0.45 | Balanced Accuracy: 0.65
INFO:__main__:Best Balanced Accuracy Seen, validation/test: 0.72 0.68
!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!counter: 68, score: 0.6455555555555555, best_
score: 0.7101307189542485
INFO:__main__:Epoch: 299 | Total Loss: 0.51 | Balanced Accuracy: 0.64
INFO:__main__:Best Balanced Accuracy Seen, validation/test: 0.72 0.68
!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!counter: 69, score: 0.6440522875816993, best_
score: 0.7101307189542485
INFO:__main__:Epoch: 300 | Total Loss: 0.59 | Balanced Accuracy: 0.61
INFO:__main__:Best Balanced Accuracy Seen, validation/test: 0.72 0.68
!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!counter: 70, score: 0.6077124183006536, best_
score: 0.7101307189542485
INFO:__main__:Epoch: 301 | Total Loss: 0.48 | Balanced Accuracy: 0.57
INFO:__main__:Best Balanced Accuracy Seen, validation/test: 0.72 0.68
!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!counter: 71, score: 0.5724183006535948, best_
score: 0.7101307189542485
INFO:__main__:Epoch: 302 | Total Loss: 0.44 | Balanced Accuracy: 0.65
INFO:__main__:Best Balanced Accuracy Seen, validation/test: 0.72 0.68
!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!counter: 72, score: 0.6505228758169935, best_
score: 0.7101307189542485
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INFO:__main__:Epoch: 303 | Total Loss: 0.49 | Balanced Accuracy: 0.57
INFO:__main__:Best Balanced Accuracy Seen, validation/test: 0.72 0.68
!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!counter: 73, score: 0.5680392156862745, best_
score: 0.7101307189542485
INFO:__main__:Epoch: 304 | Total Loss: 0.44 | Balanced Accuracy: 0.58
INFO:__main__:Best Balanced Accuracy Seen, validation/test: 0.72 0.68
!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!counter: 74, score: 0.5824183006535949, best_
score: 0.7101307189542485
INFO:__main__:Epoch: 305 | Total Loss: 0.45 | Balanced Accuracy: 0.64
INFO:__main__:Best Balanced Accuracy Seen, validation/test: 0.72 0.68
!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!counter: 75, score: 0.6398039215686274, best_
score: 0.7101307189542485
INFO:__main__:Epoch: 306 | Total Loss: 0.47 | Balanced Accuracy: 0.58
INFO:__main__:Best Balanced Accuracy Seen, validation/test: 0.72 0.68
!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!counter: 76, score: 0.5759477124183007, best_
score: 0.7101307189542485
INFO:__main__:Epoch: 307 | Total Loss: 0.48 | Balanced Accuracy: 0.57
INFO:__main__:Best Balanced Accuracy Seen, validation/test: 0.72 0.68
!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!counter: 77, score: 0.568562091503268, best_s
core: 0.7101307189542485
INFO:__main__:Epoch: 308 | Total Loss: 0.42 | Balanced Accuracy: 0.64
INFO:__main__:Best Balanced Accuracy Seen, validation/test: 0.72 0.68
!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!counter: 78, score: 0.64, best_score: 0.71013
07189542485
INFO:__main__:Epoch: 309 | Total Loss: 0.44 | Balanced Accuracy: 0.63
INFO:__main__:Best Balanced Accuracy Seen, validation/test: 0.72 0.68
!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!counter: 79, score: 0.6269281045751635, best_
score: 0.7101307189542485
INFO:__main__:Epoch: 310 | Total Loss: 0.44 | Balanced Accuracy: 0.58
INFO:__main__:Best Balanced Accuracy Seen, validation/test: 0.72 0.68
!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!counter: 80, score: 0.5837254901960784, best_
score: 0.7101307189542485
INFO:__main__:Epoch: 311 | Total Loss: 0.49 | Balanced Accuracy: 0.58
INFO:__main__:Best Balanced Accuracy Seen, validation/test: 0.72 0.68
!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!counter: 81, score: 0.5844444444444444, best_
score: 0.7101307189542485
INFO:__main__:Epoch: 312 | Total Loss: 0.56 | Balanced Accuracy: 0.59
INFO:__main__:Best Balanced Accuracy Seen, validation/test: 0.72 0.68
!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!counter: 82, score: 0.5887581699346405, best_
score: 0.7101307189542485
INFO:__main__:Epoch: 313 | Total Loss: 0.50 | Balanced Accuracy: 0.63
INFO:__main__:Best Balanced Accuracy Seen, validation/test: 0.72 0.68
!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!counter: 83, score: 0.625686274509804, best_s
core: 0.7101307189542485
INFO:__main__:Epoch: 314 | Total Loss: 0.47 | Balanced Accuracy: 0.61
INFO:__main__:Best Balanced Accuracy Seen, validation/test: 0.72 0.68
!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!counter: 84, score: 0.607450980392157, best_s
core: 0.7101307189542485
INFO:__main__:Epoch: 315 | Total Loss: 0.44 | Balanced Accuracy: 0.64
INFO:__main__:Best Balanced Accuracy Seen, validation/test: 0.72 0.68
!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!counter: 85, score: 0.6359477124183006, best_
score: 0.7101307189542485
INFO:__main__:Epoch: 316 | Total Loss: 0.42 | Balanced Accuracy: 0.67
INFO:__main__:Best Balanced Accuracy Seen, validation/test: 0.72 0.68
!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!counter: 86, score: 0.6656209150326798, best_
score: 0.7101307189542485
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INFO:__main__:Epoch: 317 | Total Loss: 0.53 | Balanced Accuracy: 0.59
INFO:__main__:Best Balanced Accuracy Seen, validation/test: 0.72 0.68
!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!counter: 87, score: 0.5879738562091504, best_
score: 0.7101307189542485
INFO:__main__:Epoch: 318 | Total Loss: 0.48 | Balanced Accuracy: 0.64
INFO:__main__:Best Balanced Accuracy Seen, validation/test: 0.72 0.68
!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!counter: 88, score: 0.6379738562091503, best_
score: 0.7101307189542485
INFO:__main__:Epoch: 319 | Total Loss: 0.51 | Balanced Accuracy: 0.64
INFO:__main__:Best Balanced Accuracy Seen, validation/test: 0.72 0.68
!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!counter: 89, score: 0.6365359477124183, best_
score: 0.7101307189542485
INFO:__main__:Epoch: 320 | Total Loss: 0.46 | Balanced Accuracy: 0.65
INFO:__main__:Best Balanced Accuracy Seen, validation/test: 0.72 0.68
!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!counter: 90, score: 0.6465359477124183, best_
score: 0.7101307189542485
INFO:__main__:Epoch: 321 | Total Loss: 0.53 | Balanced Accuracy: 0.66
INFO:__main__:Best Balanced Accuracy Seen, validation/test: 0.72 0.68
!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!counter: 91, score: 0.6579084967320262, best_
score: 0.7101307189542485
INFO:__main__:Epoch: 322 | Total Loss: 0.60 | Balanced Accuracy: 0.67
INFO:__main__:Best Balanced Accuracy Seen, validation/test: 0.72 0.68
!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!counter: 92, score: 0.6721568627450981, best_
score: 0.7101307189542485
INFO:__main__:Epoch: 323 | Total Loss: 0.61 | Balanced Accuracy: 0.63
INFO:__main__:Best Balanced Accuracy Seen, validation/test: 0.72 0.68
!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!counter: 93, score: 0.6333333333333333, best_
score: 0.7101307189542485
INFO:__main__:Epoch: 324 | Total Loss: 0.48 | Balanced Accuracy: 0.58
INFO:__main__:Best Balanced Accuracy Seen, validation/test: 0.72 0.68
!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!counter: 94, score: 0.5752287581699346, best_
score: 0.7101307189542485
INFO:__main__:Epoch: 325 | Total Loss: 0.46 | Balanced Accuracy: 0.67
INFO:__main__:Best Balanced Accuracy Seen, validation/test: 0.72 0.68
!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!counter: 95, score: 0.6711764705882354, best_
score: 0.7101307189542485
INFO:__main__:Epoch: 326 | Total Loss: 0.47 | Balanced Accuracy: 0.66
INFO:__main__:Best Balanced Accuracy Seen, validation/test: 0.72 0.68
!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!counter: 96, score: 0.6590849673202613, best_
score: 0.7101307189542485
INFO:__main__:Epoch: 327 | Total Loss: 0.52 | Balanced Accuracy: 0.59
INFO:__main__:Best Balanced Accuracy Seen, validation/test: 0.72 0.68
!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!counter: 97, score: 0.5941176470588235, best_
score: 0.7101307189542485
INFO:__main__:Epoch: 328 | Total Loss: 0.58 | Balanced Accuracy: 0.67
INFO:__main__:Best Balanced Accuracy Seen, validation/test: 0.72 0.68
!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!counter: 98, score: 0.6701960784313726, best_
score: 0.7101307189542485
INFO:__main__:Epoch: 329 | Total Loss: 0.53 | Balanced Accuracy: 0.65
INFO:__main__:Best Balanced Accuracy Seen, validation/test: 0.72 0.68
!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!counter: 99, score: 0.6485620915032679, best_
score: 0.7101307189542485
INFO:__main__:Epoch: 330 | Total Loss: 0.54 | Balanced Accuracy: 0.64
INFO:__main__:Best Balanced Accuracy Seen, validation/test: 0.72 0.68
!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!counter: 100, score: 0.6419607843137255, best_
score: 0.7101307189542485
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INFO:__main__:Epoch: 331 | Total Loss: 0.47 | Balanced Accuracy: 0.66
INFO:__main__:Best Balanced Accuracy Seen, validation/test: 0.72 0.68
!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!counter: 101, score: 0.6620261437908497, best
_score: 0.7101307189542485
INFO:__main__:Epoch: 332 | Total Loss: 0.48 | Balanced Accuracy: 0.61
INFO:__main__:Best Balanced Accuracy Seen, validation/test: 0.72 0.68
!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!counter: 102, score: 0.6109150326797387, best
_score: 0.7101307189542485
INFO:__main__:Epoch: 333 | Total Loss: 0.44 | Balanced Accuracy: 0.63
INFO:__main__:Best Balanced Accuracy Seen, validation/test: 0.72 0.68
!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!counter: 103, score: 0.6311111111111111, best
_score: 0.7101307189542485
INFO:__main__:Epoch: 334 | Total Loss: 0.48 | Balanced Accuracy: 0.65
INFO:__main__:Best Balanced Accuracy Seen, validation/test: 0.72 0.68
!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!counter: 104, score: 0.6518954248366012, best
_score: 0.7101307189542485
INFO:__main__:Epoch: 335 | Total Loss: 0.57 | Balanced Accuracy: 0.57
INFO:__main__:Best Balanced Accuracy Seen, validation/test: 0.72 0.68
!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!counter: 105, score: 0.5697385620915033, best
_score: 0.7101307189542485
INFO:__main__:Epoch: 336 | Total Loss: 0.48 | Balanced Accuracy: 0.65
INFO:__main__:Best Balanced Accuracy Seen, validation/test: 0.72 0.68
!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!counter: 106, score: 0.6470588235294118, best
_score: 0.7101307189542485
INFO:__main__:Epoch: 337 | Total Loss: 0.52 | Balanced Accuracy: 0.64
INFO:__main__:Best Balanced Accuracy Seen, validation/test: 0.72 0.68
!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!counter: 107, score: 0.6442483660130719, best
_score: 0.7101307189542485
INFO:__main__:Epoch: 338 | Total Loss: 0.48 | Balanced Accuracy: 0.66
INFO:__main__:Best Balanced Accuracy Seen, validation/test: 0.72 0.68
!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!counter: 108, score: 0.6611111111111111, best
_score: 0.7101307189542485
INFO:__main__:Epoch: 339 | Total Loss: 0.51 | Balanced Accuracy: 0.64
INFO:__main__:Best Balanced Accuracy Seen, validation/test: 0.72 0.68
!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!counter: 109, score: 0.6367320261437909, best
_score: 0.7101307189542485
INFO:__main__:Epoch: 340 | Total Loss: 0.45 | Balanced Accuracy: 0.65
INFO:__main__:Best Balanced Accuracy Seen, validation/test: 0.72 0.68
!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!counter: 110, score: 0.6484967320261438, best
_score: 0.7101307189542485
INFO:__main__:Epoch: 341 | Total Loss: 0.50 | Balanced Accuracy: 0.69
INFO:__main__:Best Balanced Accuracy Seen, validation/test: 0.72 0.68
!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!counter: 111, score: 0.688888888888889, best
_score: 0.7101307189542485
INFO:__main__:Epoch: 342 | Total Loss: 0.56 | Balanced Accuracy: 0.67
INFO:__main__:Best Balanced Accuracy Seen, validation/test: 0.72 0.68
!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!counter: 112, score: 0.6699346405228758, best
_score: 0.7101307189542485
INFO:__main__:Epoch: 343 | Total Loss: 0.45 | Balanced Accuracy: 0.60
INFO:__main__:Best Balanced Accuracy Seen, validation/test: 0.72 0.68
!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!counter: 113, score: 0.6033986928104574, best
_score: 0.7101307189542485
INFO:__main__:Epoch: 344 | Total Loss: 0.42 | Balanced Accuracy: 0.63
INFO:__main__:Best Balanced Accuracy Seen, validation/test: 0.72 0.68
!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!counter: 114, score: 0.6279738562091502, best
_score: 0.7101307189542485
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INFO:__main__:Epoch: 345 | Total Loss: 0.49 | Balanced Accuracy: 0.59
INFO:__main__:Best Balanced Accuracy Seen, validation/test: 0.72 0.68
!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!counter: 115, score: 0.590718954248366, best_
score: 0.7101307189542485
INFO:__main__:Epoch: 346 | Total Loss: 0.50 | Balanced Accuracy: 0.68
INFO:__main__:Best Balanced Accuracy Seen, validation/test: 0.72 0.68
!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!counter: 116, score: 0.6845751633986928, best
_score: 0.7101307189542485
INFO:__main__:Epoch: 347 | Total Loss: 0.54 | Balanced Accuracy: 0.69
INFO:__main__:Best Balanced Accuracy Seen, validation/test: 0.72 0.68
!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!counter: 117, score: 0.6852941176470587, best
_score: 0.7101307189542485
INFO:__main__:Epoch: 348 | Total Loss: 0.43 | Balanced Accuracy: 0.72
INFO:__main__:Best Balanced Accuracy Seen, validation/test: 0.72 0.68
!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!counter: 0, score: 0.7208496732026144, best_s
core: 0.7208496732026144
INFO:__main__:Epoch: 349 | Total Loss: 0.60 | Balanced Accuracy: 0.67
INFO:__main__:Best Balanced Accuracy Seen, validation/test: 0.72 0.68
!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!counter: 1, score: 0.6721568627450981, best_s
core: 0.7208496732026144
INFO:__main__:Epoch: 350 | Total Loss: 0.48 | Balanced Accuracy: 0.68
INFO:__main__:Best Balanced Accuracy Seen, validation/test: 0.72 0.68
!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!counter: 2, score: 0.6840522875816993, best_s
core: 0.7208496732026144
INFO:__main__:Epoch: 351 | Total Loss: 0.47 | Balanced Accuracy: 0.66
INFO:__main__:Best Balanced Accuracy Seen, validation/test: 0.72 0.68
!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!counter: 3, score: 0.6592810457516339, best_s
core: 0.7208496732026144
INFO:__main__:Epoch: 352 | Total Loss: 0.45 | Balanced Accuracy: 0.68
INFO:__main__:Best Balanced Accuracy Seen, validation/test: 0.72 0.68
!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!counter: 4, score: 0.683333333333332, best_s
core: 0.7208496732026144
INFO:__main__:Epoch: 353 | Total Loss: 0.43 | Balanced Accuracy: 0.61
INFO:__main__:Best Balanced Accuracy Seen, validation/test: 0.72 0.68
!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!counter: 5, score: 0.6137254901960784, best_s
core: 0.7208496732026144
INFO:__main__:Epoch: 354 | Total Loss: 0.49 | Balanced Accuracy: 0.63
INFO:__main__:Best Balanced Accuracy Seen, validation/test: 0.72 0.68
!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!counter: 6, score: 0.6311764705882353, best_s
core: 0.7208496732026144
INFO:__main__:Epoch: 355 | Total Loss: 0.53 | Balanced Accuracy: 0.68
INFO:__main__:Best Balanced Accuracy Seen, validation/test: 0.72 0.68
!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!counter: 7, score: 0.6752941176470588, best_s
core: 0.7208496732026144
INFO:__main__:Epoch: 356 | Total Loss: 0.43 | Balanced Accuracy: 0.69
INFO:__main__:Best Balanced Accuracy Seen, validation/test: 0.72 0.68
!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!counter: 8, score: 0.6875816993464053, best_s
core: 0.7208496732026144
INFO:__main__:Epoch: 357 | Total Loss: 0.47 | Balanced Accuracy: 0.70
INFO:__main__:Best Balanced Accuracy Seen, validation/test: 0.72 0.68
!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!counter: 9, score: 0.7009150326797385, best_s
core: 0.7208496732026144
INFO:__main__:Epoch: 358 | Total Loss: 0.46 | Balanced Accuracy: 0.61
INFO:__main__:Best Balanced Accuracy Seen, validation/test: 0.72 0.68
!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!counter: 10, score: 0.6113071895424836, best_
score: 0.7208496732026144
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INFO:__main__:Epoch: 359 | Total Loss: 0.45 | Balanced Accuracy: 0.63
INFO:__main__:Best Balanced Accuracy Seen, validation/test: 0.72 0.68
!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!counter: 11, score: 0.6284313725490197, best_
score: 0.7208496732026144
INFO:__main__:Epoch: 360 | Total Loss: 0.54 | Balanced Accuracy: 0.64
INFO:__main__:Best Balanced Accuracy Seen, validation/test: 0.72 0.68
!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!counter: 12, score: 0.6443790849673202, best_
score: 0.7208496732026144
INFO:__main__:Epoch: 361 | Total Loss: 0.46 | Balanced Accuracy: 0.68
INFO:__main__:Best Balanced Accuracy Seen, validation/test: 0.72 0.68
!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!counter: 13, score: 0.6807189542483659, best_
score: 0.7208496732026144
INFO:__main__:Epoch: 362 | Total Loss: 0.47 | Balanced Accuracy: 0.62
INFO:__main__:Best Balanced Accuracy Seen, validation/test: 0.72 0.68
!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!counter: 14, score: 0.615359477124183, best_s
core: 0.7208496732026144
INFO:__main__:Epoch: 363 | Total Loss: 0.44 | Balanced Accuracy: 0.67
INFO:__main__:Best Balanced Accuracy Seen, validation/test: 0.72 0.68
!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!counter: 15, score: 0.671764705882353, best_s
core: 0.7208496732026144
INFO:__main__:Epoch: 364 | Total Loss: 0.53 | Balanced Accuracy: 0.62
INFO:__main__:Best Balanced Accuracy Seen, validation/test: 0.72 0.68
!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!counter: 16, score: 0.6184967320261437, best_
score: 0.7208496732026144
INFO:__main__:Epoch: 365 | Total Loss: 0.46 | Balanced Accuracy: 0.60
INFO:__main__:Best Balanced Accuracy Seen, validation/test: 0.72 0.68
!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!counter: 17, score: 0.5966666666666667, best_
score: 0.7208496732026144
INFO:__main__:Epoch: 366 | Total Loss: 0.45 | Balanced Accuracy: 0.68
INFO:__main__:Best Balanced Accuracy Seen, validation/test: 0.72 0.68
!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!counter: 18, score: 0.6813071895424837, best_
score: 0.7208496732026144
INFO:__main__:Epoch: 367 | Total Loss: 0.48 | Balanced Accuracy: 0.66
INFO:__main__:Best Balanced Accuracy Seen, validation/test: 0.72 0.68
!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!counter: 19, score: 0.6575816993464053, best_
score: 0.7208496732026144
INFO:__main__:Epoch: 368 | Total Loss: 0.47 | Balanced Accuracy: 0.69
INFO:__main__:Best Balanced Accuracy Seen, validation/test: 0.72 0.68
!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!counter: 20, score: 0.690718954248366, best_s
core: 0.7208496732026144
INFO:__main__:Epoch: 369 | Total Loss: 0.44 | Balanced Accuracy: 0.68
INFO:__main__:Best Balanced Accuracy Seen, validation/test: 0.72 0.68
!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!counter: 21, score: 0.6763398692810457, best_
score: 0.7208496732026144
INFO:__main__:Epoch: 370 | Total Loss: 0.49 | Balanced Accuracy: 0.65
INFO:__main__:Best Balanced Accuracy Seen, validation/test: 0.72 0.68
!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!counter: 22, score: 0.6516993464052288, best_
score: 0.7208496732026144
INFO:__main__:Epoch: 371 | Total Loss: 0.61 | Balanced Accuracy: 0.69
INFO:__main__:Best Balanced Accuracy Seen, validation/test: 0.72 0.68
!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!counter: 23, score: 0.6863398692810457, best_
score: 0.7208496732026144
INFO:__main__:Epoch: 372 | Total Loss: 0.50 | Balanced Accuracy: 0.68
INFO:__main__:Best Balanced Accuracy Seen, validation/test: 0.72 0.68
!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!counter: 24, score: 0.6751633986928104, best_
score: 0.7208496732026144
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INFO:__main__:Epoch: 373 | Total Loss: 0.45 | Balanced Accuracy: 0.66
INFO:__main__:Best Balanced Accuracy Seen, validation/test: 0.72 0.68
!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!counter: 25, score: 0.6590849673202613, best_
score: 0.7208496732026144
INFO:__main__:Epoch: 374 | Total Loss: 0.45 | Balanced Accuracy: 0.67
INFO:__main__:Best Balanced Accuracy Seen, validation/test: 0.72 0.68
!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!counter: 26, score: 0.6716339869281045, best_
score: 0.7208496732026144
INFO:__main__:Epoch: 375 | Total Loss: 0.47 | Balanced Accuracy: 0.58
INFO:__main__:Best Balanced Accuracy Seen, validation/test: 0.72 0.68
!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!counter: 27, score: 0.5772549019607843, best_
score: 0.7208496732026144
INFO:__main__:Epoch: 376 | Total Loss: 0.49 | Balanced Accuracy: 0.54
INFO:__main__:Best Balanced Accuracy Seen, validation/test: 0.72 0.68
!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!counter: 28, score: 0.536078431372549, best_s
core: 0.7208496732026144
INFO:__main__:Epoch: 377 | Total Loss: 0.61 | Balanced Accuracy: 0.65
INFO:__main__:Best Balanced Accuracy Seen, validation/test: 0.72 0.68
!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!counter: 29, score: 0.6462745098039215, best_
score: 0.7208496732026144
INFO:__main__:Epoch: 378 | Total Loss: 0.54 | Balanced Accuracy: 0.64
INFO:__main__:Best Balanced Accuracy Seen, validation/test: 0.72 0.68
!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!counter: 30, score: 0.6437908496732027, best_
score: 0.7208496732026144
INFO:__main__:Epoch: 379 | Total Loss: 0.60 | Balanced Accuracy: 0.64
INFO:__main__:Best Balanced Accuracy Seen, validation/test: 0.72 0.68
!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!counter: 31, score: 0.6370588235294118, best_
score: 0.7208496732026144
INFO:__main__:Epoch: 380 | Total Loss: 0.50 | Balanced Accuracy: 0.62
INFO:__main__:Best Balanced Accuracy Seen, validation/test: 0.72 0.68
!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!counter: 32, score: 0.6187581699346406, best_
score: 0.7208496732026144
INFO:__main__:Epoch: 381 | Total Loss: 0.50 | Balanced Accuracy: 0.66
INFO:__main__:Best Balanced Accuracy Seen, validation/test: 0.72 0.68
!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!counter: 33, score: 0.6574509803921568, best_
score: 0.7208496732026144
INFO:__main__:Epoch: 382 | Total Loss: 0.50 | Balanced Accuracy: 0.65
INFO:__main__:Best Balanced Accuracy Seen, validation/test: 0.72 0.68
!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!counter: 34, score: 0.6512418300653594, best_
score: 0.7208496732026144
INFO:__main__:Epoch: 383 | Total Loss: 0.45 | Balanced Accuracy: 0.64
INFO:__main__:Best Balanced Accuracy Seen, validation/test: 0.72 0.68
!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!counter: 35, score: 0.6364705882352941, best_
score: 0.7208496732026144
INFO:__main__:Epoch: 384 | Total Loss: 0.50 | Balanced Accuracy: 0.57
INFO:__main__:Best Balanced Accuracy Seen, validation/test: 0.72 0.68
!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!counter: 36, score: 0.5724183006535948, best_
score: 0.7208496732026144
INFO:__main__:Epoch: 385 | Total Loss: 0.52 | Balanced Accuracy: 0.68
INFO:__main__:Best Balanced Accuracy Seen, validation/test: 0.72 0.68
!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!counter: 37, score: 0.6774509803921568, best_
score: 0.7208496732026144
INFO:__main__:Epoch: 386 | Total Loss: 0.50 | Balanced Accuracy: 0.59
INFO:__main__:Best Balanced Accuracy Seen, validation/test: 0.72 0.68
!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!counter: 38, score: 0.5918300653594771, best_
score: 0.7208496732026144
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INFO:__main__:Epoch: 387 | Total Loss: 0.46 | Balanced Accuracy: 0.68
INFO:__main__:Best Balanced Accuracy Seen, validation/test: 0.72 0.68
!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!counter: 39, score: 0.676470588235294, best_s
core: 0.7208496732026144
INFO:__main__:Epoch: 388 | Total Loss: 0.53 | Balanced Accuracy: 0.64
INFO:__main__:Best Balanced Accuracy Seen, validation/test: 0.72 0.68
!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!counter: 40, score: 0.6426143790849673, best_
score: 0.7208496732026144
INFO:__main__:Epoch: 389 | Total Loss: 0.52 | Balanced Accuracy: 0.60
INFO:__main__:Best Balanced Accuracy Seen, validation/test: 0.72 0.68
!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!counter: 41, score: 0.6024183006535947, best_
score: 0.7208496732026144
INFO:__main__:Epoch: 390 | Total Loss: 0.53 | Balanced Accuracy: 0.60
INFO:__main__:Best Balanced Accuracy Seen, validation/test: 0.72 0.68
!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!counter: 42, score: 0.5977777777777779, best_
score: 0.7208496732026144
INFO:__main__:Epoch: 391 | Total Loss: 0.50 | Balanced Accuracy: 0.60
INFO:__main__:Best Balanced Accuracy Seen, validation/test: 0.72 0.68
!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!counter: 43, score: 0.602156862745098, best_s
core: 0.7208496732026144
INFO:__main__:Epoch: 392 | Total Loss: 0.56 | Balanced Accuracy: 0.66
INFO:__main__:Best Balanced Accuracy Seen, validation/test: 0.72 0.68
!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!counter: 44, score: 0.6600653594771242, best_
score: 0.7208496732026144
INFO:__main__:Epoch: 393 | Total Loss: 0.47 | Balanced Accuracy: 0.64
INFO:__main__:Best Balanced Accuracy Seen, validation/test: 0.72 0.68
!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!counter: 45, score: 0.6433333333333334, best_
score: 0.7208496732026144
INFO:__main__:Epoch: 394 | Total Loss: 0.53 | Balanced Accuracy: 0.67
INFO:__main__:Best Balanced Accuracy Seen, validation/test: 0.72 0.68
!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!counter: 46, score: 0.6733986928104576, best_
score: 0.7208496732026144
INFO:__main__:Epoch: 395 | Total Loss: 0.47 | Balanced Accuracy: 0.68
INFO:__main__:Best Balanced Accuracy Seen, validation/test: 0.72 0.68
!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!counter: 47, score: 0.6759477124183007, best_
score: 0.7208496732026144
INFO:__main__:Epoch: 396 | Total Loss: 0.52 | Balanced Accuracy: 0.60
INFO:__main__:Best Balanced Accuracy Seen, validation/test: 0.72 0.68
!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!counter: 48, score: 0.6042483660130719, best_
score: 0.7208496732026144
INFO:__main__:Epoch: 397 | Total Loss: 0.47 | Balanced Accuracy: 0.65
INFO:__main__:Best Balanced Accuracy Seen, validation/test: 0.72 0.68
!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!counter: 49, score: 0.6491503267973856, best_
score: 0.7208496732026144
INFO:__main__:Epoch: 398 | Total Loss: 0.49 | Balanced Accuracy: 0.64
INFO:__main__:Best Balanced Accuracy Seen, validation/test: 0.72 0.68
!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!counter: 50, score: 0.6401307189542483, best_
score: 0.7208496732026144
INFO:__main__:Epoch: 399 | Total Loss: 0.52 | Balanced Accuracy: 0.66
INFO:__main__:Best Balanced Accuracy Seen, validation/test: 0.72 0.68
!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!counter: 51, score: 0.6601960784313725, best_
score: 0.7208496732026144
INFO:__main__:Epoch: 400 | Total Loss: 0.47 | Balanced Accuracy: 0.65
INFO:__main__:Best Balanced Accuracy Seen, validation/test: 0.72 0.68
!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!counter: 52, score: 0.6490849673202614, best_
score: 0.7208496732026144
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INFO:__main__:Epoch: 401 | Total Loss: 0.54 | Balanced Accuracy: 0.64
INFO:__main__:Best Balanced Accuracy Seen, validation/test: 0.72 0.68
!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!counter: 53, score: 0.6389542483660131, best_
score: 0.7208496732026144
INFO:__main__:Epoch: 402 | Total Loss: 0.55 | Balanced Accuracy: 0.72
INFO:__main__:Best Balanced Accuracy Seen, validation/test: 0.72 0.68
!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!counter: 54, score: 0.7188888888888888, best_
score: 0.7208496732026144
INFO:__main__:Epoch: 403 | Total Loss: 0.50 | Balanced Accuracy: 0.65
INFO:__main__:Best Balanced Accuracy Seen, validation/test: 0.72 0.68
!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!counter: 55, score: 0.6517647058823529, best_
score: 0.7208496732026144
INFO:__main__:Epoch: 404 | Total Loss: 0.57 | Balanced Accuracy: 0.68
INFO:__main__:Best Balanced Accuracy Seen, validation/test: 0.72 0.68
!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!counter: 56, score: 0.6833986928104575, best_
score: 0.7208496732026144
INFO:__main__:Epoch: 405 | Total Loss: 0.51 | Balanced Accuracy: 0.66
INFO:__main__:Best Balanced Accuracy Seen, validation/test: 0.72 0.68
!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!counter: 57, score: 0.6616339869281046, best_
score: 0.7208496732026144
INFO:__main__:Epoch: 406 | Total Loss: 0.48 | Balanced Accuracy: 0.68
INFO:__main__:Best Balanced Accuracy Seen, validation/test: 0.72 0.68
!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!counter: 58, score: 0.6824836601307189, best_
score: 0.7208496732026144
INFO:__main__:Epoch: 407 | Total Loss: 0.47 | Balanced Accuracy: 0.63
INFO:__main__:Best Balanced Accuracy Seen, validation/test: 0.72 0.68
!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!counter: 59, score: 0.6341176470588236, best_
score: 0.7208496732026144
INFO:__main__:Epoch: 408 | Total Loss: 0.46 | Balanced Accuracy: 0.64
INFO:__main__:Best Balanced Accuracy Seen, validation/test: 0.72 0.68
!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!counter: 60, score: 0.6420261437908498, best_
score: 0.7208496732026144
INFO:__main__:Epoch: 409 | Total Loss: 0.44 | Balanced Accuracy: 0.67
INFO:__main__:Best Balanced Accuracy Seen, validation/test: 0.72 0.68
!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!counter: 61, score: 0.6666666666666666, best_
score: 0.7208496732026144
INFO:__main__:Epoch: 410 | Total Loss: 0.48 | Balanced Accuracy: 0.66
INFO:__main__:Best Balanced Accuracy Seen, validation/test: 0.72 0.68
!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!counter: 62, score: 0.6562745098039215, best_
score: 0.7208496732026144
INFO:__main__:Epoch: 411 | Total Loss: 0.66 | Balanced Accuracy: 0.58
INFO:__main__:Best Balanced Accuracy Seen, validation/test: 0.72 0.68
!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!counter: 63, score: 0.5781699346405228, best_
score: 0.7208496732026144
INFO:__main__:Epoch: 412 | Total Loss: 0.50 | Balanced Accuracy: 0.65
INFO:__main__:Best Balanced Accuracy Seen, validation/test: 0.72 0.68
!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!counter: 64, score: 0.6533333333333333, best_
score: 0.7208496732026144
INFO:__main__:Epoch: 413 | Total Loss: 0.43 | Balanced Accuracy: 0.73
INFO:__main__:Best Balanced Accuracy Seen, validation/test: 0.73 0.75
!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!counter: 0, score: 0.7299346405228758, best_s
core: 0.7299346405228758
INFO:__main__:Epoch: 414 | Total Loss: 0.56 | Balanced Accuracy: 0.63
INFO:__main__:Best Balanced Accuracy Seen, validation/test: 0.73 0.75
!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!counter: 1, score: 0.6326143790849673, best_s
core: 0.7299346405228758
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INFO:__main__:Epoch: 415 | Total Loss: 0.49 | Balanced Accuracy: 0.58
INFO:__main__:Best Balanced Accuracy Seen, validation/test: 0.73 0.75
!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!counter: 2, score: 0.5800653594771242, best_s
core: 0.7299346405228758
INFO:__main__:Epoch: 416 | Total Loss: 0.51 | Balanced Accuracy: 0.67
INFO:__main__:Best Balanced Accuracy Seen, validation/test: 0.73 0.75
!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!counter: 3, score: 0.6692810457516339, best_s
core: 0.7299346405228758
INFO:__main__:Epoch: 417 | Total Loss: 0.51 | Balanced Accuracy: 0.65
INFO:__main__:Best Balanced Accuracy Seen, validation/test: 0.73 0.75
!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!counter: 4, score: 0.6533333333333333, best_s
core: 0.7299346405228758
INFO:__main__:Epoch: 418 | Total Loss: 0.53 | Balanced Accuracy: 0.70
INFO:__main__:Best Balanced Accuracy Seen, validation/test: 0.73 0.75
!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!counter: 5, score: 0.697516339869281, best_sc
ore: 0.7299346405228758
INFO:__main__:Epoch: 419 | Total Loss: 0.46 | Balanced Accuracy: 0.74
INFO:__main__:Best Balanced Accuracy Seen, validation/test: 0.74 0.75
!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!counter: 0, score: 0.7401307189542483, best_s
core: 0.7401307189542483
INFO:__main__:Epoch: 420 | Total Loss: 0.47 | Balanced Accuracy: 0.66
INFO:__main__:Best Balanced Accuracy Seen, validation/test: 0.74 0.75
!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!counter: 1, score: 0.6619607843137255, best_s
core: 0.7401307189542483
INFO:__main__:Epoch: 421 | Total Loss: 0.53 | Balanced Accuracy: 0.65
INFO:__main__:Best Balanced Accuracy Seen, validation/test: 0.74 0.75
!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!counter: 2, score: 0.6483660130718955, best_s
core: 0.7401307189542483
INFO:__main__:Epoch: 422 | Total Loss: 0.45 | Balanced Accuracy: 0.64
INFO:__main__:Best Balanced Accuracy Seen, validation/test: 0.74 0.75
!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!counter: 3, score: 0.64, best_score: 0.740130
7189542483
INFO:__main__:Epoch: 423 | Total Loss: 0.57 | Balanced Accuracy: 0.64
INFO:__main__:Best Balanced Accuracy Seen, validation/test: 0.74 0.75
!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!counter: 4, score: 0.6423529411764707, best_s
core: 0.7401307189542483
INFO:__main__:Epoch: 424 | Total Loss: 0.46 | Balanced Accuracy: 0.65
INFO:__main__:Best Balanced Accuracy Seen, validation/test: 0.74 0.75
!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!counter: 5, score: 0.654640522875817, best_sc
ore: 0.7401307189542483
INFO:__main__:Epoch: 425 | Total Loss: 0.65 | Balanced Accuracy: 0.67
INFO:__main__:Best Balanced Accuracy Seen, validation/test: 0.74 0.75
!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!counter: 6, score: 0.6749019607843136, best_s
core: 0.7401307189542483
INFO:__main__:Epoch: 426 | Total Loss: 0.65 | Balanced Accuracy: 0.64
INFO:__main__:Best Balanced Accuracy Seen, validation/test: 0.74 0.75
!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!counter: 7, score: 0.6448366013071896, best_s
core: 0.7401307189542483
INFO:__main__:Epoch: 427 | Total Loss: 0.53 | Balanced Accuracy: 0.62
INFO:__main__:Best Balanced Accuracy Seen, validation/test: 0.74 0.75
!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!counter: 8, score: 0.6230065359477125, best_s
core: 0.7401307189542483
INFO:__main__:Epoch: 428 | Total Loss: 0.56 | Balanced Accuracy: 0.58
INFO:__main__:Best Balanced Accuracy Seen, validation/test: 0.74 0.75
!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!counter: 9, score: 0.5847058823529413, best_s
core: 0.7401307189542483
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INFO:__main__:Epoch: 429 | Total Loss: 0.53 | Balanced Accuracy: 0.66
INFO:__main__:Best Balanced Accuracy Seen, validation/test: 0.74 0.75
!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!counter: 10, score: 0.6581699346405229, best_
score: 0.7401307189542483
INFO:__main__:Epoch: 430 | Total Loss: 0.49 | Balanced Accuracy: 0.67
INFO:__main__:Best Balanced Accuracy Seen, validation/test: 0.74 0.75
!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!counter: 11, score: 0.6669281045751635, best_
score: 0.7401307189542483
INFO:__main__:Epoch: 431 | Total Loss: 0.51 | Balanced Accuracy: 0.62
INFO:__main__:Best Balanced Accuracy Seen, validation/test: 0.74 0.75
!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!counter: 12, score: 0.6242483660130719, best_
score: 0.7401307189542483
INFO:__main__:Epoch: 432 | Total Loss: 0.54 | Balanced Accuracy: 0.61
INFO:__main__:Best Balanced Accuracy Seen, validation/test: 0.74 0.75
!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!counter: 13, score: 0.6107843137254901, best_
score: 0.7401307189542483
INFO:__main__:Epoch: 433 | Total Loss: 0.50 | Balanced Accuracy: 0.62
INFO:__main__:Best Balanced Accuracy Seen, validation/test: 0.74 0.75
!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!counter: 14, score: 0.6173856209150327, best_
score: 0.7401307189542483
INFO:__main__:Epoch: 434 | Total Loss: 0.57 | Balanced Accuracy: 0.63
INFO:__main__:Best Balanced Accuracy Seen, validation/test: 0.74 0.75
!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!counter: 15, score: 0.6288888888888889, best_
score: 0.7401307189542483
INFO:__main__:Epoch: 435 | Total Loss: 0.46 | Balanced Accuracy: 0.63
INFO:__main__:Best Balanced Accuracy Seen, validation/test: 0.74 0.75
!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!counter: 16, score: 0.6318954248366014, best_
score: 0.7401307189542483
INFO:__main__:Epoch: 436 | Total Loss: 0.48 | Balanced Accuracy: 0.69
INFO:__main__:Best Balanced Accuracy Seen, validation/test: 0.74 0.75
!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!counter: 17, score: 0.6926143790849674, best_
score: 0.7401307189542483
INFO:__main__:Epoch: 437 | Total Loss: 0.51 | Balanced Accuracy: 0.69
INFO:__main__:Best Balanced Accuracy Seen, validation/test: 0.74 0.75
!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!counter: 18, score: 0.6924183006535948, best_
score: 0.7401307189542483
INFO:__main__:Epoch: 438 | Total Loss: 0.50 | Balanced Accuracy: 0.64
INFO:__main__:Best Balanced Accuracy Seen, validation/test: 0.74 0.75
!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!counter: 19, score: 0.6418300653594771, best_
score: 0.7401307189542483
INFO:__main__:Epoch: 439 | Total Loss: 0.63 | Balanced Accuracy: 0.65
INFO:__main__:Best Balanced Accuracy Seen, validation/test: 0.74 0.75
!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!counter: 20, score: 0.6501307189542483, best_
score: 0.7401307189542483
INFO:__main__:Epoch: 440 | Total Loss: 0.58 | Balanced Accuracy: 0.67
INFO:__main__:Best Balanced Accuracy Seen, validation/test: 0.74 0.75
!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!counter: 21, score: 0.6734640522875818, best_
score: 0.7401307189542483
INFO:__main__:Epoch: 441 | Total Loss: 0.63 | Balanced Accuracy: 0.64
INFO:__main__:Best Balanced Accuracy Seen, validation/test: 0.74 0.75
!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!counter: 22, score: 0.6420915032679738, best_
score: 0.7401307189542483
INFO:__main__:Epoch: 442 | Total Loss: 0.53 | Balanced Accuracy: 0.66
INFO:__main__:Best Balanced Accuracy Seen, validation/test: 0.74 0.75
!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!counter: 23, score: 0.656797385620915, best_
score: 0.7401307189542483
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INFO:__main__:Epoch: 443 | Total Loss: 0.47 | Balanced Accuracy: 0.67
INFO:__main__:Best Balanced Accuracy Seen, validation/test: 0.74 0.75
!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!counter: 24, score: 0.6744444444444445, best_
score: 0.7401307189542483
INFO:__main__:Epoch: 444 | Total Loss: 0.59 | Balanced Accuracy: 0.67
INFO:__main__:Best Balanced Accuracy Seen, validation/test: 0.74 0.75
!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!counter: 25, score: 0.6692810457516339, best_
score: 0.7401307189542483
INFO:__main__:Epoch: 445 | Total Loss: 0.69 | Balanced Accuracy: 0.64
INFO:__main__:Best Balanced Accuracy Seen, validation/test: 0.74 0.75
!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!counter: 26, score: 0.6351633986928104, best_
score: 0.7401307189542483
INFO:__main__:Epoch: 446 | Total Loss: 0.56 | Balanced Accuracy: 0.65
INFO:__main__:Best Balanced Accuracy Seen, validation/test: 0.74 0.75
!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!counter: 27, score: 0.6475816993464053, best_
score: 0.7401307189542483
INFO:__main__:Epoch: 447 | Total Loss: 0.53 | Balanced Accuracy: 0.65
INFO:__main__:Best Balanced Accuracy Seen, validation/test: 0.74 0.75
!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!counter: 28, score: 0.6455555555555555, best_
score: 0.7401307189542483
INFO:__main__:Epoch: 448 | Total Loss: 0.56 | Balanced Accuracy: 0.68
INFO:__main__:Best Balanced Accuracy Seen, validation/test: 0.74 0.75
!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!counter: 29, score: 0.6837908496732026, best_
score: 0.7401307189542483
INFO:__main__:Epoch: 449 | Total Loss: 0.57 | Balanced Accuracy: 0.69
INFO:__main__:Best Balanced Accuracy Seen, validation/test: 0.74 0.75
!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!counter: 30, score: 0.6883006535947712, best_
score: 0.7401307189542483
INFO:__main__:Epoch: 450 | Total Loss: 0.60 | Balanced Accuracy: 0.63
INFO:__main__:Best Balanced Accuracy Seen, validation/test: 0.74 0.75
!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!counter: 31, score: 0.6267320261437909, best_
score: 0.7401307189542483
INFO:__main__:Epoch: 451 | Total Loss: 0.53 | Balanced Accuracy: 0.70
INFO:__main__:Best Balanced Accuracy Seen, validation/test: 0.74 0.75
!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!counter: 32, score: 0.6969934640522876, best_
score: 0.7401307189542483
INFO:__main__:Epoch: 452 | Total Loss: 0.61 | Balanced Accuracy: 0.61
INFO:__main__:Best Balanced Accuracy Seen, validation/test: 0.74 0.75
!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!counter: 33, score: 0.6139869281045751, best_
score: 0.7401307189542483
INFO:__main__:Epoch: 453 | Total Loss: 0.54 | Balanced Accuracy: 0.64
INFO:__main__:Best Balanced Accuracy Seen, validation/test: 0.74 0.75
!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!counter: 34, score: 0.6357516339869281, best_
score: 0.7401307189542483
INFO:__main__:Epoch: 454 | Total Loss: 0.57 | Balanced Accuracy: 0.63
INFO:__main__:Best Balanced Accuracy Seen, validation/test: 0.74 0.75
!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!counter: 35, score: 0.6342483660130719, best_
score: 0.7401307189542483
INFO:__main__:Epoch: 455 | Total Loss: 0.73 | Balanced Accuracy: 0.67
INFO:__main__:Best Balanced Accuracy Seen, validation/test: 0.74 0.75
!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!counter: 36, score: 0.6685620915032678, best_
score: 0.7401307189542483
INFO:__main__:Epoch: 456 | Total Loss: 0.57 | Balanced Accuracy: 0.63
INFO:__main__:Best Balanced Accuracy Seen, validation/test: 0.74 0.75
!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!counter: 37, score: 0.6301307189542484, best_
score: 0.7401307189542483
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INFO:__main__:Epoch: 457 | Total Loss: 0.54 | Balanced Accuracy: 0.67
INFO:__main__:Best Balanced Accuracy Seen, validation/test: 0.74 0.75
!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!counter: 38, score: 0.665751633986928, best_score: 0.7401307189542483
INFO:__main__:Epoch: 458 | Total Loss: 0.56 | Balanced Accuracy: 0.65
INFO:__main__:Best Balanced Accuracy Seen, validation/test: 0.74 0.75
!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!counter: 39, score: 0.6536601307189542, best_score: 0.7401307189542483
INFO:__main__:Epoch: 459 | Total Loss: 0.55 | Balanced Accuracy: 0.66
INFO:__main__:Best Balanced Accuracy Seen, validation/test: 0.74 0.75
!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!counter: 40, score: 0.6649673202614379, best_score: 0.7401307189542483
INFO:__main__:Epoch: 460 | Total Loss: 0.49 | Balanced Accuracy: 0.65
INFO:__main__:Best Balanced Accuracy Seen, validation/test: 0.74 0.75
!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!counter: 41, score: 0.6475816993464053, best_score: 0.7401307189542483
INFO:__main__:Epoch: 461 | Total Loss: 0.52 | Balanced Accuracy: 0.65
INFO:__main__:Best Balanced Accuracy Seen, validation/test: 0.74 0.75
!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!counter: 42, score: 0.6518300653594772, best_score: 0.7401307189542483
INFO:__main__:Epoch: 462 | Total Loss: 0.48 | Balanced Accuracy: 0.67
INFO:__main__:Best Balanced Accuracy Seen, validation/test: 0.74 0.75
!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!counter: 43, score: 0.6670588235294117, best_score: 0.7401307189542483
INFO:__main__:Epoch: 463 | Total Loss: 0.51 | Balanced Accuracy: 0.67
INFO:__main__:Best Balanced Accuracy Seen, validation/test: 0.74 0.75
!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!counter: 44, score: 0.6711764705882354, best_score: 0.7401307189542483
INFO:__main__:Epoch: 464 | Total Loss: 0.47 | Balanced Accuracy: 0.68
INFO:__main__:Best Balanced Accuracy Seen, validation/test: 0.74 0.75
!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!counter: 45, score: 0.6845098039215687, best_score: 0.7401307189542483
INFO:__main__:Epoch: 465 | Total Loss: 0.58 | Balanced Accuracy: 0.66
INFO:__main__:Best Balanced Accuracy Seen, validation/test: 0.74 0.75
!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!counter: 46, score: 0.6647712418300654, best_score: 0.7401307189542483
INFO:__main__:Epoch: 466 | Total Loss: 0.56 | Balanced Accuracy: 0.69
INFO:__main__:Best Balanced Accuracy Seen, validation/test: 0.74 0.75
!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!counter: 47, score: 0.6894771241830066, best_score: 0.7401307189542483
INFO:__main__:Epoch: 467 | Total Loss: 0.52 | Balanced Accuracy: 0.67
INFO:__main__:Best Balanced Accuracy Seen, validation/test: 0.74 0.75
!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!counter: 48, score: 0.6736601307189543, best_score: 0.7401307189542483
INFO:__main__:Epoch: 468 | Total Loss: 0.48 | Balanced Accuracy: 0.67
INFO:__main__:Best Balanced Accuracy Seen, validation/test: 0.74 0.75
!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!counter: 49, score: 0.6681045751633987, best_score: 0.7401307189542483
INFO:__main__:Epoch: 469 | Total Loss: 0.57 | Balanced Accuracy: 0.64
INFO:__main__:Best Balanced Accuracy Seen, validation/test: 0.74 0.75
!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!counter: 50, score: 0.6409803921568628, best_score: 0.7401307189542483
INFO:__main__:Epoch: 470 | Total Loss: 0.61 | Balanced Accuracy: 0.65
INFO:__main__:Best Balanced Accuracy Seen, validation/test: 0.74 0.75
!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!counter: 51, score: 0.6525490196078431, best_score: 0.7401307189542483
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INFO:__main__:Epoch: 471 | Total Loss: 0.58 | Balanced Accuracy: 0.60
INFO:__main__:Best Balanced Accuracy Seen, validation/test: 0.74 0.75
!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!counter: 52, score: 0.5982352941176471, best_
score: 0.7401307189542483
INFO:__main__:Epoch: 472 | Total Loss: 0.54 | Balanced Accuracy: 0.62
INFO:__main__:Best Balanced Accuracy Seen, validation/test: 0.74 0.75
!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!counter: 53, score: 0.618562091503268, best_s
core: 0.7401307189542483
INFO:__main__:Epoch: 473 | Total Loss: 0.63 | Balanced Accuracy: 0.64
INFO:__main__:Best Balanced Accuracy Seen, validation/test: 0.74 0.75
!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!counter: 54, score: 0.6440522875816993, best_
score: 0.7401307189542483
INFO:__main__:Epoch: 474 | Total Loss: 0.52 | Balanced Accuracy: 0.67
INFO:__main__:Best Balanced Accuracy Seen, validation/test: 0.74 0.75
!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!counter: 55, score: 0.6656862745098039, best_
score: 0.7401307189542483
INFO:__main__:Epoch: 475 | Total Loss: 0.51 | Balanced Accuracy: 0.66
INFO:__main__:Best Balanced Accuracy Seen, validation/test: 0.74 0.75
!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!counter: 56, score: 0.6561437908496731, best_
score: 0.7401307189542483
INFO:__main__:Epoch: 476 | Total Loss: 0.49 | Balanced Accuracy: 0.64
INFO:__main__:Best Balanced Accuracy Seen, validation/test: 0.74 0.75
!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!counter: 57, score: 0.6356209150326797, best_
score: 0.7401307189542483
INFO:__main__:Epoch: 477 | Total Loss: 0.50 | Balanced Accuracy: 0.65
INFO:__main__:Best Balanced Accuracy Seen, validation/test: 0.74 0.75
!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!counter: 58, score: 0.6492810457516339, best_
score: 0.7401307189542483
INFO:__main__:Epoch: 478 | Total Loss: 0.49 | Balanced Accuracy: 0.64
INFO:__main__:Best Balanced Accuracy Seen, validation/test: 0.74 0.75
!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!counter: 59, score: 0.6381045751633988, best_
score: 0.7401307189542483
INFO:__main__:Epoch: 479 | Total Loss: 0.55 | Balanced Accuracy: 0.67
INFO:__main__:Best Balanced Accuracy Seen, validation/test: 0.74 0.75
!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!counter: 60, score: 0.6671895424836601, best_
score: 0.7401307189542483
INFO:__main__:Epoch: 480 | Total Loss: 0.52 | Balanced Accuracy: 0.67
INFO:__main__:Best Balanced Accuracy Seen, validation/test: 0.74 0.75
!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!counter: 61, score: 0.6698039215686276, best_
score: 0.7401307189542483
INFO:__main__:Epoch: 481 | Total Loss: 0.55 | Balanced Accuracy: 0.62
INFO:__main__:Best Balanced Accuracy Seen, validation/test: 0.74 0.75
!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!counter: 62, score: 0.6184967320261437, best_
score: 0.7401307189542483
INFO:__main__:Epoch: 482 | Total Loss: 0.54 | Balanced Accuracy: 0.70
INFO:__main__:Best Balanced Accuracy Seen, validation/test: 0.74 0.75
!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!counter: 63, score: 0.6979738562091503, best_
score: 0.7401307189542483
INFO:__main__:Epoch: 483 | Total Loss: 0.55 | Balanced Accuracy: 0.65
INFO:__main__:Best Balanced Accuracy Seen, validation/test: 0.74 0.75
!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!counter: 64, score: 0.6524183006535947, best_
score: 0.7401307189542483
INFO:__main__:Epoch: 484 | Total Loss: 0.53 | Balanced Accuracy: 0.65
INFO:__main__:Best Balanced Accuracy Seen, validation/test: 0.74 0.75
!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!counter: 65, score: 0.6498692810457517, best_
score: 0.7401307189542483
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INFO:__main__:Epoch: 485 | Total Loss: 0.57 | Balanced Accuracy: 0.56
INFO:__main__:Best Balanced Accuracy Seen, validation/test: 0.74 0.75
!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!counter: 66, score: 0.560718954248366, best_s
core: 0.7401307189542483
INFO:__main__:Epoch: 486 | Total Loss: 0.57 | Balanced Accuracy: 0.60
INFO:__main__:Best Balanced Accuracy Seen, validation/test: 0.74 0.75
!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!counter: 67, score: 0.6, best_score: 0.740130
7189542483
INFO:__main__:Epoch: 487 | Total Loss: 0.54 | Balanced Accuracy: 0.65
INFO:__main__:Best Balanced Accuracy Seen, validation/test: 0.74 0.75
!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!counter: 68, score: 0.6469281045751635, best_
score: 0.7401307189542483
INFO:__main__:Epoch: 488 | Total Loss: 0.53 | Balanced Accuracy: 0.62
INFO:__main__:Best Balanced Accuracy Seen, validation/test: 0.74 0.75
!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!counter: 69, score: 0.6215032679738561, best_
score: 0.7401307189542483
INFO:__main__:Epoch: 489 | Total Loss: 0.54 | Balanced Accuracy: 0.56
INFO:__main__:Best Balanced Accuracy Seen, validation/test: 0.74 0.75
!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!counter: 70, score: 0.5576470588235295, best_
score: 0.7401307189542483
INFO:__main__:Epoch: 490 | Total Loss: 0.54 | Balanced Accuracy: 0.66
INFO:__main__:Best Balanced Accuracy Seen, validation/test: 0.74 0.75
!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!counter: 71, score: 0.662222222222223, best_
score: 0.7401307189542483
INFO:__main__:Epoch: 491 | Total Loss: 0.54 | Balanced Accuracy: 0.63
INFO:__main__:Best Balanced Accuracy Seen, validation/test: 0.74 0.75
!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!counter: 72, score: 0.6329411764705882, best_
score: 0.7401307189542483
INFO:__main__:Epoch: 492 | Total Loss: 0.52 | Balanced Accuracy: 0.62
INFO:__main__:Best Balanced Accuracy Seen, validation/test: 0.74 0.75
!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!counter: 73, score: 0.6196078431372548, best_
score: 0.7401307189542483
INFO:__main__:Epoch: 493 | Total Loss: 0.48 | Balanced Accuracy: 0.63
INFO:__main__:Best Balanced Accuracy Seen, validation/test: 0.74 0.75
!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!counter: 74, score: 0.6257516339869281, best_
score: 0.7401307189542483
INFO:__main__:Epoch: 494 | Total Loss: 0.56 | Balanced Accuracy: 0.63
INFO:__main__:Best Balanced Accuracy Seen, validation/test: 0.74 0.75
!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!counter: 75, score: 0.6284313725490196, best_
score: 0.7401307189542483
INFO:__main__:Epoch: 495 | Total Loss: 0.54 | Balanced Accuracy: 0.58
INFO:__main__:Best Balanced Accuracy Seen, validation/test: 0.74 0.75
!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!counter: 76, score: 0.5781045751633987, best_
score: 0.7401307189542483
INFO:__main__:Epoch: 496 | Total Loss: 0.57 | Balanced Accuracy: 0.67
INFO:__main__:Best Balanced Accuracy Seen, validation/test: 0.74 0.75
!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!counter: 77, score: 0.6670588235294117, best_
score: 0.7401307189542483
INFO:__main__:Epoch: 497 | Total Loss: 0.50 | Balanced Accuracy: 0.62
INFO:__main__:Best Balanced Accuracy Seen, validation/test: 0.74 0.75
!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!counter: 78, score: 0.6169281045751633, best_
score: 0.7401307189542483
INFO:__main__:Epoch: 498 | Total Loss: 0.53 | Balanced Accuracy: 0.58
INFO:__main__:Best Balanced Accuracy Seen, validation/test: 0.74 0.75
!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!counter: 79, score: 0.5786928104575164, best_
score: 0.7401307189542483
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INFO:__main__:Epoch: 499 | Total Loss: 0.50 | Balanced Accuracy: 0.63
INFO:__main__:Best Balanced Accuracy Seen, validation/test: 0.74 0.75
!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!counter: 80, score: 0.6261437908496732, best_
score: 0.7401307189542483
INFO:__main__:Epoch: 500 | Total Loss: 0.63 | Balanced Accuracy: 0.57
INFO:__main__:Best Balanced Accuracy Seen, validation/test: 0.74 0.75
!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!counter: 81, score: 0.5744444444444444, best_
score: 0.7401307189542483
INFO:__main__:Epoch: 501 | Total Loss: 0.55 | Balanced Accuracy: 0.61
INFO:__main__:Best Balanced Accuracy Seen, validation/test: 0.74 0.75
!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!counter: 82, score: 0.6122875816993464, best_
score: 0.7401307189542483
INFO:__main__:Epoch: 502 | Total Loss: 0.52 | Balanced Accuracy: 0.66
INFO:__main__:Best Balanced Accuracy Seen, validation/test: 0.74 0.75
!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!counter: 83, score: 0.6628104575163399, best_
score: 0.7401307189542483
INFO:__main__:Epoch: 503 | Total Loss: 0.48 | Balanced Accuracy: 0.60
INFO:__main__:Best Balanced Accuracy Seen, validation/test: 0.74 0.75
!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!counter: 84, score: 0.6013071895424836, best_
score: 0.7401307189542483
INFO:__main__:Epoch: 504 | Total Loss: 0.49 | Balanced Accuracy: 0.69
INFO:__main__:Best Balanced Accuracy Seen, validation/test: 0.74 0.75
!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!counter: 85, score: 0.6933333333333334, best_
score: 0.7401307189542483
INFO:__main__:Epoch: 505 | Total Loss: 0.53 | Balanced Accuracy: 0.58
INFO:__main__:Best Balanced Accuracy Seen, validation/test: 0.74 0.75
!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!counter: 86, score: 0.5779738562091503, best_
score: 0.7401307189542483
INFO:__main__:Epoch: 506 | Total Loss: 0.70 | Balanced Accuracy: 0.48
INFO:__main__:Best Balanced Accuracy Seen, validation/test: 0.74 0.75
!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!counter: 87, score: 0.48424836601307186, best
_score: 0.7401307189542483
INFO:__main__:Epoch: 507 | Total Loss: 0.88 | Balanced Accuracy: 0.57
INFO:__main__:Best Balanced Accuracy Seen, validation/test: 0.74 0.75
!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!counter: 88, score: 0.5676470588235294, best_
score: 0.7401307189542483
INFO:__main__:Epoch: 508 | Total Loss: 0.56 | Balanced Accuracy: 0.59
INFO:__main__:Best Balanced Accuracy Seen, validation/test: 0.74 0.75
!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!counter: 89, score: 0.5928104575163399, best_
score: 0.7401307189542483
INFO:__main__:Epoch: 509 | Total Loss: 0.64 | Balanced Accuracy: 0.64
INFO:__main__:Best Balanced Accuracy Seen, validation/test: 0.74 0.75
!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!counter: 90, score: 0.6404575163398692, best_
score: 0.7401307189542483
INFO:__main__:Epoch: 510 | Total Loss: 0.61 | Balanced Accuracy: 0.67
INFO:__main__:Best Balanced Accuracy Seen, validation/test: 0.74 0.75
!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!counter: 91, score: 0.6743137254901961, best_
score: 0.7401307189542483
INFO:__main__:Epoch: 511 | Total Loss: 0.65 | Balanced Accuracy: 0.66
INFO:__main__:Best Balanced Accuracy Seen, validation/test: 0.74 0.75
!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!counter: 92, score: 0.6635947712418301, best_
score: 0.7401307189542483
INFO:__main__:Epoch: 512 | Total Loss: 0.50 | Balanced Accuracy: 0.66
INFO:__main__:Best Balanced Accuracy Seen, validation/test: 0.74 0.75
!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!counter: 93, score: 0.6613071895424837, best_
score: 0.7401307189542483
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INFO:__main__:Epoch: 513 | Total Loss: 0.57 | Balanced Accuracy: 0.57
INFO:__main__:Best Balanced Accuracy Seen, validation/test: 0.74 0.75
!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!counter: 94, score: 0.5664052287581699, best_
score: 0.7401307189542483
INFO:__main__:Epoch: 514 | Total Loss: 0.50 | Balanced Accuracy: 0.60
INFO:__main__:Best Balanced Accuracy Seen, validation/test: 0.74 0.75
!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!counter: 95, score: 0.6022222222222222, best_
score: 0.7401307189542483
INFO:__main__:Epoch: 515 | Total Loss: 0.52 | Balanced Accuracy: 0.62
INFO:__main__:Best Balanced Accuracy Seen, validation/test: 0.74 0.75
!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!counter: 96, score: 0.6158169934640524, best_
score: 0.7401307189542483
INFO:__main__:Epoch: 516 | Total Loss: 0.50 | Balanced Accuracy: 0.60
INFO:__main__:Best Balanced Accuracy Seen, validation/test: 0.74 0.75
!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!counter: 97, score: 0.5983660130718954, best_
score: 0.7401307189542483
INFO:__main__:Epoch: 517 | Total Loss: 0.53 | Balanced Accuracy: 0.61
INFO:__main__:Best Balanced Accuracy Seen, validation/test: 0.74 0.75
!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!counter: 98, score: 0.6126143790849673, best_
score: 0.7401307189542483
INFO:__main__:Epoch: 518 | Total Loss: 0.67 | Balanced Accuracy: 0.54
INFO:__main__:Best Balanced Accuracy Seen, validation/test: 0.74 0.75
!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!counter: 99, score: 0.5428758169934641, best_
score: 0.7401307189542483
INFO:__main__:Epoch: 519 | Total Loss: 0.60 | Balanced Accuracy: 0.59
INFO:__main__:Best Balanced Accuracy Seen, validation/test: 0.74 0.75
!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!counter: 100, score: 0.5901960784313726, best
_score: 0.7401307189542483
INFO:__main__:Epoch: 520 | Total Loss: 0.54 | Balanced Accuracy: 0.60
INFO:__main__:Best Balanced Accuracy Seen, validation/test: 0.74 0.75
!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!counter: 101, score: 0.6013071895424836, best
_score: 0.7401307189542483
INFO:__main__:Epoch: 521 | Total Loss: 0.57 | Balanced Accuracy: 0.59
INFO:__main__:Best Balanced Accuracy Seen, validation/test: 0.74 0.75
!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!counter: 102, score: 0.5937254901960783, best
_score: 0.7401307189542483
INFO:__main__:Epoch: 522 | Total Loss: 0.50 | Balanced Accuracy: 0.56
INFO:__main__:Best Balanced Accuracy Seen, validation/test: 0.74 0.75
!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!counter: 103, score: 0.5611764705882353, best
_score: 0.7401307189542483
INFO:__main__:Epoch: 523 | Total Loss: 0.51 | Balanced Accuracy: 0.59
INFO:__main__:Best Balanced Accuracy Seen, validation/test: 0.74 0.75
!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!counter: 104, score: 0.5857516339869281, best
_score: 0.7401307189542483
INFO:__main__:Epoch: 524 | Total Loss: 0.55 | Balanced Accuracy: 0.59
INFO:__main__:Best Balanced Accuracy Seen, validation/test: 0.74 0.75
!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!counter: 105, score: 0.588562091503268, best_
score: 0.7401307189542483
INFO:__main__:Epoch: 525 | Total Loss: 0.54 | Balanced Accuracy: 0.57
INFO:__main__:Best Balanced Accuracy Seen, validation/test: 0.74 0.75
!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!counter: 106, score: 0.5724836601307189, best
_score: 0.7401307189542483
INFO:__main__:Epoch: 526 | Total Loss: 0.61 | Balanced Accuracy: 0.53
INFO:__main__:Best Balanced Accuracy Seen, validation/test: 0.74 0.75
!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!counter: 107, score: 0.5260130718954249, best
_score: 0.7401307189542483
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INFO:__main__:Epoch: 527 | Total Loss: 0.52 | Balanced Accuracy: 0.56
INFO:__main__:Best Balanced Accuracy Seen, validation/test: 0.74 0.75
!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!counter: 108, score: 0.5571895424836601, best
_score: 0.7401307189542483
INFO:__main__:Epoch: 528 | Total Loss: 0.56 | Balanced Accuracy: 0.61
INFO:__main__:Best Balanced Accuracy Seen, validation/test: 0.74 0.75
!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!counter: 109, score: 0.6057516339869281, best
_score: 0.7401307189542483
INFO:__main__:Epoch: 529 | Total Loss: 0.49 | Balanced Accuracy: 0.59
INFO:__main__:Best Balanced Accuracy Seen, validation/test: 0.74 0.75
!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!counter: 110, score: 0.587843137254902, best
_score: 0.7401307189542483
INFO:__main__:Epoch: 530 | Total Loss: 0.59 | Balanced Accuracy: 0.59
INFO:__main__:Best Balanced Accuracy Seen, validation/test: 0.74 0.75
!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!counter: 111, score: 0.5852287581699347, best
_score: 0.7401307189542483
INFO:__main__:Epoch: 531 | Total Loss: 0.50 | Balanced Accuracy: 0.59
INFO:__main__:Best Balanced Accuracy Seen, validation/test: 0.74 0.75
!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!counter: 112, score: 0.5856209150326798, best
_score: 0.7401307189542483
INFO:__main__:Epoch: 532 | Total Loss: 0.66 | Balanced Accuracy: 0.63
INFO:__main__:Best Balanced Accuracy Seen, validation/test: 0.74 0.75
!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!counter: 113, score: 0.6254248366013072, best
_score: 0.7401307189542483
INFO:__main__:Epoch: 533 | Total Loss: 0.57 | Balanced Accuracy: 0.63
INFO:__main__:Best Balanced Accuracy Seen, validation/test: 0.74 0.75
!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!counter: 114, score: 0.6271241830065359, best
_score: 0.7401307189542483
INFO:__main__:Epoch: 534 | Total Loss: 0.54 | Balanced Accuracy: 0.64
INFO:__main__:Best Balanced Accuracy Seen, validation/test: 0.74 0.75
!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!counter: 115, score: 0.6401960784313725, best
_score: 0.7401307189542483
INFO:__main__:Epoch: 535 | Total Loss: 0.57 | Balanced Accuracy: 0.62
INFO:__main__:Best Balanced Accuracy Seen, validation/test: 0.74 0.75
!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!counter: 116, score: 0.6194771241830065, best
_score: 0.7401307189542483
INFO:__main__:Epoch: 536 | Total Loss: 0.51 | Balanced Accuracy: 0.65
INFO:__main__:Best Balanced Accuracy Seen, validation/test: 0.74 0.75
!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!counter: 117, score: 0.6503921568627451, best
_score: 0.7401307189542483
INFO:__main__:Epoch: 537 | Total Loss: 0.50 | Balanced Accuracy: 0.61
INFO:__main__:Best Balanced Accuracy Seen, validation/test: 0.74 0.75
!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!counter: 118, score: 0.6090849673202614, best
_score: 0.7401307189542483
INFO:__main__:Epoch: 538 | Total Loss: 0.52 | Balanced Accuracy: 0.63
INFO:__main__:Best Balanced Accuracy Seen, validation/test: 0.74 0.75
!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!counter: 119, score: 0.6268627450980392, best
_score: 0.7401307189542483
INFO:__main__:Epoch: 539 | Total Loss: 0.58 | Balanced Accuracy: 0.66
INFO:__main__:Best Balanced Accuracy Seen, validation/test: 0.74 0.75
!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!counter: 120, score: 0.662222222222223, best
_score: 0.7401307189542483
INFO:__main__:Epoch: 540 | Total Loss: 0.65 | Balanced Accuracy: 0.63
INFO:__main__:Best Balanced Accuracy Seen, validation/test: 0.74 0.75
!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!counter: 121, score: 0.6259477124183007, best
_score: 0.7401307189542483
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INFO:__main__:Epoch: 541 | Total Loss: 0.66 | Balanced Accuracy: 0.64
INFO:__main__:Best Balanced Accuracy Seen, validation/test: 0.74 0.75
!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!counter: 122, score: 0.637450980392157, best_
score: 0.7401307189542483
INFO:__main__:Epoch: 542 | Total Loss: 0.72 | Balanced Accuracy: 0.60
INFO:__main__:Best Balanced Accuracy Seen, validation/test: 0.74 0.75
!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!counter: 123, score: 0.6047058823529412, best
_score: 0.7401307189542483
INFO:__main__:Epoch: 543 | Total Loss: 0.73 | Balanced Accuracy: 0.66
INFO:__main__:Best Balanced Accuracy Seen, validation/test: 0.74 0.75
!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!counter: 124, score: 0.6596078431372548, best
_score: 0.7401307189542483
INFO:__main__:Epoch: 544 | Total Loss: 0.58 | Balanced Accuracy: 0.48
INFO:__main__:Best Balanced Accuracy Seen, validation/test: 0.74 0.75
!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!counter: 125, score: 0.4837908496732026, best
_score: 0.7401307189542483
INFO:__main__:Epoch: 545 | Total Loss: 0.56 | Balanced Accuracy: 0.59
INFO:__main__:Best Balanced Accuracy Seen, validation/test: 0.74 0.75
!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!counter: 126, score: 0.5930065359477125, best
_score: 0.7401307189542483
INFO:__main__:Epoch: 546 | Total Loss: 0.64 | Balanced Accuracy: 0.62
INFO:__main__:Best Balanced Accuracy Seen, validation/test: 0.74 0.75
!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!counter: 127, score: 0.6220915032679738, best
_score: 0.7401307189542483
INFO:__main__:Epoch: 547 | Total Loss: 0.59 | Balanced Accuracy: 0.59
INFO:__main__:Best Balanced Accuracy Seen, validation/test: 0.74 0.75
!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!counter: 128, score: 0.586078431372549, best_
score: 0.7401307189542483
INFO:__main__:Epoch: 548 | Total Loss: 0.52 | Balanced Accuracy: 0.63
INFO:__main__:Best Balanced Accuracy Seen, validation/test: 0.74 0.75
!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!counter: 129, score: 0.628562091503268, best_
score: 0.7401307189542483
INFO:__main__:Epoch: 549 | Total Loss: 0.48 | Balanced Accuracy: 0.63
INFO:__main__:Best Balanced Accuracy Seen, validation/test: 0.74 0.75
!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!counter: 130, score: 0.6259477124183007, best
_score: 0.7401307189542483
INFO:__main__:Epoch: 550 | Total Loss: 0.51 | Balanced Accuracy: 0.64
INFO:__main__:Best Balanced Accuracy Seen, validation/test: 0.74 0.75
!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!counter: 131, score: 0.6418954248366013, best
_score: 0.7401307189542483
INFO:__main__:Epoch: 551 | Total Loss: 0.60 | Balanced Accuracy: 0.64
INFO:__main__:Best Balanced Accuracy Seen, validation/test: 0.74 0.75
!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!counter: 132, score: 0.6397385620915034, best
_score: 0.7401307189542483
INFO:__main__:Epoch: 552 | Total Loss: 0.63 | Balanced Accuracy: 0.62
INFO:__main__:Best Balanced Accuracy Seen, validation/test: 0.74 0.75
!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!counter: 133, score: 0.62359477124183, best_s
core: 0.7401307189542483
INFO:__main__:Epoch: 553 | Total Loss: 0.55 | Balanced Accuracy: 0.63
INFO:__main__:Best Balanced Accuracy Seen, validation/test: 0.74 0.75
!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!counter: 134, score: 0.632222222222224, best
_score: 0.7401307189542483
INFO:__main__:Epoch: 554 | Total Loss: 0.58 | Balanced Accuracy: 0.62
INFO:__main__:Best Balanced Accuracy Seen, validation/test: 0.74 0.75
!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!counter: 135, score: 0.6201960784313726, best
_score: 0.7401307189542483
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INFO:__main__:Epoch: 555 | Total Loss: 0.53 | Balanced Accuracy: 0.60
INFO:__main__:Best Balanced Accuracy Seen, validation/test: 0.74 0.75
!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!counter: 136, score: 0.6013071895424836, best
_score: 0.7401307189542483
INFO:__main__:Epoch: 556 | Total Loss: 0.63 | Balanced Accuracy: 0.64
INFO:__main__:Best Balanced Accuracy Seen, validation/test: 0.74 0.75
!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!counter: 137, score: 0.643202614379085, best_
score: 0.7401307189542483
INFO:__main__:Epoch: 557 | Total Loss: 0.54 | Balanced Accuracy: 0.66
INFO:__main__:Best Balanced Accuracy Seen, validation/test: 0.74 0.75
!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!counter: 138, score: 0.6619607843137255, best
_score: 0.7401307189542483
INFO:__main__:Epoch: 558 | Total Loss: 0.53 | Balanced Accuracy: 0.64
INFO:__main__:Best Balanced Accuracy Seen, validation/test: 0.74 0.75
!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!counter: 139, score: 0.6426143790849673, best
_score: 0.7401307189542483
INFO:__main__:Epoch: 559 | Total Loss: 0.59 | Balanced Accuracy: 0.65
INFO:__main__:Best Balanced Accuracy Seen, validation/test: 0.74 0.75
!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!counter: 140, score: 0.647843137254902, best_
score: 0.7401307189542483
INFO:__main__:Epoch: 560 | Total Loss: 0.49 | Balanced Accuracy: 0.63
INFO:__main__:Best Balanced Accuracy Seen, validation/test: 0.74 0.75
!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!counter: 141, score: 0.6274509803921569, best
_score: 0.7401307189542483
INFO:__main__:Epoch: 561 | Total Loss: 0.64 | Balanced Accuracy: 0.66
INFO:__main__:Best Balanced Accuracy Seen, validation/test: 0.74 0.75
!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!counter: 142, score: 0.6565359477124183, best
_score: 0.7401307189542483
INFO:__main__:Epoch: 562 | Total Loss: 0.60 | Balanced Accuracy: 0.66
INFO:__main__:Best Balanced Accuracy Seen, validation/test: 0.74 0.75
!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!counter: 143, score: 0.6603921568627451, best
_score: 0.7401307189542483
INFO:__main__:Epoch: 563 | Total Loss: 0.76 | Balanced Accuracy: 0.56
INFO:__main__:Best Balanced Accuracy Seen, validation/test: 0.74 0.75
!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!counter: 144, score: 0.5554248366013073, best
_score: 0.7401307189542483
INFO:__main__:Epoch: 564 | Total Loss: 0.77 | Balanced Accuracy: 0.52
INFO:__main__:Best Balanced Accuracy Seen, validation/test: 0.74 0.75
!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!counter: 145, score: 0.521764705882353, best_
score: 0.7401307189542483
INFO:__main__:Epoch: 565 | Total Loss: 0.60 | Balanced Accuracy: 0.61
INFO:__main__:Best Balanced Accuracy Seen, validation/test: 0.74 0.75
!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!counter: 146, score: 0.6137908496732026, best
_score: 0.7401307189542483
INFO:__main__:Epoch: 566 | Total Loss: 0.61 | Balanced Accuracy: 0.57
INFO:__main__:Best Balanced Accuracy Seen, validation/test: 0.74 0.75
!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!counter: 147, score: 0.5662745098039216, best
_score: 0.7401307189542483
INFO:__main__:Epoch: 567 | Total Loss: 0.59 | Balanced Accuracy: 0.61
INFO:__main__:Best Balanced Accuracy Seen, validation/test: 0.74 0.75
!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!counter: 148, score: 0.6056209150326798, best
_score: 0.7401307189542483
INFO:__main__:Epoch: 568 | Total Loss: 0.55 | Balanced Accuracy: 0.62
INFO:__main__:Best Balanced Accuracy Seen, validation/test: 0.74 0.75
!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!counter: 149, score: 0.6224836601307189, best
_score: 0.7401307189542483
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INFO:__main__:Epoch: 569 | Total Loss: 0.54 | Balanced Accuracy: 0.49
INFO:__main__:Best Balanced Accuracy Seen, validation/test: 0.74 0.75
!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!counter: 150, score: 0.4879738562091503, best
_score: 0.7401307189542483
INFO:__main__:Epoch: 570 | Total Loss: 0.62 | Balanced Accuracy: 0.53
INFO:__main__:Best Balanced Accuracy Seen, validation/test: 0.74 0.75
!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!counter: 151, score: 0.5295424836601308, best
_score: 0.7401307189542483
INFO:__main__:Epoch: 571 | Total Loss: 0.58 | Balanced Accuracy: 0.58
INFO:__main__:Best Balanced Accuracy Seen, validation/test: 0.74 0.75
!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!counter: 152, score: 0.5839215686274509, best
_score: 0.7401307189542483
INFO:__main__:Epoch: 572 | Total Loss: 0.60 | Balanced Accuracy: 0.52
INFO:__main__:Best Balanced Accuracy Seen, validation/test: 0.74 0.75
!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!counter: 153, score: 0.5157516339869281, best
_score: 0.7401307189542483
INFO:__main__:Epoch: 573 | Total Loss: 0.73 | Balanced Accuracy: 0.61
INFO:__main__:Best Balanced Accuracy Seen, validation/test: 0.74 0.75
!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!counter: 154, score: 0.613921568627451, best_
score: 0.7401307189542483
INFO:__main__:Epoch: 574 | Total Loss: 0.72 | Balanced Accuracy: 0.60
INFO:__main__:Best Balanced Accuracy Seen, validation/test: 0.74 0.75
!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!counter: 155, score: 0.6048366013071895, best
_score: 0.7401307189542483
INFO:__main__:Epoch: 575 | Total Loss: 0.54 | Balanced Accuracy: 0.60
INFO:__main__:Best Balanced Accuracy Seen, validation/test: 0.74 0.75
!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!counter: 156, score: 0.5991503267973856, best
_score: 0.7401307189542483
INFO:__main__:Epoch: 576 | Total Loss: 0.51 | Balanced Accuracy: 0.55
INFO:__main__:Best Balanced Accuracy Seen, validation/test: 0.74 0.75
!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!counter: 157, score: 0.5548366013071896, best
_score: 0.7401307189542483
INFO:__main__:Epoch: 577 | Total Loss: 0.57 | Balanced Accuracy: 0.56
INFO:__main__:Best Balanced Accuracy Seen, validation/test: 0.74 0.75
!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!counter: 158, score: 0.5601960784313725, best
_score: 0.7401307189542483
INFO:__main__:Epoch: 578 | Total Loss: 0.67 | Balanced Accuracy: 0.56
INFO:__main__:Best Balanced Accuracy Seen, validation/test: 0.74 0.75
!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!counter: 159, score: 0.5630718954248366, best
_score: 0.7401307189542483
INFO:__main__:Epoch: 579 | Total Loss: 0.64 | Balanced Accuracy: 0.62
INFO:__main__:Best Balanced Accuracy Seen, validation/test: 0.74 0.75
!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!counter: 160, score: 0.6241176470588234, best
_score: 0.7401307189542483
INFO:__main__:Epoch: 580 | Total Loss: 0.59 | Balanced Accuracy: 0.61
INFO:__main__:Best Balanced Accuracy Seen, validation/test: 0.74 0.75
!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!counter: 161, score: 0.6063398692810457, best
_score: 0.7401307189542483
INFO:__main__:Epoch: 581 | Total Loss: 0.54 | Balanced Accuracy: 0.63
INFO:__main__:Best Balanced Accuracy Seen, validation/test: 0.74 0.75
!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!counter: 162, score: 0.6254248366013072, best
_score: 0.7401307189542483
INFO:__main__:Epoch: 582 | Total Loss: 0.52 | Balanced Accuracy: 0.63
INFO:__main__:Best Balanced Accuracy Seen, validation/test: 0.74 0.75
!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!counter: 163, score: 0.6267320261437909, best
_score: 0.7401307189542483
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INFO:__main__:Epoch: 583 | Total Loss: 0.72 | Balanced Accuracy: 0.55
INFO:__main__:Best Balanced Accuracy Seen, validation/test: 0.74 0.75
!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!counter: 164, score: 0.5454901960784314, best
_score: 0.7401307189542483
INFO:__main__:Epoch: 584 | Total Loss: 0.63 | Balanced Accuracy: 0.57
INFO:__main__:Best Balanced Accuracy Seen, validation/test: 0.74 0.75
!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!counter: 165, score: 0.5654248366013072, best
_score: 0.7401307189542483
INFO:__main__:Epoch: 585 | Total Loss: 0.64 | Balanced Accuracy: 0.53
INFO:__main__:Best Balanced Accuracy Seen, validation/test: 0.74 0.75
!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!counter: 166, score: 0.5335947712418301, best
_score: 0.7401307189542483
INFO:__main__:Epoch: 586 | Total Loss: 0.72 | Balanced Accuracy: 0.56
INFO:__main__:Best Balanced Accuracy Seen, validation/test: 0.74 0.75
!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!counter: 167, score: 0.5607843137254902, best
_score: 0.7401307189542483
INFO:__main__:Epoch: 587 | Total Loss: 0.66 | Balanced Accuracy: 0.58
INFO:__main__:Best Balanced Accuracy Seen, validation/test: 0.74 0.75
!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!counter: 168, score: 0.5774509803921569, best
_score: 0.7401307189542483
INFO:__main__:Epoch: 588 | Total Loss: 0.63 | Balanced Accuracy: 0.58
INFO:__main__:Best Balanced Accuracy Seen, validation/test: 0.74 0.75
!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!counter: 169, score: 0.575359477124183, best_
score: 0.7401307189542483
INFO:__main__:Epoch: 589 | Total Loss: 0.57 | Balanced Accuracy: 0.63
INFO:__main__:Best Balanced Accuracy Seen, validation/test: 0.74 0.75
!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!counter: 170, score: 0.6328104575163399, best
_score: 0.7401307189542483
INFO:__main__:Epoch: 590 | Total Loss: 0.70 | Balanced Accuracy: 0.58
INFO:__main__:Best Balanced Accuracy Seen, validation/test: 0.74 0.75
!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!counter: 171, score: 0.5801960784313726, best
_score: 0.7401307189542483
INFO:__main__:Epoch: 591 | Total Loss: 0.60 | Balanced Accuracy: 0.60
INFO:__main__:Best Balanced Accuracy Seen, validation/test: 0.74 0.75
!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!counter: 172, score: 0.60111111111111, best_
score: 0.7401307189542483
INFO:__main__:Epoch: 592 | Total Loss: 0.63 | Balanced Accuracy: 0.55
INFO:__main__:Best Balanced Accuracy Seen, validation/test: 0.74 0.75
!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!counter: 173, score: 0.5507843137254902, best
_score: 0.7401307189542483
INFO:__main__:Epoch: 593 | Total Loss: 0.56 | Balanced Accuracy: 0.62
INFO:__main__:Best Balanced Accuracy Seen, validation/test: 0.74 0.75
!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!counter: 174, score: 0.6237254901960784, best
_score: 0.7401307189542483
INFO:__main__:Epoch: 594 | Total Loss: 0.52 | Balanced Accuracy: 0.59
INFO:__main__:Best Balanced Accuracy Seen, validation/test: 0.74 0.75
!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!counter: 175, score: 0.5862745098039216, best
_score: 0.7401307189542483
INFO:__main__:Epoch: 595 | Total Loss: 0.72 | Balanced Accuracy: 0.62
INFO:__main__:Best Balanced Accuracy Seen, validation/test: 0.74 0.75
!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!counter: 176, score: 0.6249019607843137, best
_score: 0.7401307189542483
INFO:__main__:Epoch: 596 | Total Loss: 0.55 | Balanced Accuracy: 0.65
INFO:__main__:Best Balanced Accuracy Seen, validation/test: 0.74 0.75
!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!counter: 177, score: 0.6481699346405229, best
_score: 0.7401307189542483
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INFO:__main__:Epoch: 597 | Total Loss: 0.59 | Balanced Accuracy: 0.66
INFO:__main__:Best Balanced Accuracy Seen, validation/test: 0.74 0.75
!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!counter: 178, score: 0.6586928104575164, best
_score: 0.7401307189542483
INFO:__main__:Epoch: 598 | Total Loss: 0.83 | Balanced Accuracy: 0.62
INFO:__main__:Best Balanced Accuracy Seen, validation/test: 0.74 0.75
!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!counter: 179, score: 0.6212418300653595, best
_score: 0.7401307189542483
INFO:__main__:Epoch: 599 | Total Loss: 0.65 | Balanced Accuracy: 0.70
INFO:__main__:Best Balanced Accuracy Seen, validation/test: 0.74 0.75
!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!counter: 180, score: 0.7022222222222222, best
_score: 0.7401307189542483
INFO:__main__:Epoch: 600 | Total Loss: 0.59 | Balanced Accuracy: 0.60
INFO:__main__:Best Balanced Accuracy Seen, validation/test: 0.74 0.75
!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!counter: 181, score: 0.5977777777777779, best
_score: 0.7401307189542483
INFO:__main__:Epoch: 601 | Total Loss: 0.60 | Balanced Accuracy: 0.63
INFO:__main__:Best Balanced Accuracy Seen, validation/test: 0.74 0.75
!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!counter: 182, score: 0.628562091503268, best_
score: 0.7401307189542483
INFO:__main__:Epoch: 602 | Total Loss: 0.61 | Balanced Accuracy: 0.60
INFO:__main__:Best Balanced Accuracy Seen, validation/test: 0.74 0.75
!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!counter: 183, score: 0.5998039215686275, best
_score: 0.7401307189542483
INFO:__main__:Epoch: 603 | Total Loss: 0.60 | Balanced Accuracy: 0.63
INFO:__main__:Best Balanced Accuracy Seen, validation/test: 0.74 0.75
!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!counter: 184, score: 0.6281699346405228, best
_score: 0.7401307189542483
INFO:__main__:Epoch: 604 | Total Loss: 0.52 | Balanced Accuracy: 0.64
INFO:__main__:Best Balanced Accuracy Seen, validation/test: 0.74 0.75
!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!counter: 185, score: 0.6379738562091503, best
_score: 0.7401307189542483
INFO:__main__:Epoch: 605 | Total Loss: 0.61 | Balanced Accuracy: 0.59
INFO:__main__:Best Balanced Accuracy Seen, validation/test: 0.74 0.75
!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!counter: 186, score: 0.5911764705882353, best
_score: 0.7401307189542483
INFO:__main__:Epoch: 606 | Total Loss: 0.62 | Balanced Accuracy: 0.57
INFO:__main__:Best Balanced Accuracy Seen, validation/test: 0.74 0.75
!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!counter: 187, score: 0.5703267973856209, best
_score: 0.7401307189542483
INFO:__main__:Epoch: 607 | Total Loss: 0.57 | Balanced Accuracy: 0.64
INFO:__main__:Best Balanced Accuracy Seen, validation/test: 0.74 0.75
!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!counter: 188, score: 0.6375816993464052, best
_score: 0.7401307189542483
INFO:__main__:Epoch: 608 | Total Loss: 0.66 | Balanced Accuracy: 0.59
INFO:__main__:Best Balanced Accuracy Seen, validation/test: 0.74 0.75
!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!counter: 189, score: 0.592156862745098, best_
score: 0.7401307189542483
INFO:__main__:Epoch: 609 | Total Loss: 0.62 | Balanced Accuracy: 0.65
INFO:__main__:Best Balanced Accuracy Seen, validation/test: 0.74 0.75
!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!counter: 190, score: 0.6537908496732027, best
_score: 0.7401307189542483
INFO:__main__:Epoch: 610 | Total Loss: 0.55 | Balanced Accuracy: 0.62
INFO:__main__:Best Balanced Accuracy Seen, validation/test: 0.74 0.75
!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!counter: 191, score: 0.6209150326797386, best
_score: 0.7401307189542483
```

```
INFO:__main__:Epoch: 611 | Total Loss: 0.54 | Balanced Accuracy: 0.64
INFO:__main__:Best Balanced Accuracy Seen, validation/test: 0.74 0.75
!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!counter: 192, score: 0.6409803921568628, best
_score: 0.7401307189542483
INFO:__main__:Epoch: 612 | Total Loss: 0.62 | Balanced Accuracy: 0.67
INFO:__main__:Best Balanced Accuracy Seen, validation/test: 0.74 0.75
!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!counter: 193, score: 0.6713071895424836, best
_score: 0.7401307189542483
INFO:__main__:Epoch: 613 | Total Loss: 0.54 | Balanced Accuracy: 0.64
INFO:__main__:Best Balanced Accuracy Seen, validation/test: 0.74 0.75
!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!counter: 194, score: 0.6403921568627451, best
_score: 0.7401307189542483
INFO:__main__:Epoch: 614 | Total Loss: 0.56 | Balanced Accuracy: 0.67
INFO:__main__:Best Balanced Accuracy Seen, validation/test: 0.74 0.75
!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!counter: 195, score: 0.6665359477124183, best
_score: 0.7401307189542483
INFO:__main__:Epoch: 615 | Total Loss: 0.52 | Balanced Accuracy: 0.65
INFO:__main__:Best Balanced Accuracy Seen, validation/test: 0.74 0.75
!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!counter: 196, score: 0.653921568627451, best_
score: 0.7401307189542483
INFO:__main__:Epoch: 616 | Total Loss: 0.59 | Balanced Accuracy: 0.60
INFO:__main__:Best Balanced Accuracy Seen, validation/test: 0.74 0.75
!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!counter: 197, score: 0.6015686274509804, best
_score: 0.7401307189542483
INFO:__main__:Epoch: 617 | Total Loss: 0.72 | Balanced Accuracy: 0.61
INFO:__main__:Best Balanced Accuracy Seen, validation/test: 0.74 0.75
!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!counter: 198, score: 0.6145098039215686, best
_score: 0.7401307189542483
INFO:__main__:Epoch: 618 | Total Loss: 0.80 | Balanced Accuracy: 0.64
INFO:__main__:Best Balanced Accuracy Seen, validation/test: 0.74 0.75
!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!counter: 199, score: 0.6370588235294118, best
_score: 0.7401307189542483
INFO:__main__:Epoch: 619 | Total Loss: 0.71 | Balanced Accuracy: 0.62
INFO:__main__:Best Balanced Accuracy Seen, validation/test: 0.74 0.75
!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!counter: 200, score: 0.6230065359477125, best
_score: 0.7401307189542483
```

## Bag-Level (Study Level) Pre Training

This block configures training the SAMIL model with Bag (Study) Level pretraining. Per the paper, the max epochs is set to 2,000 with a warmup of 200 epochs and patient of 200 epochs.

The MIL\_checkpoint\_path and view\_checkpoint\_path point to the appropriate model for this ablation.

```
In [ ]: RUNS_DIR = '/content/runs/'

from torch.utils.data import DataLoader

train_loader = DataLoader(
    train_dataset_randaug, batch_size=1, shuffle=True, num_workers=8
)
val_loader = DataLoader(val_dataset, batch_size=1, shuffle=False, num_workers=8)
test_loader = DataLoader(test_dataset, batch_size=1, shuffle=False, num_workers=8)

training_seed= 0
data_seed= 0
checkpoint_dir= MODEL_CHECKPOINTS
MIL_checkpoint_path= ''
lr= 0.0005 # learning rate
wd= 0.0001 # weight decay
T= 0.1 # temperture
lambda_ViewRegularization= 15.0 # λsA
train_dir= RUNS_DIR + 'SAMIL'
resume= 'None'
train_epoch= 2000 # number of epochs, 2000 defined in the paper. CHANGE ME!
device= device
start_epoch= 0
patience= 200
early_stopping_warmup= 200
ViewRegularization_warmup_pos= 0.4
eval_every_Xepoch= 1
experiment_type='StudyLevel'

set_seed(training_seed)
MIL_checkpoint_path = os.path.join(checkpoint_dir, 'MOCO_Pretraining_StudyLevel', 's')
view_checkpoint_path = os.path.join(checkpoint_dir, 'view_classifier', 'seed0_model')

experiment_name = "{}".format(experiment_type)
experiment_dir = os.path.join(train_dir, experiment_name)
os.makedirs(experiment_dir, exist_ok=True)

weights = '0.463,0.342,0.195'
weights = [float(i) for i in weights.split(',')]
weights = torch.Tensor(weights)
weights = weights.to(device)

view_model = create_view_model(view_checkpoint_path).to(device)

model = create_model(MIL_checkpoint_path).to(device)

no_decay = {'bias', 'bn'}
grouped_parameters = [
    {'params': [p for n, p in model.named_parameters() if not any(
        nd in n for nd in no_decay)], 'weight_decay': wd},
    {'params': [p for n, p in model.named_parameters() if any(
        nd in n for nd in no_decay)], 'weight_decay': 0.0}
]

optimizer = optim.SGD(grouped_parameters, lr=lr, momentum=0.9, nesterov=True)
scheduler = get_cosine_schedule_with_warmup(optimizer, 0, train_epoch)

train_samil(
    train_epoch,
```

```
    patience,
    early_stopping_warmup,
    eval_every_Xepoch,
    experiment_type,
    experiment_dir,
    weights,
    train_loader,
    val_loader,
    model,
    view_model,
    optimizer,
    scheduler,
    lambda_ViewRegularization,
    ViewRegularization_warmup_pos,
    T
)
```

```
INFO:__main__:Total params for View Model: 5.93M
INFO:__main__:Total params: 2.31M
INFO:__main__:***** Running training *****
INFO:__main__: Num Epochs = 2000
INFO:__main__: Total optimization steps = 720000
Using checkpoint path: /content/model_checkpoints/MOC0_Pretraining_StudyLevel/seed0
_checkpoint.pt
```













INFO:\_\_main\_\_:Best Balanced Accuracy Seen, validation/test: 0.71 0.74  
INFO:\_\_main\_\_:Epoch: 180 | Total Loss: 0.85 | Balanced Accuracy: 0.61  
INFO:\_\_main\_\_:Best Balanced Accuracy Seen, validation/test: 0.71 0.74  
INFO:\_\_main\_\_:Epoch: 181 | Total Loss: 0.79 | Balanced Accuracy: 0.61  
INFO:\_\_main\_\_:Best Balanced Accuracy Seen, validation/test: 0.71 0.74  
INFO:\_\_main\_\_:Epoch: 182 | Total Loss: 0.74 | Balanced Accuracy: 0.62  
INFO:\_\_main\_\_:Best Balanced Accuracy Seen, validation/test: 0.71 0.74  
INFO:\_\_main\_\_:Epoch: 183 | Total Loss: 0.84 | Balanced Accuracy: 0.67  
INFO:\_\_main\_\_:Best Balanced Accuracy Seen, validation/test: 0.71 0.74  
INFO:\_\_main\_\_:Epoch: 184 | Total Loss: 0.81 | Balanced Accuracy: 0.66  
INFO:\_\_main\_\_:Best Balanced Accuracy Seen, validation/test: 0.71 0.74  
INFO:\_\_main\_\_:Epoch: 185 | Total Loss: 0.75 | Balanced Accuracy: 0.64  
INFO:\_\_main\_\_:Best Balanced Accuracy Seen, validation/test: 0.71 0.74  
INFO:\_\_main\_\_:Epoch: 186 | Total Loss: 0.73 | Balanced Accuracy: 0.50  
INFO:\_\_main\_\_:Best Balanced Accuracy Seen, validation/test: 0.71 0.74  
INFO:\_\_main\_\_:Epoch: 187 | Total Loss: 0.82 | Balanced Accuracy: 0.64  
INFO:\_\_main\_\_:Best Balanced Accuracy Seen, validation/test: 0.71 0.74  
INFO:\_\_main\_\_:Epoch: 188 | Total Loss: 0.83 | Balanced Accuracy: 0.60  
INFO:\_\_main\_\_:Best Balanced Accuracy Seen, validation/test: 0.71 0.74  
INFO:\_\_main\_\_:Epoch: 189 | Total Loss: 0.78 | Balanced Accuracy: 0.55  
INFO:\_\_main\_\_:Best Balanced Accuracy Seen, validation/test: 0.71 0.74  
INFO:\_\_main\_\_:Epoch: 190 | Total Loss: 0.75 | Balanced Accuracy: 0.60  
INFO:\_\_main\_\_:Best Balanced Accuracy Seen, validation/test: 0.71 0.74  
INFO:\_\_main\_\_:Epoch: 191 | Total Loss: 0.81 | Balanced Accuracy: 0.66  
INFO:\_\_main\_\_:Best Balanced Accuracy Seen, validation/test: 0.71 0.74  
INFO:\_\_main\_\_:Epoch: 192 | Total Loss: 0.76 | Balanced Accuracy: 0.62  
INFO:\_\_main\_\_:Best Balanced Accuracy Seen, validation/test: 0.71 0.74  
INFO:\_\_main\_\_:Epoch: 193 | Total Loss: 0.74 | Balanced Accuracy: 0.60  
INFO:\_\_main\_\_:Best Balanced Accuracy Seen, validation/test: 0.71 0.74  
INFO:\_\_main\_\_:Epoch: 194 | Total Loss: 0.71 | Balanced Accuracy: 0.61  
INFO:\_\_main\_\_:Best Balanced Accuracy Seen, validation/test: 0.71 0.74  
INFO:\_\_main\_\_:Epoch: 195 | Total Loss: 0.69 | Balanced Accuracy: 0.61  
INFO:\_\_main\_\_:Best Balanced Accuracy Seen, validation/test: 0.71 0.74  
INFO:\_\_main\_\_:Epoch: 196 | Total Loss: 0.76 | Balanced Accuracy: 0.47  
INFO:\_\_main\_\_:Best Balanced Accuracy Seen, validation/test: 0.71 0.74  
INFO:\_\_main\_\_:Epoch: 197 | Total Loss: 0.73 | Balanced Accuracy: 0.51  
INFO:\_\_main\_\_:Best Balanced Accuracy Seen, validation/test: 0.71 0.74  
INFO:\_\_main\_\_:Epoch: 198 | Total Loss: 0.78 | Balanced Accuracy: 0.59  
INFO:\_\_main\_\_:Best Balanced Accuracy Seen, validation/test: 0.71 0.74  
INFO:\_\_main\_\_:Epoch: 199 | Total Loss: 0.71 | Balanced Accuracy: 0.61  
INFO:\_\_main\_\_:Best Balanced Accuracy Seen, validation/test: 0.71 0.74  
INFO:\_\_main\_\_:Epoch: 200 | Total Loss: 0.74 | Balanced Accuracy: 0.55  
INFO:\_\_main\_\_:Best Balanced Accuracy Seen, validation/test: 0.71 0.74  
INFO:\_\_main\_\_:Epoch: 201 | Total Loss: 0.75 | Balanced Accuracy: 0.50  
INFO:\_\_main\_\_:Best Balanced Accuracy Seen, validation/test: 0.71 0.74  
!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!counter: 0, score: 0.5034640522875817, best\_s  
core: 0.5034640522875817  
INFO:\_\_main\_\_:Epoch: 202 | Total Loss: 0.73 | Balanced Accuracy: 0.67  
INFO:\_\_main\_\_:Best Balanced Accuracy Seen, validation/test: 0.71 0.74  
!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!counter: 0, score: 0.6716993464052288, best\_s  
core: 0.6716993464052288  
INFO:\_\_main\_\_:Epoch: 203 | Total Loss: 0.70 | Balanced Accuracy: 0.65  
INFO:\_\_main\_\_:Best Balanced Accuracy Seen, validation/test: 0.71 0.74  
!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!counter: 1, score: 0.6498692810457517, best\_s  
core: 0.6716993464052288  
INFO:\_\_main\_\_:Epoch: 204 | Total Loss: 0.72 | Balanced Accuracy: 0.61  
INFO:\_\_main\_\_:Best Balanced Accuracy Seen, validation/test: 0.71 0.74  
!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!counter: 2, score: 0.6094117647058823, best\_s  
core: 0.6716993464052288

```
INFO:__main__:Epoch: 205 | Total Loss: 0.74 | Balanced Accuracy: 0.67
INFO:__main__:Best Balanced Accuracy Seen, validation/test: 0.71 0.74
!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!counter: 0, score: 0.6718954248366013, best_s
core: 0.6718954248366013
INFO:__main__:Epoch: 206 | Total Loss: 0.67 | Balanced Accuracy: 0.56
INFO:__main__:Best Balanced Accuracy Seen, validation/test: 0.71 0.74
!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!counter: 1, score: 0.5577124183006537, best_s
core: 0.6718954248366013
INFO:__main__:Epoch: 207 | Total Loss: 0.78 | Balanced Accuracy: 0.64
INFO:__main__:Best Balanced Accuracy Seen, validation/test: 0.71 0.74
!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!counter: 2, score: 0.6398039215686274, best_s
core: 0.6718954248366013
INFO:__main__:Epoch: 208 | Total Loss: 0.74 | Balanced Accuracy: 0.64
INFO:__main__:Best Balanced Accuracy Seen, validation/test: 0.71 0.74
!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!counter: 3, score: 0.643921568627451, best_sc
ore: 0.6718954248366013
INFO:__main__:Epoch: 209 | Total Loss: 0.73 | Balanced Accuracy: 0.55
INFO:__main__:Best Balanced Accuracy Seen, validation/test: 0.71 0.74
!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!counter: 4, score: 0.5505228758169936, best_s
core: 0.6718954248366013
INFO:__main__:Epoch: 210 | Total Loss: 0.74 | Balanced Accuracy: 0.65
INFO:__main__:Best Balanced Accuracy Seen, validation/test: 0.71 0.74
!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!counter: 5, score: 0.6504575163398694, best_s
core: 0.6718954248366013
INFO:__main__:Epoch: 211 | Total Loss: 0.63 | Balanced Accuracy: 0.57
INFO:__main__:Best Balanced Accuracy Seen, validation/test: 0.71 0.74
!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!counter: 6, score: 0.574640522875817, best_sc
ore: 0.6718954248366013
INFO:__main__:Epoch: 212 | Total Loss: 0.66 | Balanced Accuracy: 0.57
INFO:__main__:Best Balanced Accuracy Seen, validation/test: 0.71 0.74
!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!counter: 7, score: 0.574640522875817, best_sc
ore: 0.6718954248366013
INFO:__main__:Epoch: 213 | Total Loss: 0.74 | Balanced Accuracy: 0.49
INFO:__main__:Best Balanced Accuracy Seen, validation/test: 0.71 0.74
!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!counter: 8, score: 0.4886274509803921, best_s
core: 0.6718954248366013
INFO:__main__:Epoch: 214 | Total Loss: 0.72 | Balanced Accuracy: 0.53
INFO:__main__:Best Balanced Accuracy Seen, validation/test: 0.71 0.74
!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!counter: 9, score: 0.529607843137255, best_sc
ore: 0.6718954248366013
INFO:__main__:Epoch: 215 | Total Loss: 0.76 | Balanced Accuracy: 0.60
INFO:__main__:Best Balanced Accuracy Seen, validation/test: 0.71 0.74
!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!counter: 10, score: 0.6034640522875817, best_
score: 0.6718954248366013
```

```
Exception ignored in: Exception ignored in: Exception ignored in: <function _MultiP  
rocessingDataLoaderIter.__del__ at 0x7d81802ce0e0><function _MultiProcessingDataLo  
aderIter.__del__ at 0x7d81802ce0e0><function _MultiProcessingDataLoaderIter.__del__  
at 0x7d81802ce0e0>Exception ignored in:  
<function _MultiProcessingDataLoaderIter.__del__ at 0x7d81802ce0e0>  
Exception ignored in: Exception ignored in: Traceback (most recent call last):  
  
<function _MultiProcessingDataLoaderIter.__del__ at 0x7d81802ce0e0><function _Multi  
ProcessingDataLoaderIter.__del__ at 0x7d81802ce0e0>Traceback (most recent call las  
t):  
  File "/usr/local/lib/python3.10/dist-packages/torch/utils/data/dataloader.py", li  
ne 1479, in __del__  
Exception ignored in:  
  
Traceback (most recent call last):  
<function _MultiProcessingDataLoaderIter.__del__ at 0x7d81802ce0e0>      Traceback (m  
ost recent call last):  
  File "/usr/local/lib/python3.10/dist-packages/torch/utils/data/dataloader.py", li  
ne 1479, in __del__  
  File "/usr/local/lib/python3.10/dist-packages/torch/utils/data/dataloader.py", li  
ne 1479, in __del__  
  
  File "/usr/local/lib/python3.10/dist-packages/torch/utils/data/dataloader.py", li  
ne 1479, in __del__  
    self._shutdown_workers()self._shutdown_workers()  
  
Traceback (most recent call last):  
  File "/usr/local/lib/python3.10/dist-packages/torch/utils/data/dataloader.p  
y", line 1479, in __del__  
  File "/usr/local/lib/python3.10/dist-packages/torch/utils/data/dataloader.py", li  
ne 1462, in _shutdown_workers  
  File "/usr/local/lib/python3.10/dist-packages/torch/utils/data/dataloader.py", li  
ne 1462, in _shutdown_workers  
  
    self._shutdown_workers()Traceback (most recent call last):  
  
      self._shutdown_workers()Traceback (most recent call last):  
    File "/usr/local/lib/python3.10/dist-packages/torch/utils/data/dataloader.py", li  
ne 1479, in __del__  
    File "/usr/local/lib/python3.10/dist-packages/torch/utils/data/dataloader.py", li  
ne 1462, in _shutdown_workers  
    self._shutdown_workers()if w.is_alive():  
      File "/usr/local/lib/python3.10/dist-packages/torch/utils/data/dataloader.py", li  
ne 1479, in __del__  
    if w.is_alive():  
  
      File "/usr/lib/python3.10/multiprocessing/process.py", line 160, in is_alive  
  
        Exception ignored in:  File "/usr/local/lib/python3.10/dist-packages/torch/uti  
ls/data/dataloader.py", line 1462, in _shutdown_workers  
        self._shutdown_workers()self._shutdown_workers()  File "/usr/local/lib/python3.10/d  
ist-packages/torch/utils/data/dataloader.py", line 1462, in _shutdown_workers  
          if w.is_alive():  File "/usr/lib/python3.10/multiprocessing/process.py", line 1  
60, in is_alive  
<function _MultiProcessingDataLoaderIter.__del__ at 0x7d81802ce0e0>  
assert self._parent_pid == os.getpid(), 'can only test a child process'  
  
  if w.is_alive():
```

```
    File "/usr/local/lib/python3.10/dist-packages/torch/utils/data/dataloader.py", li
ne 1462, in _shutdown_workers
        File "/usr/local/lib/python3.10/dist-packages/torch/utils/data/dataloader.py", li
ne 1462, in _shutdown_workers
            File "/usr/lib/python3.10/multiprocessing/process.py", line 160, in is_alive
            if w.is_alive():
                assert self._parent_pid == os.getpid(), 'can only test a child process'    Assertion
nError
                Traceback (most recent call last):
: assert self._parent_pid == os.getpid(), 'can only test a child process'
if w.is_alive():  File "/usr/lib/python3.10/multiprocessing/process.py", line 160,
in is_alive
AssertionError  File "/usr/local/lib/python3.10/dist-packages/torch/utils/data/datalo
ader.py", line 1479, in __del__
if w.is_alive():can only test a child process

        File "/usr/lib/python3.10/multiprocessing/process.py", line 160, in is_alive
:

AssertionError      assert self._parent_pid == os.getpid(), 'can only test a child pr
ocess'      File "/usr/lib/python3.10/multiprocessing/process.py", line 160, in is_
alive
: can only test a child process  File "/usr/lib/python3.10/multiprocessing/process.
py", line 160, in is_alive
self._shutdown_workers()assert self._parent_pid == os.getpid(), 'can only test a ch
ild process'

can only test a child process
assert self._parent_pid == os.getpid(), 'can only test a child process'AssertionErr
orassert self._parent_pid == os.getpid(), 'can only test a child process'
Exception ignored in:
<function _MultiProcessingDataLoaderIter.__del__ at 0x7d81802ce0e0>
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can only test a child process  File "/usr/local/lib/python3.10/dist-packages/torch/
utils/data/dataloader.py", line 1479, in __del__
        File "/usr/local/lib/python3.10/dist-packages/torch/utils/data/dataloader.py", li
ne 1462, in _shutdown_workers
AssertionError      Exception ignored in:
if w.is_alive():AssertionError<function _MultiProcessingDataLoaderIter.__del__ at 0
x7d81802ce0e0>

Traceback (most recent call last):
        File "/usr/local/lib/python3.10/dist-packages/torch/utils/data/dataloader.py", li
ne 1479, in __del__

Exception ignored in:      : : can only test a child process  File "/usr/lib/python
3.10/multiprocessing/process.py", line 160, in is_alive

self._shutdown_workers()<function _MultiProcessingDataLoaderIter.__del__ at 0x7d818
02ce0e0>self._shutdown_workers()
AssertionErrorcan only test a child process  File "/usr/local/lib/python3.10/di
st-packages/torch/utils/data/dataloader.py", line 1462, in _shutdown_workers

assert self._parent_pid == os.getpid(), 'can only test a child process'Exception ig
ored in:

Exception ignored in:      :
can only test a child processAssertionError:
<function _MultiProcessingDataLoaderIter.__del__ at 0x7d81802ce0e0>can only test a
```

```
child process
Traceback (most recent call last):
  File "/usr/local/lib/python3.10/dist-packages/torch/utils/data/dataloader.py", line 1462, in _shutdown_workers
    File "/usr/local/lib/python3.10/dist-packages/torch/utils/data/dataloader.py", line 1479, in __del__
      <function _MultiProcessingDataLoaderIter.__del__ at 0x7d81802ce0e0>

if w.is_alive():Traceback (most recent call last):
Traceback (most recent call last):

Exception ignored in:  File "/usr/local/lib/python3.10/dist-packages/torch/utils/data/dataloader.py", line 1479, in __del__
if w.is_alive():  File "/usr/lib/python3.10/multiprocessing/process.py", line 160, in is_alive
    File "/usr/local/lib/python3.10/dist-packages/torch/utils/data/dataloader.py", line 1479, in __del__
      <function _MultiProcessingDataLoaderIter.__del__ at 0x7d81802ce0e0>  Exception ignored in:  <function _MultiProcessingDataLoaderIter.__del__ at 0x7d81802ce0e0>Exception ignored in: self._shutdown_workers()
assert self._parent_pid == os.getpid(), 'can only test a child process'
self._shutdown_workers()<function _MultiProcessingDataLoaderIter.__del__ at 0x7d81802ce0e0>
  File "/usr/local/lib/python3.10/dist-packages/torch/utils/data/dataloader.py", line 1462, in _shutdown_workers

Traceback (most recent call last):
self._shutdown_workers()
  File "/usr/lib/python3.10/multiprocessing/process.py", line 160, in is_alive

Traceback (most recent call last):
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  AssertionError  File "/usr/local/lib/python3.10/dist-packages/torch/utils/data/dataloader.py", line 1462, in _shutdown_workers
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AssertionError: can only test a child process
INFO:__main__:Epoch: 216 | Total Loss: 0.70 | Balanced Accuracy: 0.65
INFO:__main__:Best Balanced Accuracy Seen, validation/test: 0.71 0.74
!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!counter: 11, score: 0.6483660130718955, best_score: 0.6718954248366013
INFO:__main__:Epoch: 217 | Total Loss: 0.75 | Balanced Accuracy: 0.47
INFO:__main__:Best Balanced Accuracy Seen, validation/test: 0.71 0.74
!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!counter: 12, score: 0.47169934640522876, best_score: 0.6718954248366013
INFO:__main__:Epoch: 218 | Total Loss: 0.69 | Balanced Accuracy: 0.64
INFO:__main__:Best Balanced Accuracy Seen, validation/test: 0.71 0.74
!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!counter: 13, score: 0.6432679738562092, best_score: 0.6718954248366013
INFO:__main__:Epoch: 219 | Total Loss: 0.69 | Balanced Accuracy: 0.69
INFO:__main__:Best Balanced Accuracy Seen, validation/test: 0.71 0.74
!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!counter: 0, score: 0.689673202614379, best_score: 0.689673202614379
INFO:__main__:Epoch: 220 | Total Loss: 0.61 | Balanced Accuracy: 0.56
INFO:__main__:Best Balanced Accuracy Seen, validation/test: 0.71 0.74
```

```
!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!counter: 1, score: 0.5608496732026144, best_s
core: 0.689673202614379
INFO:__main__:Epoch: 221 | Total Loss: 0.64 | Balanced Accuracy: 0.66
INFO:__main__:Best Balanced Accuracy Seen, validation/test: 0.71 0.74
!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!counter: 2, score: 0.6596732026143791, best_s
core: 0.689673202614379
INFO:__main__:Epoch: 222 | Total Loss: 0.76 | Balanced Accuracy: 0.61
INFO:__main__:Best Balanced Accuracy Seen, validation/test: 0.71 0.74
!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!counter: 3, score: 0.6080392156862745, best_s
core: 0.689673202614379
INFO:__main__:Epoch: 223 | Total Loss: 0.70 | Balanced Accuracy: 0.60
INFO:__main__:Best Balanced Accuracy Seen, validation/test: 0.71 0.74
!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!counter: 4, score: 0.5984967320261437, best_s
core: 0.689673202614379
INFO:__main__:Epoch: 224 | Total Loss: 0.72 | Balanced Accuracy: 0.60
INFO:__main__:Best Balanced Accuracy Seen, validation/test: 0.71 0.74
!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!counter: 5, score: 0.5997385620915033, best_s
core: 0.689673202614379
INFO:__main__:Epoch: 225 | Total Loss: 0.65 | Balanced Accuracy: 0.61
INFO:__main__:Best Balanced Accuracy Seen, validation/test: 0.71 0.74
!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!counter: 6, score: 0.6079738562091502, best_s
core: 0.689673202614379
INFO:__main__:Epoch: 226 | Total Loss: 0.74 | Balanced Accuracy: 0.64
INFO:__main__:Best Balanced Accuracy Seen, validation/test: 0.71 0.74
!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!counter: 7, score: 0.6416339869281046, best_s
core: 0.689673202614379
INFO:__main__:Epoch: 227 | Total Loss: 0.74 | Balanced Accuracy: 0.55
INFO:__main__:Best Balanced Accuracy Seen, validation/test: 0.71 0.74
!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!counter: 8, score: 0.5526797385620915, best_s
core: 0.689673202614379
INFO:__main__:Epoch: 228 | Total Loss: 0.64 | Balanced Accuracy: 0.53
INFO:__main__:Best Balanced Accuracy Seen, validation/test: 0.71 0.74
!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!counter: 9, score: 0.5301960784313725, best_s
core: 0.689673202614379
INFO:__main__:Epoch: 229 | Total Loss: 0.73 | Balanced Accuracy: 0.67
INFO:__main__:Best Balanced Accuracy Seen, validation/test: 0.71 0.74
!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!counter: 10, score: 0.6693464052287581, best_
score: 0.689673202614379
INFO:__main__:Epoch: 230 | Total Loss: 0.75 | Balanced Accuracy: 0.68
INFO:__main__:Best Balanced Accuracy Seen, validation/test: 0.71 0.74
!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!counter: 11, score: 0.67718954248366, best_sc
ore: 0.689673202614379
INFO:__main__:Epoch: 231 | Total Loss: 0.68 | Balanced Accuracy: 0.55
INFO:__main__:Best Balanced Accuracy Seen, validation/test: 0.71 0.74
!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!counter: 12, score: 0.5513071895424836, best_
score: 0.689673202614379
INFO:__main__:Epoch: 232 | Total Loss: 0.67 | Balanced Accuracy: 0.61
INFO:__main__:Best Balanced Accuracy Seen, validation/test: 0.71 0.74
!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!counter: 13, score: 0.6058169934640523, best_
score: 0.689673202614379
INFO:__main__:Epoch: 233 | Total Loss: 0.69 | Balanced Accuracy: 0.63
INFO:__main__:Best Balanced Accuracy Seen, validation/test: 0.71 0.74
!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!counter: 14, score: 0.6341176470588236, best_
score: 0.689673202614379
INFO:__main__:Epoch: 234 | Total Loss: 0.79 | Balanced Accuracy: 0.52
INFO:__main__:Best Balanced Accuracy Seen, validation/test: 0.71 0.74
```

```
!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!counter: 15, score: 0.5169281045751634, best_
score: 0.689673202614379
INFO:__main__:Epoch: 235 | Total Loss: 0.66 | Balanced Accuracy: 0.66
INFO:__main__:Best Balanced Accuracy Seen, validation/test: 0.71 0.74
!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!counter: 16, score: 0.66, best_score: 0.68967
3202614379
INFO:__main__:Epoch: 236 | Total Loss: 0.69 | Balanced Accuracy: 0.67
INFO:__main__:Best Balanced Accuracy Seen, validation/test: 0.71 0.74
!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!counter: 17, score: 0.6725490196078431, best_
score: 0.689673202614379
INFO:__main__:Epoch: 237 | Total Loss: 0.70 | Balanced Accuracy: 0.69
INFO:__main__:Best Balanced Accuracy Seen, validation/test: 0.71 0.74
!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!counter: 0, score: 0.694640522875817, best_sc
ore: 0.694640522875817
INFO:__main__:Epoch: 238 | Total Loss: 0.73 | Balanced Accuracy: 0.53
INFO:__main__:Best Balanced Accuracy Seen, validation/test: 0.71 0.74
!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!counter: 1, score: 0.5343790849673203, best_s
core: 0.694640522875817
INFO:__main__:Epoch: 239 | Total Loss: 0.60 | Balanced Accuracy: 0.63
INFO:__main__:Best Balanced Accuracy Seen, validation/test: 0.71 0.74
!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!counter: 2, score: 0.6274509803921569, best_s
core: 0.694640522875817
INFO:__main__:Epoch: 240 | Total Loss: 0.67 | Balanced Accuracy: 0.50
INFO:__main__:Best Balanced Accuracy Seen, validation/test: 0.71 0.74
!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!counter: 3, score: 0.497843137254902, best_sc
ore: 0.694640522875817
INFO:__main__:Epoch: 241 | Total Loss: 0.73 | Balanced Accuracy: 0.63
INFO:__main__:Best Balanced Accuracy Seen, validation/test: 0.71 0.74
!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!counter: 4, score: 0.6284313725490196, best_s
core: 0.694640522875817
INFO:__main__:Epoch: 242 | Total Loss: 0.68 | Balanced Accuracy: 0.67
INFO:__main__:Best Balanced Accuracy Seen, validation/test: 0.71 0.74
!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!counter: 5, score: 0.6685620915032678, best_s
core: 0.694640522875817
INFO:__main__:Epoch: 243 | Total Loss: 0.62 | Balanced Accuracy: 0.63
INFO:__main__:Best Balanced Accuracy Seen, validation/test: 0.71 0.74
!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!counter: 6, score: 0.6341176470588236, best_s
core: 0.694640522875817
INFO:__main__:Epoch: 244 | Total Loss: 0.73 | Balanced Accuracy: 0.66
INFO:__main__:Best Balanced Accuracy Seen, validation/test: 0.71 0.74
!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!counter: 7, score: 0.6557516339869282, best_s
core: 0.694640522875817
INFO:__main__:Epoch: 245 | Total Loss: 0.76 | Balanced Accuracy: 0.60
INFO:__main__:Best Balanced Accuracy Seen, validation/test: 0.71 0.74
!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!counter: 8, score: 0.5996732026143791, best_s
core: 0.694640522875817
INFO:__main__:Epoch: 246 | Total Loss: 0.62 | Balanced Accuracy: 0.67
INFO:__main__:Best Balanced Accuracy Seen, validation/test: 0.71 0.74
!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!counter: 9, score: 0.6686928104575164, best_s
core: 0.694640522875817
INFO:__main__:Epoch: 247 | Total Loss: 0.65 | Balanced Accuracy: 0.64
INFO:__main__:Best Balanced Accuracy Seen, validation/test: 0.71 0.74
!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!counter: 10, score: 0.6386928104575164, best_
score: 0.694640522875817
INFO:__main__:Epoch: 248 | Total Loss: 0.69 | Balanced Accuracy: 0.57
INFO:__main__:Best Balanced Accuracy Seen, validation/test: 0.71 0.74
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!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!counter: 11, score: 0.5715032679738562, best_
score: 0.694640522875817
INFO:__main__:Epoch: 249 | Total Loss: 0.67 | Balanced Accuracy: 0.66
INFO:__main__:Best Balanced Accuracy Seen, validation/test: 0.71 0.74
!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!counter: 12, score: 0.65640522875817, best_sc
ore: 0.694640522875817
INFO:__main__:Epoch: 250 | Total Loss: 0.74 | Balanced Accuracy: 0.60
INFO:__main__:Best Balanced Accuracy Seen, validation/test: 0.71 0.74
!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!counter: 13, score: 0.6024183006535947, best_
score: 0.694640522875817
INFO:__main__:Epoch: 251 | Total Loss: 0.73 | Balanced Accuracy: 0.63
INFO:__main__:Best Balanced Accuracy Seen, validation/test: 0.71 0.74
!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!counter: 14, score: 0.6323529411764706, best_
score: 0.694640522875817
INFO:__main__:Epoch: 252 | Total Loss: 0.66 | Balanced Accuracy: 0.59
INFO:__main__:Best Balanced Accuracy Seen, validation/test: 0.71 0.74
!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!counter: 15, score: 0.5859477124183007, best_
score: 0.694640522875817
INFO:__main__:Epoch: 253 | Total Loss: 0.63 | Balanced Accuracy: 0.63
INFO:__main__:Best Balanced Accuracy Seen, validation/test: 0.71 0.74
!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!counter: 16, score: 0.6252287581699346, best_
score: 0.694640522875817
INFO:__main__:Epoch: 254 | Total Loss: 0.64 | Balanced Accuracy: 0.67
INFO:__main__:Best Balanced Accuracy Seen, validation/test: 0.71 0.74
!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!counter: 17, score: 0.6716339869281045, best_
score: 0.694640522875817
INFO:__main__:Epoch: 255 | Total Loss: 0.62 | Balanced Accuracy: 0.64
INFO:__main__:Best Balanced Accuracy Seen, validation/test: 0.71 0.74
!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!counter: 18, score: 0.6447058823529411, best_
score: 0.694640522875817
INFO:__main__:Epoch: 256 | Total Loss: 0.64 | Balanced Accuracy: 0.59
INFO:__main__:Best Balanced Accuracy Seen, validation/test: 0.71 0.74
!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!counter: 19, score: 0.5879738562091504, best_
score: 0.694640522875817
INFO:__main__:Epoch: 257 | Total Loss: 0.63 | Balanced Accuracy: 0.54
INFO:__main__:Best Balanced Accuracy Seen, validation/test: 0.71 0.74
!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!counter: 20, score: 0.5386274509803922, best_
score: 0.694640522875817
INFO:__main__:Epoch: 258 | Total Loss: 0.57 | Balanced Accuracy: 0.60
INFO:__main__:Best Balanced Accuracy Seen, validation/test: 0.71 0.74
!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!counter: 21, score: 0.6027450980392157, best_
score: 0.694640522875817
INFO:__main__:Epoch: 259 | Total Loss: 0.78 | Balanced Accuracy: 0.66
INFO:__main__:Best Balanced Accuracy Seen, validation/test: 0.71 0.74
!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!counter: 22, score: 0.6606535947712419, best_
score: 0.694640522875817
INFO:__main__:Epoch: 260 | Total Loss: 0.66 | Balanced Accuracy: 0.47
INFO:__main__:Best Balanced Accuracy Seen, validation/test: 0.71 0.74
!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!counter: 23, score: 0.4694771241830065, best_
score: 0.694640522875817
INFO:__main__:Epoch: 261 | Total Loss: 0.67 | Balanced Accuracy: 0.63
INFO:__main__:Best Balanced Accuracy Seen, validation/test: 0.71 0.74
!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!counter: 24, score: 0.6288888888888889, best_
score: 0.694640522875817
INFO:__main__:Epoch: 262 | Total Loss: 0.61 | Balanced Accuracy: 0.58
INFO:__main__:Best Balanced Accuracy Seen, validation/test: 0.71 0.74
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!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!counter: 25, score: 0.5796078431372549, best_
score: 0.694640522875817
INFO:__main__:Epoch: 263 | Total Loss: 0.62 | Balanced Accuracy: 0.60
INFO:__main__:Best Balanced Accuracy Seen, validation/test: 0.71 0.74
!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!counter: 26, score: 0.5964705882352941, best_
score: 0.694640522875817
INFO:__main__:Epoch: 264 | Total Loss: 0.58 | Balanced Accuracy: 0.56
INFO:__main__:Best Balanced Accuracy Seen, validation/test: 0.71 0.74
!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!counter: 27, score: 0.5590196078431373, best_
score: 0.694640522875817
INFO:__main__:Epoch: 265 | Total Loss: 0.68 | Balanced Accuracy: 0.63
INFO:__main__:Best Balanced Accuracy Seen, validation/test: 0.71 0.74
!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!counter: 28, score: 0.6330065359477124, best_
score: 0.694640522875817
INFO:__main__:Epoch: 266 | Total Loss: 0.72 | Balanced Accuracy: 0.59
INFO:__main__:Best Balanced Accuracy Seen, validation/test: 0.71 0.74
!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!counter: 29, score: 0.5897385620915033, best_
score: 0.694640522875817
INFO:__main__:Epoch: 267 | Total Loss: 0.75 | Balanced Accuracy: 0.66
INFO:__main__:Best Balanced Accuracy Seen, validation/test: 0.71 0.74
!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!counter: 30, score: 0.6635947712418301, best_
score: 0.694640522875817
INFO:__main__:Epoch: 268 | Total Loss: 0.72 | Balanced Accuracy: 0.59
INFO:__main__:Best Balanced Accuracy Seen, validation/test: 0.71 0.74
!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!counter: 31, score: 0.5913725490196079, best_
score: 0.694640522875817
INFO:__main__:Epoch: 269 | Total Loss: 0.65 | Balanced Accuracy: 0.66
INFO:__main__:Best Balanced Accuracy Seen, validation/test: 0.71 0.74
!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!counter: 32, score: 0.6587581699346404, best_
score: 0.694640522875817
INFO:__main__:Epoch: 270 | Total Loss: 0.61 | Balanced Accuracy: 0.54
INFO:__main__:Best Balanced Accuracy Seen, validation/test: 0.71 0.74
!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!counter: 33, score: 0.5415032679738562, best_
score: 0.694640522875817
INFO:__main__:Epoch: 271 | Total Loss: 0.64 | Balanced Accuracy: 0.66
INFO:__main__:Best Balanced Accuracy Seen, validation/test: 0.71 0.74
!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!counter: 34, score: 0.6577124183006536, best_
score: 0.694640522875817
INFO:__main__:Epoch: 272 | Total Loss: 0.65 | Balanced Accuracy: 0.58
INFO:__main__:Best Balanced Accuracy Seen, validation/test: 0.71 0.74
!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!counter: 35, score: 0.5822222222222222, best_
score: 0.694640522875817
INFO:__main__:Epoch: 273 | Total Loss: 0.60 | Balanced Accuracy: 0.60
INFO:__main__:Best Balanced Accuracy Seen, validation/test: 0.71 0.74
!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!counter: 36, score: 0.5970588235294118, best_
score: 0.694640522875817
INFO:__main__:Epoch: 274 | Total Loss: 0.56 | Balanced Accuracy: 0.65
INFO:__main__:Best Balanced Accuracy Seen, validation/test: 0.71 0.74
!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!counter: 37, score: 0.6487581699346405, best_
score: 0.694640522875817
INFO:__main__:Epoch: 275 | Total Loss: 0.62 | Balanced Accuracy: 0.61
INFO:__main__:Best Balanced Accuracy Seen, validation/test: 0.71 0.74
!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!counter: 38, score: 0.6087581699346405, best_
score: 0.694640522875817
INFO:__main__:Epoch: 276 | Total Loss: 0.67 | Balanced Accuracy: 0.57
INFO:__main__:Best Balanced Accuracy Seen, validation/test: 0.71 0.74
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!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!counter: 39, score: 0.5681699346405229, best\_score: 0.694640522875817  
INFO:\_\_main\_\_:Epoch: 277 | Total Loss: 0.62 | Balanced Accuracy: 0.60  
INFO:\_\_main\_\_:Best Balanced Accuracy Seen, validation/test: 0.71 0.74  
!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!counter: 40, score: 0.5954901960784315, best\_score: 0.694640522875817  
INFO:\_\_main\_\_:Epoch: 278 | Total Loss: 0.62 | Balanced Accuracy: 0.53  
INFO:\_\_main\_\_:Best Balanced Accuracy Seen, validation/test: 0.71 0.74  
!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!counter: 41, score: 0.5322875816993464, best\_score: 0.694640522875817  
INFO:\_\_main\_\_:Epoch: 279 | Total Loss: 0.60 | Balanced Accuracy: 0.59  
INFO:\_\_main\_\_:Best Balanced Accuracy Seen, validation/test: 0.71 0.74  
!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!counter: 42, score: 0.5933986928104575, best\_score: 0.694640522875817  
INFO:\_\_main\_\_:Epoch: 280 | Total Loss: 0.74 | Balanced Accuracy: 0.54  
INFO:\_\_main\_\_:Best Balanced Accuracy Seen, validation/test: 0.71 0.74  
!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!counter: 43, score: 0.5406535947712419, best\_score: 0.694640522875817  
INFO:\_\_main\_\_:Epoch: 281 | Total Loss: 0.58 | Balanced Accuracy: 0.58  
INFO:\_\_main\_\_:Best Balanced Accuracy Seen, validation/test: 0.71 0.74  
!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!counter: 44, score: 0.5775816993464052, best\_score: 0.694640522875817  
INFO:\_\_main\_\_:Epoch: 282 | Total Loss: 0.62 | Balanced Accuracy: 0.63  
INFO:\_\_main\_\_:Best Balanced Accuracy Seen, validation/test: 0.71 0.74  
!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!counter: 45, score: 0.6333333333333334, best\_score: 0.694640522875817  
INFO:\_\_main\_\_:Epoch: 283 | Total Loss: 0.59 | Balanced Accuracy: 0.58  
INFO:\_\_main\_\_:Best Balanced Accuracy Seen, validation/test: 0.71 0.74  
!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!counter: 46, score: 0.5837254901960784, best\_score: 0.694640522875817  
INFO:\_\_main\_\_:Epoch: 284 | Total Loss: 0.72 | Balanced Accuracy: 0.58  
INFO:\_\_main\_\_:Best Balanced Accuracy Seen, validation/test: 0.71 0.74  
!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!counter: 47, score: 0.5809803921568627, best\_score: 0.694640522875817  
INFO:\_\_main\_\_:Epoch: 285 | Total Loss: 0.72 | Balanced Accuracy: 0.66  
INFO:\_\_main\_\_:Best Balanced Accuracy Seen, validation/test: 0.71 0.74  
!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!counter: 48, score: 0.6589542483660131, best\_score: 0.694640522875817  
INFO:\_\_main\_\_:Epoch: 286 | Total Loss: 0.68 | Balanced Accuracy: 0.63  
INFO:\_\_main\_\_:Best Balanced Accuracy Seen, validation/test: 0.71 0.74  
!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!counter: 49, score: 0.6265359477124184, best\_score: 0.694640522875817  
INFO:\_\_main\_\_:Epoch: 287 | Total Loss: 0.86 | Balanced Accuracy: 0.66  
INFO:\_\_main\_\_:Best Balanced Accuracy Seen, validation/test: 0.71 0.74  
!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!counter: 50, score: 0.6633333333333332, best\_score: 0.694640522875817  
INFO:\_\_main\_\_:Epoch: 288 | Total Loss: 0.75 | Balanced Accuracy: 0.64  
INFO:\_\_main\_\_:Best Balanced Accuracy Seen, validation/test: 0.71 0.74  
!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!counter: 51, score: 0.6350326797385621, best\_score: 0.694640522875817  
INFO:\_\_main\_\_:Epoch: 289 | Total Loss: 0.58 | Balanced Accuracy: 0.65  
INFO:\_\_main\_\_:Best Balanced Accuracy Seen, validation/test: 0.71 0.74  
!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!counter: 52, score: 0.6510457516339869, best\_score: 0.694640522875817  
INFO:\_\_main\_\_:Epoch: 290 | Total Loss: 0.66 | Balanced Accuracy: 0.56  
INFO:\_\_main\_\_:Best Balanced Accuracy Seen, validation/test: 0.71 0.74

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!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!counter: 53, score: 0.5581045751633987, best_
score: 0.694640522875817
INFO:__main__:Epoch: 291 | Total Loss: 0.76 | Balanced Accuracy: 0.66
INFO:__main__:Best Balanced Accuracy Seen, validation/test: 0.71 0.74
!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!counter: 54, score: 0.6559477124183006, best_
score: 0.694640522875817
INFO:__main__:Epoch: 292 | Total Loss: 0.61 | Balanced Accuracy: 0.66
INFO:__main__:Best Balanced Accuracy Seen, validation/test: 0.71 0.74
!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!counter: 55, score: 0.6615032679738562, best_
score: 0.694640522875817
INFO:__main__:Epoch: 293 | Total Loss: 0.58 | Balanced Accuracy: 0.60
INFO:__main__:Best Balanced Accuracy Seen, validation/test: 0.71 0.74
!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!counter: 56, score: 0.6041176470588235, best_
score: 0.694640522875817
INFO:__main__:Epoch: 294 | Total Loss: 0.74 | Balanced Accuracy: 0.62
INFO:__main__:Best Balanced Accuracy Seen, validation/test: 0.71 0.74
!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!counter: 57, score: 0.6158169934640524, best_
score: 0.694640522875817
INFO:__main__:Epoch: 295 | Total Loss: 0.61 | Balanced Accuracy: 0.64
INFO:__main__:Best Balanced Accuracy Seen, validation/test: 0.71 0.74
!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!counter: 58, score: 0.6418954248366013, best_
score: 0.694640522875817
INFO:__main__:Epoch: 296 | Total Loss: 0.63 | Balanced Accuracy: 0.57
INFO:__main__:Best Balanced Accuracy Seen, validation/test: 0.71 0.74
!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!counter: 59, score: 0.5703921568627451, best_
score: 0.694640522875817
INFO:__main__:Epoch: 297 | Total Loss: 0.61 | Balanced Accuracy: 0.60
INFO:__main__:Best Balanced Accuracy Seen, validation/test: 0.71 0.74
!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!counter: 60, score: 0.6027450980392157, best_
score: 0.694640522875817
INFO:__main__:Epoch: 298 | Total Loss: 0.66 | Balanced Accuracy: 0.69
INFO:__main__:Best Balanced Accuracy Seen, validation/test: 0.71 0.74
!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!counter: 61, score: 0.6877777777777778, best_
score: 0.694640522875817
INFO:__main__:Epoch: 299 | Total Loss: 0.70 | Balanced Accuracy: 0.55
INFO:__main__:Best Balanced Accuracy Seen, validation/test: 0.71 0.74
!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!counter: 62, score: 0.5545751633986928, best_
score: 0.694640522875817
INFO:__main__:Epoch: 300 | Total Loss: 0.63 | Balanced Accuracy: 0.58
INFO:__main__:Best Balanced Accuracy Seen, validation/test: 0.71 0.74
!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!counter: 63, score: 0.5824183006535949, best_
score: 0.694640522875817
INFO:__main__:Epoch: 301 | Total Loss: 0.57 | Balanced Accuracy: 0.61
INFO:__main__:Best Balanced Accuracy Seen, validation/test: 0.71 0.74
!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!counter: 64, score: 0.6115686274509805, best_
score: 0.694640522875817
INFO:__main__:Epoch: 302 | Total Loss: 0.69 | Balanced Accuracy: 0.61
INFO:__main__:Best Balanced Accuracy Seen, validation/test: 0.71 0.74
!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!counter: 65, score: 0.6083660130718954, best_
score: 0.694640522875817
INFO:__main__:Epoch: 303 | Total Loss: 0.62 | Balanced Accuracy: 0.63
INFO:__main__:Best Balanced Accuracy Seen, validation/test: 0.71 0.74
!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!counter: 66, score: 0.6311764705882353, best_
score: 0.694640522875817
INFO:__main__:Epoch: 304 | Total Loss: 0.91 | Balanced Accuracy: 0.63
INFO:__main__:Best Balanced Accuracy Seen, validation/test: 0.71 0.74
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!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!counter: 67, score: 0.6326797385620915, best\_score: 0.694640522875817  
INFO:\_\_main\_\_:Epoch: 305 | Total Loss: 0.61 | Balanced Accuracy: 0.54  
INFO:\_\_main\_\_:Best Balanced Accuracy Seen, validation/test: 0.71 0.74  
!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!counter: 68, score: 0.5434640522875817, best\_score: 0.694640522875817  
INFO:\_\_main\_\_:Epoch: 306 | Total Loss: 0.62 | Balanced Accuracy: 0.63  
INFO:\_\_main\_\_:Best Balanced Accuracy Seen, validation/test: 0.71 0.74  
!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!counter: 69, score: 0.6281045751633987, best\_score: 0.694640522875817  
INFO:\_\_main\_\_:Epoch: 307 | Total Loss: 0.62 | Balanced Accuracy: 0.63  
INFO:\_\_main\_\_:Best Balanced Accuracy Seen, validation/test: 0.71 0.74  
!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!counter: 70, score: 0.6291503267973857, best\_score: 0.694640522875817  
INFO:\_\_main\_\_:Epoch: 308 | Total Loss: 0.62 | Balanced Accuracy: 0.60  
INFO:\_\_main\_\_:Best Balanced Accuracy Seen, validation/test: 0.71 0.74  
!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!counter: 71, score: 0.6035294117647059, best\_score: 0.694640522875817  
INFO:\_\_main\_\_:Epoch: 309 | Total Loss: 0.65 | Balanced Accuracy: 0.53  
INFO:\_\_main\_\_:Best Balanced Accuracy Seen, validation/test: 0.71 0.74  
!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!counter: 72, score: 0.5321568627450981, best\_score: 0.694640522875817  
INFO:\_\_main\_\_:Epoch: 310 | Total Loss: 0.58 | Balanced Accuracy: 0.59  
INFO:\_\_main\_\_:Best Balanced Accuracy Seen, validation/test: 0.71 0.74  
!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!counter: 73, score: 0.5913725490196079, best\_score: 0.694640522875817  
INFO:\_\_main\_\_:Epoch: 311 | Total Loss: 0.53 | Balanced Accuracy: 0.63  
INFO:\_\_main\_\_:Best Balanced Accuracy Seen, validation/test: 0.71 0.74  
!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!counter: 74, score: 0.628562091503268, best\_score: 0.694640522875817  
INFO:\_\_main\_\_:Epoch: 312 | Total Loss: 0.54 | Balanced Accuracy: 0.63  
INFO:\_\_main\_\_:Best Balanced Accuracy Seen, validation/test: 0.71 0.74  
!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!counter: 75, score: 0.6256209150326798, best\_score: 0.694640522875817  
INFO:\_\_main\_\_:Epoch: 313 | Total Loss: 0.64 | Balanced Accuracy: 0.66  
INFO:\_\_main\_\_:Best Balanced Accuracy Seen, validation/test: 0.71 0.74  
!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!counter: 76, score: 0.6567320261437909, best\_score: 0.694640522875817  
INFO:\_\_main\_\_:Epoch: 314 | Total Loss: 0.59 | Balanced Accuracy: 0.64  
INFO:\_\_main\_\_:Best Balanced Accuracy Seen, validation/test: 0.71 0.74  
!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!counter: 77, score: 0.6370588235294118, best\_score: 0.694640522875817  
INFO:\_\_main\_\_:Epoch: 315 | Total Loss: 0.57 | Balanced Accuracy: 0.68  
INFO:\_\_main\_\_:Best Balanced Accuracy Seen, validation/test: 0.71 0.74  
!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!counter: 78, score: 0.683333333333332, best\_score: 0.694640522875817  
INFO:\_\_main\_\_:Epoch: 316 | Total Loss: 0.59 | Balanced Accuracy: 0.65  
INFO:\_\_main\_\_:Best Balanced Accuracy Seen, validation/test: 0.71 0.74  
!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!counter: 79, score: 0.6498692810457517, best\_score: 0.694640522875817  
INFO:\_\_main\_\_:Epoch: 317 | Total Loss: 0.62 | Balanced Accuracy: 0.68  
INFO:\_\_main\_\_:Best Balanced Accuracy Seen, validation/test: 0.71 0.74  
!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!counter: 80, score: 0.6827450980392156, best\_score: 0.694640522875817  
INFO:\_\_main\_\_:Epoch: 318 | Total Loss: 0.64 | Balanced Accuracy: 0.65  
INFO:\_\_main\_\_:Best Balanced Accuracy Seen, validation/test: 0.71 0.74

!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!counter: 81, score: 0.646797385620915, best\_s  
core: 0.694640522875817  
INFO:\_\_main\_\_:Epoch: 319 | Total Loss: 0.64 | Balanced Accuracy: 0.65  
INFO:\_\_main\_\_:Best Balanced Accuracy Seen, validation/test: 0.71 0.74  
!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!counter: 82, score: 0.6464705882352941, best\_  
score: 0.694640522875817  
INFO:\_\_main\_\_:Epoch: 320 | Total Loss: 0.59 | Balanced Accuracy: 0.63  
INFO:\_\_main\_\_:Best Balanced Accuracy Seen, validation/test: 0.71 0.74  
!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!counter: 83, score: 0.6282352941176471, best\_  
score: 0.694640522875817  
INFO:\_\_main\_\_:Epoch: 321 | Total Loss: 0.57 | Balanced Accuracy: 0.60  
INFO:\_\_main\_\_:Best Balanced Accuracy Seen, validation/test: 0.71 0.74  
!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!counter: 84, score: 0.6042483660130719, best\_  
score: 0.694640522875817  
INFO:\_\_main\_\_:Epoch: 322 | Total Loss: 0.65 | Balanced Accuracy: 0.61  
INFO:\_\_main\_\_:Best Balanced Accuracy Seen, validation/test: 0.71 0.74  
!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!counter: 85, score: 0.6141176470588235, best\_  
score: 0.694640522875817  
INFO:\_\_main\_\_:Epoch: 323 | Total Loss: 0.60 | Balanced Accuracy: 0.59  
INFO:\_\_main\_\_:Best Balanced Accuracy Seen, validation/test: 0.71 0.74  
!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!counter: 86, score: 0.5904575163398693, best\_  
score: 0.694640522875817  
INFO:\_\_main\_\_:Epoch: 324 | Total Loss: 0.69 | Balanced Accuracy: 0.65  
INFO:\_\_main\_\_:Best Balanced Accuracy Seen, validation/test: 0.71 0.74  
!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!counter: 87, score: 0.6525490196078432, best\_  
score: 0.694640522875817  
INFO:\_\_main\_\_:Epoch: 325 | Total Loss: 0.60 | Balanced Accuracy: 0.64  
INFO:\_\_main\_\_:Best Balanced Accuracy Seen, validation/test: 0.71 0.74  
!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!counter: 88, score: 0.64, best\_score: 0.69464  
0522875817  
INFO:\_\_main\_\_:Epoch: 326 | Total Loss: 0.55 | Balanced Accuracy: 0.63  
INFO:\_\_main\_\_:Best Balanced Accuracy Seen, validation/test: 0.71 0.74  
!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!counter: 89, score: 0.6254901960784314, best\_  
score: 0.694640522875817  
INFO:\_\_main\_\_:Epoch: 327 | Total Loss: 0.59 | Balanced Accuracy: 0.68  
INFO:\_\_main\_\_:Best Balanced Accuracy Seen, validation/test: 0.71 0.74  
!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!counter: 90, score: 0.6779738562091504, best\_  
score: 0.694640522875817  
INFO:\_\_main\_\_:Epoch: 328 | Total Loss: 0.64 | Balanced Accuracy: 0.64  
INFO:\_\_main\_\_:Best Balanced Accuracy Seen, validation/test: 0.71 0.74  
!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!counter: 91, score: 0.6413071895424837, best\_  
score: 0.694640522875817  
INFO:\_\_main\_\_:Epoch: 329 | Total Loss: 0.61 | Balanced Accuracy: 0.63  
INFO:\_\_main\_\_:Best Balanced Accuracy Seen, validation/test: 0.71 0.74  
!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!counter: 92, score: 0.6335947712418301, best\_  
score: 0.694640522875817  
INFO:\_\_main\_\_:Epoch: 330 | Total Loss: 0.69 | Balanced Accuracy: 0.62  
INFO:\_\_main\_\_:Best Balanced Accuracy Seen, validation/test: 0.71 0.74  
!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!counter: 93, score: 0.6239869281045752, best\_  
score: 0.694640522875817  
INFO:\_\_main\_\_:Epoch: 331 | Total Loss: 0.68 | Balanced Accuracy: 0.65  
INFO:\_\_main\_\_:Best Balanced Accuracy Seen, validation/test: 0.71 0.74  
!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!counter: 94, score: 0.6520261437908497, best\_  
score: 0.694640522875817  
INFO:\_\_main\_\_:Epoch: 332 | Total Loss: 0.70 | Balanced Accuracy: 0.67  
INFO:\_\_main\_\_:Best Balanced Accuracy Seen, validation/test: 0.71 0.74

!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!counter: 95, score: 0.6688235294117647, best\_score: 0.694640522875817  
INFO:\_\_main\_\_:Epoch: 333 | Total Loss: 0.67 | Balanced Accuracy: 0.64  
INFO:\_\_main\_\_:Best Balanced Accuracy Seen, validation/test: 0.71 0.74  
!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!counter: 96, score: 0.6444444444444445, best\_score: 0.694640522875817  
INFO:\_\_main\_\_:Epoch: 334 | Total Loss: 0.64 | Balanced Accuracy: 0.65  
INFO:\_\_main\_\_:Best Balanced Accuracy Seen, validation/test: 0.71 0.74  
!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!counter: 97, score: 0.6490849673202614, best\_score: 0.694640522875817  
INFO:\_\_main\_\_:Epoch: 335 | Total Loss: 0.64 | Balanced Accuracy: 0.59  
INFO:\_\_main\_\_:Best Balanced Accuracy Seen, validation/test: 0.71 0.74  
!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!counter: 98, score: 0.5882352941176471, best\_score: 0.694640522875817  
INFO:\_\_main\_\_:Epoch: 336 | Total Loss: 0.60 | Balanced Accuracy: 0.60  
INFO:\_\_main\_\_:Best Balanced Accuracy Seen, validation/test: 0.71 0.74  
!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!counter: 99, score: 0.603202614379085, best\_score: 0.694640522875817  
INFO:\_\_main\_\_:Epoch: 337 | Total Loss: 0.52 | Balanced Accuracy: 0.64  
INFO:\_\_main\_\_:Best Balanced Accuracy Seen, validation/test: 0.71 0.74  
!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!counter: 100, score: 0.6363398692810458, best\_score: 0.694640522875817  
INFO:\_\_main\_\_:Epoch: 338 | Total Loss: 0.52 | Balanced Accuracy: 0.64  
INFO:\_\_main\_\_:Best Balanced Accuracy Seen, validation/test: 0.71 0.74  
!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!counter: 101, score: 0.6363398692810458, best\_score: 0.694640522875817  
INFO:\_\_main\_\_:Epoch: 339 | Total Loss: 0.59 | Balanced Accuracy: 0.62  
INFO:\_\_main\_\_:Best Balanced Accuracy Seen, validation/test: 0.71 0.74  
!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!counter: 102, score: 0.6233333333333334, best\_score: 0.694640522875817  
INFO:\_\_main\_\_:Epoch: 340 | Total Loss: 0.60 | Balanced Accuracy: 0.51  
INFO:\_\_main\_\_:Best Balanced Accuracy Seen, validation/test: 0.71 0.74  
!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!counter: 103, score: 0.5136601307189542, best\_score: 0.694640522875817  
INFO:\_\_main\_\_:Epoch: 341 | Total Loss: 0.66 | Balanced Accuracy: 0.62  
INFO:\_\_main\_\_:Best Balanced Accuracy Seen, validation/test: 0.71 0.74  
!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!counter: 104, score: 0.6172549019607844, best\_score: 0.694640522875817  
INFO:\_\_main\_\_:Epoch: 342 | Total Loss: 0.58 | Balanced Accuracy: 0.60  
INFO:\_\_main\_\_:Best Balanced Accuracy Seen, validation/test: 0.71 0.74  
!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!counter: 105, score: 0.6040522875816993, best\_score: 0.694640522875817  
INFO:\_\_main\_\_:Epoch: 343 | Total Loss: 0.63 | Balanced Accuracy: 0.63  
INFO:\_\_main\_\_:Best Balanced Accuracy Seen, validation/test: 0.71 0.74  
!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!counter: 106, score: 0.6262091503267974, best\_score: 0.694640522875817  
INFO:\_\_main\_\_:Epoch: 344 | Total Loss: 0.64 | Balanced Accuracy: 0.54  
INFO:\_\_main\_\_:Best Balanced Accuracy Seen, validation/test: 0.71 0.74  
!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!counter: 107, score: 0.5406535947712419, best\_score: 0.694640522875817  
INFO:\_\_main\_\_:Epoch: 345 | Total Loss: 0.58 | Balanced Accuracy: 0.61  
INFO:\_\_main\_\_:Best Balanced Accuracy Seen, validation/test: 0.71 0.74  
!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!counter: 108, score: 0.6115032679738562, best\_score: 0.694640522875817  
INFO:\_\_main\_\_:Epoch: 346 | Total Loss: 0.65 | Balanced Accuracy: 0.59  
INFO:\_\_main\_\_:Best Balanced Accuracy Seen, validation/test: 0.71 0.74

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!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!counter: 109, score: 0.5877777777777777, best
_score: 0.694640522875817
INFO:__main__:Epoch: 347 | Total Loss: 0.54 | Balanced Accuracy: 0.57
INFO:__main__:Best Balanced Accuracy Seen, validation/test: 0.71 0.74
!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!counter: 110, score: 0.5715032679738562, best
_score: 0.694640522875817
INFO:__main__:Epoch: 348 | Total Loss: 0.58 | Balanced Accuracy: 0.61
INFO:__main__:Best Balanced Accuracy Seen, validation/test: 0.71 0.74
!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!counter: 111, score: 0.6079084967320262, best
_score: 0.694640522875817
INFO:__main__:Epoch: 349 | Total Loss: 0.69 | Balanced Accuracy: 0.62
INFO:__main__:Best Balanced Accuracy Seen, validation/test: 0.71 0.74
!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!counter: 112, score: 0.6173856209150327, best
_score: 0.694640522875817
INFO:__main__:Epoch: 350 | Total Loss: 0.55 | Balanced Accuracy: 0.60
INFO:__main__:Best Balanced Accuracy Seen, validation/test: 0.71 0.74
!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!counter: 113, score: 0.6011764705882353, best
_score: 0.694640522875817
INFO:__main__:Epoch: 351 | Total Loss: 0.60 | Balanced Accuracy: 0.67
INFO:__main__:Best Balanced Accuracy Seen, validation/test: 0.71 0.74
!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!counter: 114, score: 0.666078431372549, best_
score: 0.694640522875817
INFO:__main__:Epoch: 352 | Total Loss: 0.55 | Balanced Accuracy: 0.68
INFO:__main__:Best Balanced Accuracy Seen, validation/test: 0.71 0.74
!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!counter: 115, score: 0.6807189542483659, best
_score: 0.694640522875817
INFO:__main__:Epoch: 353 | Total Loss: 0.59 | Balanced Accuracy: 0.62
INFO:__main__:Best Balanced Accuracy Seen, validation/test: 0.71 0.74
!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!counter: 116, score: 0.6167320261437909, best
_score: 0.694640522875817
INFO:__main__:Epoch: 354 | Total Loss: 0.61 | Balanced Accuracy: 0.61
INFO:__main__:Best Balanced Accuracy Seen, validation/test: 0.71 0.74
!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!counter: 117, score: 0.608954248366013, best_
score: 0.694640522875817
INFO:__main__:Epoch: 355 | Total Loss: 0.60 | Balanced Accuracy: 0.68
INFO:__main__:Best Balanced Accuracy Seen, validation/test: 0.71 0.74
!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!counter: 118, score: 0.6766666666666666, best
_score: 0.694640522875817
INFO:__main__:Epoch: 356 | Total Loss: 0.58 | Balanced Accuracy: 0.67
INFO:__main__:Best Balanced Accuracy Seen, validation/test: 0.71 0.74
!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!counter: 119, score: 0.6652287581699347, best
_score: 0.694640522875817
INFO:__main__:Epoch: 357 | Total Loss: 0.62 | Balanced Accuracy: 0.67
INFO:__main__:Best Balanced Accuracy Seen, validation/test: 0.71 0.74
!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!counter: 120, score: 0.6707843137254902, best
_score: 0.694640522875817
INFO:__main__:Epoch: 358 | Total Loss: 0.57 | Balanced Accuracy: 0.65
INFO:__main__:Best Balanced Accuracy Seen, validation/test: 0.71 0.74
!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!counter: 121, score: 0.6496732026143791, best
_score: 0.694640522875817
INFO:__main__:Epoch: 359 | Total Loss: 0.52 | Balanced Accuracy: 0.65
INFO:__main__:Best Balanced Accuracy Seen, validation/test: 0.71 0.74
!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!counter: 122, score: 0.6518300653594772, best
_score: 0.694640522875817
INFO:__main__:Epoch: 360 | Total Loss: 0.62 | Balanced Accuracy: 0.65
INFO:__main__:Best Balanced Accuracy Seen, validation/test: 0.71 0.74
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!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!counter: 123, score: 0.6518954248366012, best
_score: 0.694640522875817
INFO:__main__:Epoch: 361 | Total Loss: 0.63 | Balanced Accuracy: 0.66
INFO:__main__:Best Balanced Accuracy Seen, validation/test: 0.71 0.74
!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!counter: 124, score: 0.6628758169934641, best
_score: 0.694640522875817
INFO:__main__:Epoch: 362 | Total Loss: 0.71 | Balanced Accuracy: 0.66
INFO:__main__:Best Balanced Accuracy Seen, validation/test: 0.71 0.74
!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!counter: 125, score: 0.6573202614379084, best
_score: 0.694640522875817
INFO:__main__:Epoch: 363 | Total Loss: 0.64 | Balanced Accuracy: 0.64
INFO:__main__:Best Balanced Accuracy Seen, validation/test: 0.71 0.74
!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!counter: 126, score: 0.6429411764705882, best
_score: 0.694640522875817
INFO:__main__:Epoch: 364 | Total Loss: 0.65 | Balanced Accuracy: 0.60
INFO:__main__:Best Balanced Accuracy Seen, validation/test: 0.71 0.74
!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!counter: 127, score: 0.6028104575163399, best
_score: 0.694640522875817
INFO:__main__:Epoch: 365 | Total Loss: 0.85 | Balanced Accuracy: 0.66
INFO:__main__:Best Balanced Accuracy Seen, validation/test: 0.71 0.74
!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!counter: 128, score: 0.6647712418300654, best
_score: 0.694640522875817
INFO:__main__:Epoch: 366 | Total Loss: 0.63 | Balanced Accuracy: 0.67
INFO:__main__:Best Balanced Accuracy Seen, validation/test: 0.71 0.74
!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!counter: 129, score: 0.6711111111111111, best
_score: 0.694640522875817
INFO:__main__:Epoch: 367 | Total Loss: 0.58 | Balanced Accuracy: 0.63
INFO:__main__:Best Balanced Accuracy Seen, validation/test: 0.71 0.74
!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!counter: 130, score: 0.62640522875817, best_s
core: 0.694640522875817
INFO:__main__:Epoch: 368 | Total Loss: 0.61 | Balanced Accuracy: 0.69
INFO:__main__:Best Balanced Accuracy Seen, validation/test: 0.71 0.74
!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!counter: 131, score: 0.6855555555555556, best
_score: 0.694640522875817
INFO:__main__:Epoch: 369 | Total Loss: 0.60 | Balanced Accuracy: 0.67
INFO:__main__:Best Balanced Accuracy Seen, validation/test: 0.71 0.74
!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!counter: 132, score: 0.6743137254901961, best
_score: 0.694640522875817
INFO:__main__:Epoch: 370 | Total Loss: 0.76 | Balanced Accuracy: 0.72
INFO:__main__:Best Balanced Accuracy Seen, validation/test: 0.72 0.74
!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!counter: 0, score: 0.7188235294117648, best_s
core: 0.7188235294117648
INFO:__main__:Epoch: 371 | Total Loss: 0.58 | Balanced Accuracy: 0.69
INFO:__main__:Best Balanced Accuracy Seen, validation/test: 0.72 0.74
!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!counter: 1, score: 0.6854248366013072, best_s
core: 0.7188235294117648
INFO:__main__:Epoch: 372 | Total Loss: 0.54 | Balanced Accuracy: 0.63
INFO:__main__:Best Balanced Accuracy Seen, validation/test: 0.72 0.74
!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!counter: 2, score: 0.6343137254901962, best_s
core: 0.7188235294117648
INFO:__main__:Epoch: 373 | Total Loss: 0.66 | Balanced Accuracy: 0.66
INFO:__main__:Best Balanced Accuracy Seen, validation/test: 0.72 0.74
!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!counter: 3, score: 0.6552287581699346, best_s
core: 0.7188235294117648
INFO:__main__:Epoch: 374 | Total Loss: 0.60 | Balanced Accuracy: 0.68
INFO:__main__:Best Balanced Accuracy Seen, validation/test: 0.72 0.74
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!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!counter: 4, score: 0.6818954248366013, best_s
core: 0.7188235294117648
INFO:__main__:Epoch: 375 | Total Loss: 0.54 | Balanced Accuracy: 0.68
INFO:__main__:Best Balanced Accuracy Seen, validation/test: 0.72 0.74
!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!counter: 5, score: 0.6798039215686275, best_s
core: 0.7188235294117648
INFO:__main__:Epoch: 376 | Total Loss: 0.59 | Balanced Accuracy: 0.65
INFO:__main__:Best Balanced Accuracy Seen, validation/test: 0.72 0.74
!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!counter: 6, score: 0.6530065359477124, best_s
core: 0.7188235294117648
INFO:__main__:Epoch: 377 | Total Loss: 0.64 | Balanced Accuracy: 0.64
INFO:__main__:Best Balanced Accuracy Seen, validation/test: 0.72 0.74
!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!counter: 7, score: 0.6434640522875817, best_s
core: 0.7188235294117648
INFO:__main__:Epoch: 378 | Total Loss: 0.83 | Balanced Accuracy: 0.68
INFO:__main__:Best Balanced Accuracy Seen, validation/test: 0.72 0.74
!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!counter: 8, score: 0.6847712418300653, best_s
core: 0.7188235294117648
INFO:__main__:Epoch: 379 | Total Loss: 0.69 | Balanced Accuracy: 0.71
INFO:__main__:Best Balanced Accuracy Seen, validation/test: 0.72 0.74
!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!counter: 9, score: 0.7145751633986928, best_s
core: 0.7188235294117648
INFO:__main__:Epoch: 380 | Total Loss: 0.67 | Balanced Accuracy: 0.63
INFO:__main__:Best Balanced Accuracy Seen, validation/test: 0.72 0.74
!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!counter: 10, score: 0.6289542483660131, best_
score: 0.7188235294117648
INFO:__main__:Epoch: 381 | Total Loss: 0.63 | Balanced Accuracy: 0.55
INFO:__main__:Best Balanced Accuracy Seen, validation/test: 0.72 0.74
!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!counter: 11, score: 0.5453594771241831, best_
score: 0.7188235294117648
INFO:__main__:Epoch: 382 | Total Loss: 0.68 | Balanced Accuracy: 0.63
INFO:__main__:Best Balanced Accuracy Seen, validation/test: 0.72 0.74
!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!counter: 12, score: 0.6304575163398692, best_
score: 0.7188235294117648
INFO:__main__:Epoch: 383 | Total Loss: 0.56 | Balanced Accuracy: 0.60
INFO:__main__:Best Balanced Accuracy Seen, validation/test: 0.72 0.74
!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!counter: 13, score: 0.603202614379085, best_s
core: 0.7188235294117648
INFO:__main__:Epoch: 384 | Total Loss: 0.59 | Balanced Accuracy: 0.64
INFO:__main__:Best Balanced Accuracy Seen, validation/test: 0.72 0.74
!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!counter: 14, score: 0.6384313725490196, best_
score: 0.7188235294117648
INFO:__main__:Epoch: 385 | Total Loss: 0.64 | Balanced Accuracy: 0.62
INFO:__main__:Best Balanced Accuracy Seen, validation/test: 0.72 0.74
!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!counter: 15, score: 0.6167973856209151, best_
score: 0.7188235294117648
INFO:__main__:Epoch: 386 | Total Loss: 0.59 | Balanced Accuracy: 0.63
INFO:__main__:Best Balanced Accuracy Seen, validation/test: 0.72 0.74
!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!counter: 16, score: 0.6291503267973857, best_
score: 0.7188235294117648
INFO:__main__:Epoch: 387 | Total Loss: 0.60 | Balanced Accuracy: 0.62
INFO:__main__:Best Balanced Accuracy Seen, validation/test: 0.72 0.74
!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!counter: 17, score: 0.6213725490196079, best_
score: 0.7188235294117648
INFO:__main__:Epoch: 388 | Total Loss: 0.66 | Balanced Accuracy: 0.57
INFO:__main__:Best Balanced Accuracy Seen, validation/test: 0.72 0.74
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!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!counter: 18, score: 0.5715686274509805, best_
score: 0.7188235294117648
INFO:__main__:Epoch: 389 | Total Loss: 0.74 | Balanced Accuracy: 0.59
INFO:__main__:Best Balanced Accuracy Seen, validation/test: 0.72 0.74
!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!counter: 19, score: 0.5869281045751634, best_
score: 0.7188235294117648
INFO:__main__:Epoch: 390 | Total Loss: 0.63 | Balanced Accuracy: 0.61
INFO:__main__:Best Balanced Accuracy Seen, validation/test: 0.72 0.74
!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!counter: 20, score: 0.6061437908496732, best_
score: 0.7188235294117648
INFO:__main__:Epoch: 391 | Total Loss: 0.53 | Balanced Accuracy: 0.69
INFO:__main__:Best Balanced Accuracy Seen, validation/test: 0.72 0.74
!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!counter: 21, score: 0.690718954248366, best_s
core: 0.7188235294117648
INFO:__main__:Epoch: 392 | Total Loss: 0.59 | Balanced Accuracy: 0.70
INFO:__main__:Best Balanced Accuracy Seen, validation/test: 0.72 0.74
!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!counter: 22, score: 0.7018300653594771, best_
score: 0.7188235294117648
INFO:__main__:Epoch: 393 | Total Loss: 0.61 | Balanced Accuracy: 0.67
INFO:__main__:Best Balanced Accuracy Seen, validation/test: 0.72 0.74
!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!counter: 23, score: 0.6729411764705882, best_
score: 0.7188235294117648
INFO:__main__:Epoch: 394 | Total Loss: 0.63 | Balanced Accuracy: 0.62
INFO:__main__:Best Balanced Accuracy Seen, validation/test: 0.72 0.74
!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!counter: 24, score: 0.6172549019607844, best_
score: 0.7188235294117648
INFO:__main__:Epoch: 395 | Total Loss: 0.64 | Balanced Accuracy: 0.66
INFO:__main__:Best Balanced Accuracy Seen, validation/test: 0.72 0.74
!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!counter: 25, score: 0.6574509803921568, best_
score: 0.7188235294117648
INFO:__main__:Epoch: 396 | Total Loss: 0.61 | Balanced Accuracy: 0.58
INFO:__main__:Best Balanced Accuracy Seen, validation/test: 0.72 0.74
!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!counter: 26, score: 0.5765359477124183, best_
score: 0.7188235294117648
INFO:__main__:Epoch: 397 | Total Loss: 0.58 | Balanced Accuracy: 0.63
INFO:__main__:Best Balanced Accuracy Seen, validation/test: 0.72 0.74
!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!counter: 27, score: 0.6315686274509804, best_
score: 0.7188235294117648
INFO:__main__:Epoch: 398 | Total Loss: 0.67 | Balanced Accuracy: 0.65
INFO:__main__:Best Balanced Accuracy Seen, validation/test: 0.72 0.74
!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!counter: 28, score: 0.6544444444444445, best_
score: 0.7188235294117648
INFO:__main__:Epoch: 399 | Total Loss: 0.70 | Balanced Accuracy: 0.57
INFO:__main__:Best Balanced Accuracy Seen, validation/test: 0.72 0.74
!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!counter: 29, score: 0.5654901960784314, best_
score: 0.7188235294117648
INFO:__main__:Epoch: 400 | Total Loss: 0.63 | Balanced Accuracy: 0.57
INFO:__main__:Best Balanced Accuracy Seen, validation/test: 0.72 0.74
!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!counter: 30, score: 0.569673202614379, best_s
core: 0.7188235294117648
INFO:__main__:Epoch: 401 | Total Loss: 0.64 | Balanced Accuracy: 0.57
INFO:__main__:Best Balanced Accuracy Seen, validation/test: 0.72 0.74
!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!counter: 31, score: 0.5737908496732026, best_
score: 0.7188235294117648
INFO:__main__:Epoch: 402 | Total Loss: 0.60 | Balanced Accuracy: 0.60
INFO:__main__:Best Balanced Accuracy Seen, validation/test: 0.72 0.74
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!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!counter: 32, score: 0.6007189542483661, best_
score: 0.7188235294117648
INFO:__main__:Epoch: 403 | Total Loss: 0.63 | Balanced Accuracy: 0.62
INFO:__main__:Best Balanced Accuracy Seen, validation/test: 0.72 0.74
!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!counter: 33, score: 0.6194771241830065, best_
score: 0.7188235294117648
INFO:__main__:Epoch: 404 | Total Loss: 0.54 | Balanced Accuracy: 0.70
INFO:__main__:Best Balanced Accuracy Seen, validation/test: 0.72 0.74
!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!counter: 34, score: 0.7023529411764707, best_
score: 0.7188235294117648
INFO:__main__:Epoch: 405 | Total Loss: 0.67 | Balanced Accuracy: 0.61
INFO:__main__:Best Balanced Accuracy Seen, validation/test: 0.72 0.74
!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!counter: 35, score: 0.6132026143790851, best_
score: 0.7188235294117648
INFO:__main__:Epoch: 406 | Total Loss: 0.76 | Balanced Accuracy: 0.56
INFO:__main__:Best Balanced Accuracy Seen, validation/test: 0.72 0.74
!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!counter: 36, score: 0.5575816993464052, best_
score: 0.7188235294117648
INFO:__main__:Epoch: 407 | Total Loss: 0.64 | Balanced Accuracy: 0.58
INFO:__main__:Best Balanced Accuracy Seen, validation/test: 0.72 0.74
!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!counter: 37, score: 0.5849019607843138, best_
score: 0.7188235294117648
INFO:__main__:Epoch: 408 | Total Loss: 0.67 | Balanced Accuracy: 0.62
INFO:__main__:Best Balanced Accuracy Seen, validation/test: 0.72 0.74
!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!counter: 38, score: 0.6220915032679738, best_
score: 0.7188235294117648
INFO:__main__:Epoch: 409 | Total Loss: 0.66 | Balanced Accuracy: 0.61
INFO:__main__:Best Balanced Accuracy Seen, validation/test: 0.72 0.74
!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!counter: 39, score: 0.6051633986928104, best_
score: 0.7188235294117648
INFO:__main__:Epoch: 410 | Total Loss: 0.76 | Balanced Accuracy: 0.66
INFO:__main__:Best Balanced Accuracy Seen, validation/test: 0.72 0.74
!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!counter: 40, score: 0.6579084967320262, best_
score: 0.7188235294117648
INFO:__main__:Epoch: 411 | Total Loss: 0.59 | Balanced Accuracy: 0.66
INFO:__main__:Best Balanced Accuracy Seen, validation/test: 0.72 0.74
!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!counter: 41, score: 0.6640522875816993, best_
score: 0.7188235294117648
INFO:__main__:Epoch: 412 | Total Loss: 0.64 | Balanced Accuracy: 0.68
INFO:__main__:Best Balanced Accuracy Seen, validation/test: 0.72 0.74
!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!counter: 42, score: 0.6829411764705883, best_
score: 0.7188235294117648
INFO:__main__:Epoch: 413 | Total Loss: 0.67 | Balanced Accuracy: 0.63
INFO:__main__:Best Balanced Accuracy Seen, validation/test: 0.72 0.74
!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!counter: 43, score: 0.6305882352941177, best_
score: 0.7188235294117648
INFO:__main__:Epoch: 414 | Total Loss: 0.60 | Balanced Accuracy: 0.69
INFO:__main__:Best Balanced Accuracy Seen, validation/test: 0.72 0.74
!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!counter: 44, score: 0.6868627450980392, best_
score: 0.7188235294117648
INFO:__main__:Epoch: 415 | Total Loss: 0.54 | Balanced Accuracy: 0.58
INFO:__main__:Best Balanced Accuracy Seen, validation/test: 0.72 0.74
!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!counter: 45, score: 0.5826797385620915, best_
score: 0.7188235294117648
INFO:__main__:Epoch: 416 | Total Loss: 0.60 | Balanced Accuracy: 0.64
INFO:__main__:Best Balanced Accuracy Seen, validation/test: 0.72 0.74
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!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!counter: 46, score: 0.6418954248366013, best_
score: 0.7188235294117648
INFO:__main__:Epoch: 417 | Total Loss: 0.56 | Balanced Accuracy: 0.66
INFO:__main__:Best Balanced Accuracy Seen, validation/test: 0.72 0.74
!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!counter: 47, score: 0.6600653594771242, best_
score: 0.7188235294117648
INFO:__main__:Epoch: 418 | Total Loss: 0.64 | Balanced Accuracy: 0.65
INFO:__main__:Best Balanced Accuracy Seen, validation/test: 0.72 0.74
!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!counter: 48, score: 0.645751633986928, best_s
core: 0.7188235294117648
INFO:__main__:Epoch: 419 | Total Loss: 0.61 | Balanced Accuracy: 0.65
INFO:__main__:Best Balanced Accuracy Seen, validation/test: 0.72 0.74
!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!counter: 49, score: 0.6468627450980392, best_
score: 0.7188235294117648
INFO:__main__:Epoch: 420 | Total Loss: 0.58 | Balanced Accuracy: 0.61
INFO:__main__:Best Balanced Accuracy Seen, validation/test: 0.72 0.74
!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!counter: 50, score: 0.6067320261437908, best_
score: 0.7188235294117648
INFO:__main__:Epoch: 421 | Total Loss: 0.71 | Balanced Accuracy: 0.68
INFO:__main__:Best Balanced Accuracy Seen, validation/test: 0.72 0.74
!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!counter: 51, score: 0.6816993464052289, best_
score: 0.7188235294117648
INFO:__main__:Epoch: 422 | Total Loss: 0.59 | Balanced Accuracy: 0.65
INFO:__main__:Best Balanced Accuracy Seen, validation/test: 0.72 0.74
!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!counter: 52, score: 0.6543137254901961, best_
score: 0.7188235294117648
INFO:__main__:Epoch: 423 | Total Loss: 0.55 | Balanced Accuracy: 0.67
INFO:__main__:Best Balanced Accuracy Seen, validation/test: 0.72 0.74
!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!counter: 53, score: 0.6650326797385621, best_
score: 0.7188235294117648
INFO:__main__:Epoch: 424 | Total Loss: 0.61 | Balanced Accuracy: 0.64
INFO:__main__:Best Balanced Accuracy Seen, validation/test: 0.72 0.74
!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!counter: 54, score: 0.6375816993464052, best_
score: 0.7188235294117648
INFO:__main__:Epoch: 425 | Total Loss: 0.56 | Balanced Accuracy: 0.67
INFO:__main__:Best Balanced Accuracy Seen, validation/test: 0.72 0.74
!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!counter: 55, score: 0.6692810457516339, best_
score: 0.7188235294117648
INFO:__main__:Epoch: 426 | Total Loss: 0.76 | Balanced Accuracy: 0.62
INFO:__main__:Best Balanced Accuracy Seen, validation/test: 0.72 0.74
!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!counter: 56, score: 0.6206535947712418, best_
score: 0.7188235294117648
INFO:__main__:Epoch: 427 | Total Loss: 0.67 | Balanced Accuracy: 0.65
INFO:__main__:Best Balanced Accuracy Seen, validation/test: 0.72 0.74
!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!counter: 57, score: 0.6494771241830065, best_
score: 0.7188235294117648
INFO:__main__:Epoch: 428 | Total Loss: 0.67 | Balanced Accuracy: 0.58
INFO:__main__:Best Balanced Accuracy Seen, validation/test: 0.72 0.74
!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!counter: 58, score: 0.5786274509803921, best_
score: 0.7188235294117648
INFO:__main__:Epoch: 429 | Total Loss: 0.68 | Balanced Accuracy: 0.61
INFO:__main__:Best Balanced Accuracy Seen, validation/test: 0.72 0.74
!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!counter: 59, score: 0.6087581699346405, best_
score: 0.7188235294117648
INFO:__main__:Epoch: 430 | Total Loss: 0.63 | Balanced Accuracy: 0.60
INFO:__main__:Best Balanced Accuracy Seen, validation/test: 0.72 0.74
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!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!counter: 60, score: 0.5979738562091503, best_
score: 0.7188235294117648
INFO:__main__:Epoch: 431 | Total Loss: 0.64 | Balanced Accuracy: 0.64
INFO:__main__:Best Balanced Accuracy Seen, validation/test: 0.72 0.74
!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!counter: 61, score: 0.640718954248366, best_s
core: 0.7188235294117648
INFO:__main__:Epoch: 432 | Total Loss: 0.59 | Balanced Accuracy: 0.57
INFO:__main__:Best Balanced Accuracy Seen, validation/test: 0.72 0.74
!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!counter: 62, score: 0.5741176470588235, best_
score: 0.7188235294117648
INFO:__main__:Epoch: 433 | Total Loss: 0.66 | Balanced Accuracy: 0.57
INFO:__main__:Best Balanced Accuracy Seen, validation/test: 0.72 0.74
!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!counter: 63, score: 0.5666666666666668, best_
score: 0.7188235294117648
INFO:__main__:Epoch: 434 | Total Loss: 0.68 | Balanced Accuracy: 0.64
INFO:__main__:Best Balanced Accuracy Seen, validation/test: 0.72 0.74
!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!counter: 64, score: 0.6430718954248366, best_
score: 0.7188235294117648
INFO:__main__:Epoch: 435 | Total Loss: 0.56 | Balanced Accuracy: 0.56
INFO:__main__:Best Balanced Accuracy Seen, validation/test: 0.72 0.74
!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!counter: 65, score: 0.5577777777777778, best_
score: 0.7188235294117648
INFO:__main__:Epoch: 436 | Total Loss: 0.65 | Balanced Accuracy: 0.64
INFO:__main__:Best Balanced Accuracy Seen, validation/test: 0.72 0.74
!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!counter: 66, score: 0.6415032679738563, best_
score: 0.7188235294117648
INFO:__main__:Epoch: 437 | Total Loss: 0.58 | Balanced Accuracy: 0.59
INFO:__main__:Best Balanced Accuracy Seen, validation/test: 0.72 0.74
!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!counter: 67, score: 0.5918954248366014, best_
score: 0.7188235294117648
INFO:__main__:Epoch: 438 | Total Loss: 0.61 | Balanced Accuracy: 0.57
INFO:__main__:Best Balanced Accuracy Seen, validation/test: 0.72 0.74
!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!counter: 68, score: 0.5737254901960784, best_
score: 0.7188235294117648
INFO:__main__:Epoch: 439 | Total Loss: 0.58 | Balanced Accuracy: 0.61
INFO:__main__:Best Balanced Accuracy Seen, validation/test: 0.72 0.74
!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!counter: 69, score: 0.6068627450980392, best_
score: 0.7188235294117648
INFO:__main__:Epoch: 440 | Total Loss: 0.64 | Balanced Accuracy: 0.65
INFO:__main__:Best Balanced Accuracy Seen, validation/test: 0.72 0.74
!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!counter: 70, score: 0.6469281045751635, best_
score: 0.7188235294117648
INFO:__main__:Epoch: 441 | Total Loss: 0.65 | Balanced Accuracy: 0.64
INFO:__main__:Best Balanced Accuracy Seen, validation/test: 0.72 0.74
!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!counter: 71, score: 0.6439869281045751, best_
score: 0.7188235294117648
INFO:__main__:Epoch: 442 | Total Loss: 0.66 | Balanced Accuracy: 0.69
INFO:__main__:Best Balanced Accuracy Seen, validation/test: 0.72 0.74
!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!counter: 72, score: 0.6905228758169933, best_
score: 0.7188235294117648
INFO:__main__:Epoch: 443 | Total Loss: 0.61 | Balanced Accuracy: 0.61
INFO:__main__:Best Balanced Accuracy Seen, validation/test: 0.72 0.74
!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!counter: 73, score: 0.6090849673202614, best_
score: 0.7188235294117648
INFO:__main__:Epoch: 444 | Total Loss: 0.57 | Balanced Accuracy: 0.64
INFO:__main__:Best Balanced Accuracy Seen, validation/test: 0.72 0.74
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!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!counter: 74, score: 0.6379738562091503, best_
score: 0.7188235294117648
INFO:__main__:Epoch: 445 | Total Loss: 0.84 | Balanced Accuracy: 0.60
INFO:__main__:Best Balanced Accuracy Seen, validation/test: 0.72 0.74
!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!counter: 75, score: 0.596078431372549, best_s
core: 0.7188235294117648
INFO:__main__:Epoch: 446 | Total Loss: 0.63 | Balanced Accuracy: 0.65
INFO:__main__:Best Balanced Accuracy Seen, validation/test: 0.72 0.74
!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!counter: 76, score: 0.6528104575163399, best_
score: 0.7188235294117648
INFO:__main__:Epoch: 447 | Total Loss: 0.59 | Balanced Accuracy: 0.66
INFO:__main__:Best Balanced Accuracy Seen, validation/test: 0.72 0.74
!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!counter: 77, score: 0.6595424836601308, best_
score: 0.7188235294117648
INFO:__main__:Epoch: 448 | Total Loss: 0.65 | Balanced Accuracy: 0.61
INFO:__main__:Best Balanced Accuracy Seen, validation/test: 0.72 0.74
!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!counter: 78, score: 0.610718954248366, best_s
core: 0.7188235294117648
INFO:__main__:Epoch: 449 | Total Loss: 0.64 | Balanced Accuracy: 0.68
INFO:__main__:Best Balanced Accuracy Seen, validation/test: 0.72 0.74
!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!counter: 79, score: 0.6760784313725491, best_
score: 0.7188235294117648
INFO:__main__:Epoch: 450 | Total Loss: 0.65 | Balanced Accuracy: 0.66
INFO:__main__:Best Balanced Accuracy Seen, validation/test: 0.72 0.74
!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!counter: 80, score: 0.660326797385621, best_s
core: 0.7188235294117648
INFO:__main__:Epoch: 451 | Total Loss: 0.67 | Balanced Accuracy: 0.59
INFO:__main__:Best Balanced Accuracy Seen, validation/test: 0.72 0.74
!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!counter: 81, score: 0.5899346405228759, best_
score: 0.7188235294117648
INFO:__main__:Epoch: 452 | Total Loss: 0.61 | Balanced Accuracy: 0.51
INFO:__main__:Best Balanced Accuracy Seen, validation/test: 0.72 0.74
!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!counter: 82, score: 0.5132679738562093, best_
score: 0.7188235294117648
INFO:__main__:Epoch: 453 | Total Loss: 0.66 | Balanced Accuracy: 0.57
INFO:__main__:Best Balanced Accuracy Seen, validation/test: 0.72 0.74
!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!counter: 83, score: 0.5737254901960784, best_
score: 0.7188235294117648
INFO:__main__:Epoch: 454 | Total Loss: 0.65 | Balanced Accuracy: 0.59
INFO:__main__:Best Balanced Accuracy Seen, validation/test: 0.72 0.74
!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!counter: 84, score: 0.5937254901960783, best_
score: 0.7188235294117648
INFO:__main__:Epoch: 455 | Total Loss: 0.67 | Balanced Accuracy: 0.45
INFO:__main__:Best Balanced Accuracy Seen, validation/test: 0.72 0.74
!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!counter: 85, score: 0.4461437908496732, best_
score: 0.7188235294117648
INFO:__main__:Epoch: 456 | Total Loss: 0.71 | Balanced Accuracy: 0.61
INFO:__main__:Best Balanced Accuracy Seen, validation/test: 0.72 0.74
!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!counter: 86, score: 0.6081699346405228, best_
score: 0.7188235294117648
INFO:__main__:Epoch: 457 | Total Loss: 0.60 | Balanced Accuracy: 0.68
INFO:__main__:Best Balanced Accuracy Seen, validation/test: 0.72 0.74
!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!counter: 87, score: 0.677516339869281, best_s
core: 0.7188235294117648
INFO:__main__:Epoch: 458 | Total Loss: 0.67 | Balanced Accuracy: 0.55
INFO:__main__:Best Balanced Accuracy Seen, validation/test: 0.72 0.74
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!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!counter: 88, score: 0.5506535947712418, best_
score: 0.7188235294117648
INFO:__main__:Epoch: 459 | Total Loss: 0.67 | Balanced Accuracy: 0.68
INFO:__main__:Best Balanced Accuracy Seen, validation/test: 0.72 0.74
!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!counter: 89, score: 0.677843137254902, best_s
core: 0.7188235294117648
INFO:__main__:Epoch: 460 | Total Loss: 0.67 | Balanced Accuracy: 0.59
INFO:__main__:Best Balanced Accuracy Seen, validation/test: 0.72 0.74
!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!counter: 90, score: 0.5902614379084967, best_
score: 0.7188235294117648
INFO:__main__:Epoch: 461 | Total Loss: 0.65 | Balanced Accuracy: 0.66
INFO:__main__:Best Balanced Accuracy Seen, validation/test: 0.72 0.74
!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!counter: 91, score: 0.6550326797385622, best_
score: 0.7188235294117648
INFO:__main__:Epoch: 462 | Total Loss: 0.65 | Balanced Accuracy: 0.64
INFO:__main__:Best Balanced Accuracy Seen, validation/test: 0.72 0.74
!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!counter: 92, score: 0.6362091503267974, best_
score: 0.7188235294117648
INFO:__main__:Epoch: 463 | Total Loss: 0.69 | Balanced Accuracy: 0.65
INFO:__main__:Best Balanced Accuracy Seen, validation/test: 0.72 0.74
!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!counter: 93, score: 0.649607843137255, best_s
core: 0.7188235294117648
INFO:__main__:Epoch: 464 | Total Loss: 0.66 | Balanced Accuracy: 0.66
INFO:__main__:Best Balanced Accuracy Seen, validation/test: 0.72 0.74
!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!counter: 94, score: 0.6559477124183006, best_
score: 0.7188235294117648
INFO:__main__:Epoch: 465 | Total Loss: 0.61 | Balanced Accuracy: 0.64
INFO:__main__:Best Balanced Accuracy Seen, validation/test: 0.72 0.74
!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!counter: 95, score: 0.6358823529411765, best_
score: 0.7188235294117648
INFO:__main__:Epoch: 466 | Total Loss: 0.76 | Balanced Accuracy: 0.64
INFO:__main__:Best Balanced Accuracy Seen, validation/test: 0.72 0.74
!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!counter: 96, score: 0.6396732026143791, best_
score: 0.7188235294117648
INFO:__main__:Epoch: 467 | Total Loss: 0.74 | Balanced Accuracy: 0.66
INFO:__main__:Best Balanced Accuracy Seen, validation/test: 0.72 0.74
!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!counter: 97, score: 0.6550326797385622, best_
score: 0.7188235294117648
INFO:__main__:Epoch: 468 | Total Loss: 0.77 | Balanced Accuracy: 0.70
INFO:__main__:Best Balanced Accuracy Seen, validation/test: 0.72 0.74
!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!counter: 98, score: 0.699281045751634, best_s
core: 0.7188235294117648
INFO:__main__:Epoch: 469 | Total Loss: 0.76 | Balanced Accuracy: 0.65
INFO:__main__:Best Balanced Accuracy Seen, validation/test: 0.72 0.74
!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!counter: 99, score: 0.6535294117647058, best_
score: 0.7188235294117648
INFO:__main__:Epoch: 470 | Total Loss: 0.71 | Balanced Accuracy: 0.67
INFO:__main__:Best Balanced Accuracy Seen, validation/test: 0.72 0.74
!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!counter: 100, score: 0.6711111111111111, best
_score: 0.7188235294117648
INFO:__main__:Epoch: 471 | Total Loss: 0.67 | Balanced Accuracy: 0.68
INFO:__main__:Best Balanced Accuracy Seen, validation/test: 0.72 0.74
!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!counter: 101, score: 0.6763398692810457, best
_score: 0.7188235294117648
INFO:__main__:Epoch: 472 | Total Loss: 0.67 | Balanced Accuracy: 0.65
INFO:__main__:Best Balanced Accuracy Seen, validation/test: 0.72 0.74
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!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!counter: 102, score: 0.6530065359477124, best
_score: 0.7188235294117648
INFO:__main__:Epoch: 473 | Total Loss: 0.62 | Balanced Accuracy: 0.65
INFO:__main__:Best Balanced Accuracy Seen, validation/test: 0.72 0.74
!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!counter: 103, score: 0.6535294117647058, best
_score: 0.7188235294117648
INFO:__main__:Epoch: 474 | Total Loss: 0.64 | Balanced Accuracy: 0.61
INFO:__main__:Best Balanced Accuracy Seen, validation/test: 0.72 0.74
!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!counter: 104, score: 0.6128104575163399, best
_score: 0.7188235294117648
INFO:__main__:Epoch: 475 | Total Loss: 0.63 | Balanced Accuracy: 0.69
INFO:__main__:Best Balanced Accuracy Seen, validation/test: 0.72 0.74
!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!counter: 105, score: 0.6879738562091503, best
_score: 0.7188235294117648
INFO:__main__:Epoch: 476 | Total Loss: 0.61 | Balanced Accuracy: 0.69
INFO:__main__:Best Balanced Accuracy Seen, validation/test: 0.72 0.74
!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!counter: 106, score: 0.6866666666666666, best
_score: 0.7188235294117648
INFO:__main__:Epoch: 477 | Total Loss: 0.57 | Balanced Accuracy: 0.71
INFO:__main__:Best Balanced Accuracy Seen, validation/test: 0.72 0.74
!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!counter: 107, score: 0.7113071895424836, best
_score: 0.7188235294117648
INFO:__main__:Epoch: 478 | Total Loss: 0.59 | Balanced Accuracy: 0.61
INFO:__main__:Best Balanced Accuracy Seen, validation/test: 0.72 0.74
!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!counter: 108, score: 0.6124183006535948, best
_score: 0.7188235294117648
INFO:__main__:Epoch: 479 | Total Loss: 0.54 | Balanced Accuracy: 0.67
INFO:__main__:Best Balanced Accuracy Seen, validation/test: 0.72 0.74
!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!counter: 109, score: 0.6720261437908497, best
_score: 0.7188235294117648
INFO:__main__:Epoch: 480 | Total Loss: 0.76 | Balanced Accuracy: 0.63
INFO:__main__:Best Balanced Accuracy Seen, validation/test: 0.72 0.74
!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!counter: 110, score: 0.6256209150326797, best
_score: 0.7188235294117648
INFO:__main__:Epoch: 481 | Total Loss: 0.63 | Balanced Accuracy: 0.64
INFO:__main__:Best Balanced Accuracy Seen, validation/test: 0.72 0.74
!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!counter: 111, score: 0.6369934640522876, best
_score: 0.7188235294117648
INFO:__main__:Epoch: 482 | Total Loss: 0.64 | Balanced Accuracy: 0.62
INFO:__main__:Best Balanced Accuracy Seen, validation/test: 0.72 0.74
!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!counter: 112, score: 0.6220261437908498, best
_score: 0.7188235294117648
INFO:__main__:Epoch: 483 | Total Loss: 0.55 | Balanced Accuracy: 0.63
INFO:__main__:Best Balanced Accuracy Seen, validation/test: 0.72 0.74
!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!counter: 113, score: 0.6319607843137255, best
_score: 0.7188235294117648
INFO:__main__:Epoch: 484 | Total Loss: 0.57 | Balanced Accuracy: 0.65
INFO:__main__:Best Balanced Accuracy Seen, validation/test: 0.72 0.74
!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!counter: 114, score: 0.6542483660130719, best
_score: 0.7188235294117648
INFO:__main__:Epoch: 485 | Total Loss: 0.64 | Balanced Accuracy: 0.66
INFO:__main__:Best Balanced Accuracy Seen, validation/test: 0.72 0.74
!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!counter: 115, score: 0.6592810457516339, best
_score: 0.7188235294117648
INFO:__main__:Epoch: 486 | Total Loss: 0.60 | Balanced Accuracy: 0.60
INFO:__main__:Best Balanced Accuracy Seen, validation/test: 0.72 0.74
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!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!counter: 116, score: 0.6019607843137255, best \_score: 0.7188235294117648  
INFO:\_\_main\_\_:Epoch: 487 | Total Loss: 0.58 | Balanced Accuracy: 0.66  
INFO:\_\_main\_\_:Best Balanced Accuracy Seen, validation/test: 0.72 0.74  
!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!counter: 117, score: 0.6579738562091503, best \_score: 0.7188235294117648  
INFO:\_\_main\_\_:Epoch: 488 | Total Loss: 0.61 | Balanced Accuracy: 0.70  
INFO:\_\_main\_\_:Best Balanced Accuracy Seen, validation/test: 0.72 0.74  
!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!counter: 118, score: 0.7031372549019608, best \_score: 0.7188235294117648  
INFO:\_\_main\_\_:Epoch: 489 | Total Loss: 0.66 | Balanced Accuracy: 0.67  
INFO:\_\_main\_\_:Best Balanced Accuracy Seen, validation/test: 0.72 0.74  
!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!counter: 119, score: 0.6698039215686276, best \_score: 0.7188235294117648  
INFO:\_\_main\_\_:Epoch: 490 | Total Loss: 0.75 | Balanced Accuracy: 0.69  
INFO:\_\_main\_\_:Best Balanced Accuracy Seen, validation/test: 0.72 0.74  
!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!counter: 120, score: 0.6937254901960784, best \_score: 0.7188235294117648  
INFO:\_\_main\_\_:Epoch: 491 | Total Loss: 0.63 | Balanced Accuracy: 0.64  
INFO:\_\_main\_\_:Best Balanced Accuracy Seen, validation/test: 0.72 0.74  
!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!counter: 121, score: 0.644967320261438, best \_score: 0.7188235294117648  
INFO:\_\_main\_\_:Epoch: 492 | Total Loss: 0.62 | Balanced Accuracy: 0.71  
INFO:\_\_main\_\_:Best Balanced Accuracy Seen, validation/test: 0.72 0.74  
!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!counter: 122, score: 0.7051633986928105, best \_score: 0.7188235294117648  
INFO:\_\_main\_\_:Epoch: 493 | Total Loss: 0.62 | Balanced Accuracy: 0.64  
INFO:\_\_main\_\_:Best Balanced Accuracy Seen, validation/test: 0.72 0.74  
!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!counter: 123, score: 0.6430718954248366, best \_score: 0.7188235294117648  
INFO:\_\_main\_\_:Epoch: 494 | Total Loss: 0.67 | Balanced Accuracy: 0.66  
INFO:\_\_main\_\_:Best Balanced Accuracy Seen, validation/test: 0.72 0.74  
!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!counter: 124, score: 0.6609150326797386, best \_score: 0.7188235294117648  
INFO:\_\_main\_\_:Epoch: 495 | Total Loss: 0.59 | Balanced Accuracy: 0.69  
INFO:\_\_main\_\_:Best Balanced Accuracy Seen, validation/test: 0.72 0.74  
!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!counter: 125, score: 0.6923529411764706, best \_score: 0.7188235294117648  
INFO:\_\_main\_\_:Epoch: 496 | Total Loss: 0.59 | Balanced Accuracy: 0.64  
INFO:\_\_main\_\_:Best Balanced Accuracy Seen, validation/test: 0.72 0.74  
!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!counter: 126, score: 0.6370588235294118, best \_score: 0.7188235294117648  
INFO:\_\_main\_\_:Epoch: 497 | Total Loss: 0.63 | Balanced Accuracy: 0.67  
INFO:\_\_main\_\_:Best Balanced Accuracy Seen, validation/test: 0.72 0.74  
!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!counter: 127, score: 0.6683660130718955, best \_score: 0.7188235294117648  
INFO:\_\_main\_\_:Epoch: 498 | Total Loss: 0.53 | Balanced Accuracy: 0.66  
INFO:\_\_main\_\_:Best Balanced Accuracy Seen, validation/test: 0.72 0.74  
!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!counter: 128, score: 0.6607843137254902, best \_score: 0.7188235294117648  
INFO:\_\_main\_\_:Epoch: 499 | Total Loss: 0.52 | Balanced Accuracy: 0.63  
INFO:\_\_main\_\_:Best Balanced Accuracy Seen, validation/test: 0.72 0.74  
!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!counter: 129, score: 0.6341176470588236, best \_score: 0.7188235294117648  
INFO:\_\_main\_\_:Epoch: 500 | Total Loss: 0.61 | Balanced Accuracy: 0.66  
INFO:\_\_main\_\_:Best Balanced Accuracy Seen, validation/test: 0.72 0.74

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!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!counter: 130, score: 0.6607843137254902, best
_score: 0.7188235294117648
INFO:__main__:Epoch: 501 | Total Loss: 1.07 | Balanced Accuracy: 0.65
INFO:__main__:Best Balanced Accuracy Seen, validation/test: 0.72 0.74
!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!counter: 131, score: 0.6484967320261438, best
_score: 0.7188235294117648
INFO:__main__:Epoch: 502 | Total Loss: 0.79 | Balanced Accuracy: 0.68
INFO:__main__:Best Balanced Accuracy Seen, validation/test: 0.72 0.74
!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!counter: 132, score: 0.6809150326797386, best
_score: 0.7188235294117648
INFO:__main__:Epoch: 503 | Total Loss: 0.68 | Balanced Accuracy: 0.64
INFO:__main__:Best Balanced Accuracy Seen, validation/test: 0.72 0.74
!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!counter: 133, score: 0.6409803921568628, best
_score: 0.7188235294117648
INFO:__main__:Epoch: 504 | Total Loss: 0.62 | Balanced Accuracy: 0.71
INFO:__main__:Best Balanced Accuracy Seen, validation/test: 0.72 0.74
!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!counter: 134, score: 0.714640522875817, best_
score: 0.7188235294117648
INFO:__main__:Epoch: 505 | Total Loss: 0.55 | Balanced Accuracy: 0.74
INFO:__main__:Best Balanced Accuracy Seen, validation/test: 0.74 0.74
!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!counter: 0, score: 0.7360784313725489, best_s
core: 0.7360784313725489
INFO:__main__:Epoch: 506 | Total Loss: 0.56 | Balanced Accuracy: 0.72
INFO:__main__:Best Balanced Accuracy Seen, validation/test: 0.74 0.74
!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!counter: 1, score: 0.7224183006535947, best_s
core: 0.7360784313725489
INFO:__main__:Epoch: 507 | Total Loss: 0.67 | Balanced Accuracy: 0.66
INFO:__main__:Best Balanced Accuracy Seen, validation/test: 0.74 0.74
!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!counter: 2, score: 0.6563398692810457, best_s
core: 0.7360784313725489
INFO:__main__:Epoch: 508 | Total Loss: 0.65 | Balanced Accuracy: 0.63
INFO:__main__:Best Balanced Accuracy Seen, validation/test: 0.74 0.74
!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!counter: 3, score: 0.6256209150326798, best_s
core: 0.7360784313725489
INFO:__main__:Epoch: 509 | Total Loss: 0.64 | Balanced Accuracy: 0.68
INFO:__main__:Best Balanced Accuracy Seen, validation/test: 0.74 0.74
!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!counter: 4, score: 0.6813071895424837, best_s
core: 0.7360784313725489
INFO:__main__:Epoch: 510 | Total Loss: 0.57 | Balanced Accuracy: 0.71
INFO:__main__:Best Balanced Accuracy Seen, validation/test: 0.74 0.74
!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!counter: 5, score: 0.7092156862745099, best_s
core: 0.7360784313725489
INFO:__main__:Epoch: 511 | Total Loss: 0.70 | Balanced Accuracy: 0.69
INFO:__main__:Best Balanced Accuracy Seen, validation/test: 0.74 0.74
!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!counter: 6, score: 0.6944444444444445, best_s
core: 0.7360784313725489
INFO:__main__:Epoch: 512 | Total Loss: 0.64 | Balanced Accuracy: 0.71
INFO:__main__:Best Balanced Accuracy Seen, validation/test: 0.74 0.74
!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!counter: 7, score: 0.7116339869281045, best_s
core: 0.7360784313725489
INFO:__main__:Epoch: 513 | Total Loss: 0.61 | Balanced Accuracy: 0.72
INFO:__main__:Best Balanced Accuracy Seen, validation/test: 0.74 0.74
!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!counter: 8, score: 0.7188888888888888, best_s
core: 0.7360784313725489
INFO:__main__:Epoch: 514 | Total Loss: 0.58 | Balanced Accuracy: 0.72
INFO:__main__:Best Balanced Accuracy Seen, validation/test: 0.74 0.74
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!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!counter: 9, score: 0.7201960784313726, best\_s  
core: 0.7360784313725489

INFO:\_\_main\_\_:Epoch: 515 | Total Loss: 0.63 | Balanced Accuracy: 0.70  
INFO:\_\_main\_\_:Best Balanced Accuracy Seen, validation/test: 0.74 0.74  
!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!counter: 10, score: 0.6986928104575164, best\_  
score: 0.7360784313725489

INFO:\_\_main\_\_:Epoch: 516 | Total Loss: 0.60 | Balanced Accuracy: 0.65  
INFO:\_\_main\_\_:Best Balanced Accuracy Seen, validation/test: 0.74 0.74  
!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!counter: 11, score: 0.6487581699346405, best\_  
score: 0.7360784313725489

INFO:\_\_main\_\_:Epoch: 517 | Total Loss: 0.57 | Balanced Accuracy: 0.68  
INFO:\_\_main\_\_:Best Balanced Accuracy Seen, validation/test: 0.74 0.74  
!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!counter: 12, score: 0.6784967320261438, best\_  
score: 0.7360784313725489

INFO:\_\_main\_\_:Epoch: 518 | Total Loss: 0.70 | Balanced Accuracy: 0.64  
INFO:\_\_main\_\_:Best Balanced Accuracy Seen, validation/test: 0.74 0.74  
!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!counter: 13, score: 0.6384967320261438, best\_  
score: 0.7360784313725489

INFO:\_\_main\_\_:Epoch: 519 | Total Loss: 0.59 | Balanced Accuracy: 0.62  
INFO:\_\_main\_\_:Best Balanced Accuracy Seen, validation/test: 0.74 0.74  
!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!counter: 14, score: 0.6222222222222222, best\_  
score: 0.7360784313725489

INFO:\_\_main\_\_:Epoch: 520 | Total Loss: 0.63 | Balanced Accuracy: 0.68  
INFO:\_\_main\_\_:Best Balanced Accuracy Seen, validation/test: 0.74 0.74  
!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!counter: 15, score: 0.6816993464052289, best\_  
score: 0.7360784313725489

INFO:\_\_main\_\_:Epoch: 521 | Total Loss: 0.58 | Balanced Accuracy: 0.71  
INFO:\_\_main\_\_:Best Balanced Accuracy Seen, validation/test: 0.74 0.74  
!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!counter: 16, score: 0.7105882352941176, best\_  
score: 0.7360784313725489

INFO:\_\_main\_\_:Epoch: 522 | Total Loss: 0.57 | Balanced Accuracy: 0.63  
INFO:\_\_main\_\_:Best Balanced Accuracy Seen, validation/test: 0.74 0.74  
!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!counter: 17, score: 0.6270588235294118, best\_  
score: 0.7360784313725489

INFO:\_\_main\_\_:Epoch: 523 | Total Loss: 0.68 | Balanced Accuracy: 0.61  
INFO:\_\_main\_\_:Best Balanced Accuracy Seen, validation/test: 0.74 0.74  
!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!counter: 18, score: 0.6145098039215686, best\_  
score: 0.7360784313725489

INFO:\_\_main\_\_:Epoch: 524 | Total Loss: 0.58 | Balanced Accuracy: 0.65  
INFO:\_\_main\_\_:Best Balanced Accuracy Seen, validation/test: 0.74 0.74  
!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!counter: 19, score: 0.6547712418300654, best\_  
score: 0.7360784313725489

INFO:\_\_main\_\_:Epoch: 525 | Total Loss: 0.61 | Balanced Accuracy: 0.62  
INFO:\_\_main\_\_:Best Balanced Accuracy Seen, validation/test: 0.74 0.74  
!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!counter: 20, score: 0.6223529411764706, best\_  
score: 0.7360784313725489

INFO:\_\_main\_\_:Epoch: 526 | Total Loss: 0.57 | Balanced Accuracy: 0.60  
INFO:\_\_main\_\_:Best Balanced Accuracy Seen, validation/test: 0.74 0.74  
!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!counter: 21, score: 0.60111111111111, best\_s  
core: 0.7360784313725489

INFO:\_\_main\_\_:Epoch: 527 | Total Loss: 0.56 | Balanced Accuracy: 0.68  
INFO:\_\_main\_\_:Best Balanced Accuracy Seen, validation/test: 0.74 0.74  
!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!counter: 22, score: 0.6761437908496731, best\_  
score: 0.7360784313725489

INFO:\_\_main\_\_:Epoch: 528 | Total Loss: 0.52 | Balanced Accuracy: 0.59  
INFO:\_\_main\_\_:Best Balanced Accuracy Seen, validation/test: 0.74 0.74

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!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!counter: 23, score: 0.5918954248366014, best_
score: 0.7360784313725489
INFO:__main__:Epoch: 529 | Total Loss: 0.59 | Balanced Accuracy: 0.71
INFO:__main__:Best Balanced Accuracy Seen, validation/test: 0.74 0.74
!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!counter: 24, score: 0.7059477124183006, best_
score: 0.7360784313725489
INFO:__main__:Epoch: 530 | Total Loss: 0.61 | Balanced Accuracy: 0.69
INFO:__main__:Best Balanced Accuracy Seen, validation/test: 0.74 0.74
!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!counter: 25, score: 0.6874509803921569, best_
score: 0.7360784313725489
INFO:__main__:Epoch: 531 | Total Loss: 0.59 | Balanced Accuracy: 0.64
INFO:__main__:Best Balanced Accuracy Seen, validation/test: 0.74 0.74
!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!counter: 26, score: 0.6360130718954248, best_
score: 0.7360784313725489
INFO:__main__:Epoch: 532 | Total Loss: 0.56 | Balanced Accuracy: 0.64
INFO:__main__:Best Balanced Accuracy Seen, validation/test: 0.74 0.74
!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!counter: 27, score: 0.6390849673202615, best_
score: 0.7360784313725489
INFO:__main__:Epoch: 533 | Total Loss: 0.55 | Balanced Accuracy: 0.60
INFO:__main__:Best Balanced Accuracy Seen, validation/test: 0.74 0.74
!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!counter: 28, score: 0.6003921568627452, best_
score: 0.7360784313725489
INFO:__main__:Epoch: 534 | Total Loss: 0.57 | Balanced Accuracy: 0.55
INFO:__main__:Best Balanced Accuracy Seen, validation/test: 0.74 0.74
!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!counter: 29, score: 0.5469281045751634, best_
score: 0.7360784313725489
INFO:__main__:Epoch: 535 | Total Loss: 0.60 | Balanced Accuracy: 0.59
INFO:__main__:Best Balanced Accuracy Seen, validation/test: 0.74 0.74
!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!counter: 30, score: 0.5891503267973857, best_
score: 0.7360784313725489
INFO:__main__:Epoch: 536 | Total Loss: 0.71 | Balanced Accuracy: 0.64
INFO:__main__:Best Balanced Accuracy Seen, validation/test: 0.74 0.74
!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!counter: 31, score: 0.6405882352941177, best_
score: 0.7360784313725489
INFO:__main__:Epoch: 537 | Total Loss: 0.59 | Balanced Accuracy: 0.64
INFO:__main__:Best Balanced Accuracy Seen, validation/test: 0.74 0.74
!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!counter: 32, score: 0.6377777777777779, best_
score: 0.7360784313725489
INFO:__main__:Epoch: 538 | Total Loss: 0.59 | Balanced Accuracy: 0.69
INFO:__main__:Best Balanced Accuracy Seen, validation/test: 0.74 0.74
!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!counter: 33, score: 0.6930065359477124, best_
score: 0.7360784313725489
INFO:__main__:Epoch: 539 | Total Loss: 0.64 | Balanced Accuracy: 0.67
INFO:__main__:Best Balanced Accuracy Seen, validation/test: 0.74 0.74
!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!counter: 34, score: 0.6690849673202613, best_
score: 0.7360784313725489
INFO:__main__:Epoch: 540 | Total Loss: 0.72 | Balanced Accuracy: 0.66
INFO:__main__:Best Balanced Accuracy Seen, validation/test: 0.74 0.74
!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!counter: 35, score: 0.6630065359477123, best_
score: 0.7360784313725489
INFO:__main__:Epoch: 541 | Total Loss: 0.56 | Balanced Accuracy: 0.68
INFO:__main__:Best Balanced Accuracy Seen, validation/test: 0.74 0.74
!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!counter: 36, score: 0.683921568627451, best_
score: 0.7360784313725489
INFO:__main__:Epoch: 542 | Total Loss: 0.59 | Balanced Accuracy: 0.67
INFO:__main__:Best Balanced Accuracy Seen, validation/test: 0.74 0.74
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!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!counter: 37, score: 0.6690849673202613, best_
score: 0.7360784313725489
INFO:__main__:Epoch: 543 | Total Loss: 0.66 | Balanced Accuracy: 0.62
INFO:__main__:Best Balanced Accuracy Seen, validation/test: 0.74 0.74
!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!counter: 38, score: 0.6214379084967321, best_
score: 0.7360784313725489
INFO:__main__:Epoch: 544 | Total Loss: 0.57 | Balanced Accuracy: 0.68
INFO:__main__:Best Balanced Accuracy Seen, validation/test: 0.74 0.74
!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!counter: 39, score: 0.6783660130718955, best_
score: 0.7360784313725489
INFO:__main__:Epoch: 545 | Total Loss: 0.71 | Balanced Accuracy: 0.70
INFO:__main__:Best Balanced Accuracy Seen, validation/test: 0.74 0.74
!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!counter: 40, score: 0.7035294117647058, best_
score: 0.7360784313725489
INFO:__main__:Epoch: 546 | Total Loss: 0.63 | Balanced Accuracy: 0.66
INFO:__main__:Best Balanced Accuracy Seen, validation/test: 0.74 0.74
!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!counter: 41, score: 0.6600653594771242, best_
score: 0.7360784313725489
INFO:__main__:Epoch: 547 | Total Loss: 0.60 | Balanced Accuracy: 0.66
INFO:__main__:Best Balanced Accuracy Seen, validation/test: 0.74 0.74
!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!counter: 42, score: 0.6620915032679738, best_
score: 0.7360784313725489
INFO:__main__:Epoch: 548 | Total Loss: 0.68 | Balanced Accuracy: 0.52
INFO:__main__:Best Balanced Accuracy Seen, validation/test: 0.74 0.74
!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!counter: 43, score: 0.5218954248366013, best_
score: 0.7360784313725489
INFO:__main__:Epoch: 549 | Total Loss: 0.68 | Balanced Accuracy: 0.65
INFO:__main__:Best Balanced Accuracy Seen, validation/test: 0.74 0.74
!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!counter: 44, score: 0.6474509803921569, best_
score: 0.7360784313725489
INFO:__main__:Epoch: 550 | Total Loss: 0.61 | Balanced Accuracy: 0.61
INFO:__main__:Best Balanced Accuracy Seen, validation/test: 0.74 0.74
!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!counter: 45, score: 0.614313725490196, best_s
core: 0.7360784313725489
INFO:__main__:Epoch: 551 | Total Loss: 0.55 | Balanced Accuracy: 0.63
INFO:__main__:Best Balanced Accuracy Seen, validation/test: 0.74 0.74
!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!counter: 46, score: 0.6349019607843137, best_
score: 0.7360784313725489
INFO:__main__:Epoch: 552 | Total Loss: 0.59 | Balanced Accuracy: 0.50
INFO:__main__:Best Balanced Accuracy Seen, validation/test: 0.74 0.74
!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!counter: 47, score: 0.497124183006536, best_s
core: 0.7360784313725489
INFO:__main__:Epoch: 553 | Total Loss: 0.60 | Balanced Accuracy: 0.66
INFO:__main__:Best Balanced Accuracy Seen, validation/test: 0.74 0.74
!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!counter: 48, score: 0.657124183006536, best_s
core: 0.7360784313725489
INFO:__main__:Epoch: 554 | Total Loss: 0.61 | Balanced Accuracy: 0.70
INFO:__main__:Best Balanced Accuracy Seen, validation/test: 0.74 0.74
!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!counter: 49, score: 0.699281045751634, best_s
core: 0.7360784313725489
INFO:__main__:Epoch: 555 | Total Loss: 0.65 | Balanced Accuracy: 0.70
INFO:__main__:Best Balanced Accuracy Seen, validation/test: 0.74 0.74
!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!counter: 50, score: 0.7020915032679739, best_
score: 0.7360784313725489
INFO:__main__:Epoch: 556 | Total Loss: 0.60 | Balanced Accuracy: 0.71
INFO:__main__:Best Balanced Accuracy Seen, validation/test: 0.74 0.74
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!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!counter: 51, score: 0.7126143790849673, best_
score: 0.7360784313725489
INFO:__main__:Epoch: 557 | Total Loss: 0.57 | Balanced Accuracy: 0.58
INFO:__main__:Best Balanced Accuracy Seen, validation/test: 0.74 0.74
!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!counter: 52, score: 0.5750326797385621, best_
score: 0.7360784313725489
INFO:__main__:Epoch: 558 | Total Loss: 0.82 | Balanced Accuracy: 0.55
INFO:__main__:Best Balanced Accuracy Seen, validation/test: 0.74 0.74
!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!counter: 53, score: 0.5517647058823529, best_
score: 0.7360784313725489
INFO:__main__:Epoch: 559 | Total Loss: 0.65 | Balanced Accuracy: 0.63
INFO:__main__:Best Balanced Accuracy Seen, validation/test: 0.74 0.74
!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!counter: 54, score: 0.6311764705882353, best_
score: 0.7360784313725489
INFO:__main__:Epoch: 560 | Total Loss: 0.87 | Balanced Accuracy: 0.66
INFO:__main__:Best Balanced Accuracy Seen, validation/test: 0.74 0.74
!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!counter: 55, score: 0.6592810457516339, best_
score: 0.7360784313725489
INFO:__main__:Epoch: 561 | Total Loss: 0.80 | Balanced Accuracy: 0.65
INFO:__main__:Best Balanced Accuracy Seen, validation/test: 0.74 0.74
!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!counter: 56, score: 0.6468627450980392, best_
score: 0.7360784313725489
INFO:__main__:Epoch: 562 | Total Loss: 0.66 | Balanced Accuracy: 0.56
INFO:__main__:Best Balanced Accuracy Seen, validation/test: 0.74 0.74
!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!counter: 57, score: 0.5550326797385621, best_
score: 0.7360784313725489
INFO:__main__:Epoch: 563 | Total Loss: 0.65 | Balanced Accuracy: 0.56
INFO:__main__:Best Balanced Accuracy Seen, validation/test: 0.74 0.74
!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!counter: 58, score: 0.5602614379084968, best_
score: 0.7360784313725489
INFO:__main__:Epoch: 564 | Total Loss: 0.70 | Balanced Accuracy: 0.62
INFO:__main__:Best Balanced Accuracy Seen, validation/test: 0.74 0.74
!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!counter: 59, score: 0.6244444444444445, best_
score: 0.7360784313725489
INFO:__main__:Epoch: 565 | Total Loss: 0.60 | Balanced Accuracy: 0.64
INFO:__main__:Best Balanced Accuracy Seen, validation/test: 0.74 0.74
!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!counter: 60, score: 0.640718954248366, best_s
core: 0.7360784313725489
INFO:__main__:Epoch: 566 | Total Loss: 0.67 | Balanced Accuracy: 0.55
INFO:__main__:Best Balanced Accuracy Seen, validation/test: 0.74 0.74
!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!counter: 61, score: 0.5486928104575163, best_
score: 0.7360784313725489
INFO:__main__:Epoch: 567 | Total Loss: 0.58 | Balanced Accuracy: 0.66
INFO:__main__:Best Balanced Accuracy Seen, validation/test: 0.74 0.74
!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!counter: 62, score: 0.6575816993464053, best_
score: 0.7360784313725489
INFO:__main__:Epoch: 568 | Total Loss: 0.80 | Balanced Accuracy: 0.60
INFO:__main__:Best Balanced Accuracy Seen, validation/test: 0.74 0.74
!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!counter: 63, score: 0.604967320261438, best_s
core: 0.7360784313725489
INFO:__main__:Epoch: 569 | Total Loss: 0.69 | Balanced Accuracy: 0.53
INFO:__main__:Best Balanced Accuracy Seen, validation/test: 0.74 0.74
!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!counter: 64, score: 0.5313071895424837, best_
score: 0.7360784313725489
INFO:__main__:Epoch: 570 | Total Loss: 0.64 | Balanced Accuracy: 0.49
INFO:__main__:Best Balanced Accuracy Seen, validation/test: 0.74 0.74
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!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!counter: 65, score: 0.4874509803921569, best_
score: 0.7360784313725489
INFO:__main__:Epoch: 571 | Total Loss: 0.67 | Balanced Accuracy: 0.62
INFO:__main__:Best Balanced Accuracy Seen, validation/test: 0.74 0.74
!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!counter: 66, score: 0.6227450980392156, best_
score: 0.7360784313725489
INFO:__main__:Epoch: 572 | Total Loss: 0.62 | Balanced Accuracy: 0.62
INFO:__main__:Best Balanced Accuracy Seen, validation/test: 0.74 0.74
!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!counter: 67, score: 0.615686274509804, best_s
core: 0.7360784313725489
INFO:__main__:Epoch: 573 | Total Loss: 0.77 | Balanced Accuracy: 0.67
INFO:__main__:Best Balanced Accuracy Seen, validation/test: 0.74 0.74
!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!counter: 68, score: 0.665359477124183, best_s
core: 0.7360784313725489
INFO:__main__:Epoch: 574 | Total Loss: 0.63 | Balanced Accuracy: 0.69
INFO:__main__:Best Balanced Accuracy Seen, validation/test: 0.74 0.74
!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!counter: 69, score: 0.6874509803921569, best_
score: 0.7360784313725489
INFO:__main__:Epoch: 575 | Total Loss: 0.65 | Balanced Accuracy: 0.66
INFO:__main__:Best Balanced Accuracy Seen, validation/test: 0.74 0.74
!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!counter: 70, score: 0.6641176470588235, best_
score: 0.7360784313725489
INFO:__main__:Epoch: 576 | Total Loss: 0.63 | Balanced Accuracy: 0.55
INFO:__main__:Best Balanced Accuracy Seen, validation/test: 0.74 0.74
!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!counter: 71, score: 0.5470588235294117, best_
score: 0.7360784313725489
INFO:__main__:Epoch: 577 | Total Loss: 0.68 | Balanced Accuracy: 0.60
INFO:__main__:Best Balanced Accuracy Seen, validation/test: 0.74 0.74
!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!counter: 72, score: 0.604640522875817, best_s
core: 0.7360784313725489
INFO:__main__:Epoch: 578 | Total Loss: 0.82 | Balanced Accuracy: 0.65
INFO:__main__:Best Balanced Accuracy Seen, validation/test: 0.74 0.74
!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!counter: 73, score: 0.6456862745098039, best_
score: 0.7360784313725489
INFO:__main__:Epoch: 579 | Total Loss: 0.72 | Balanced Accuracy: 0.65
INFO:__main__:Best Balanced Accuracy Seen, validation/test: 0.74 0.74
!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!counter: 74, score: 0.6543137254901961, best_
score: 0.7360784313725489
INFO:__main__:Epoch: 580 | Total Loss: 0.62 | Balanced Accuracy: 0.53
INFO:__main__:Best Balanced Accuracy Seen, validation/test: 0.74 0.74
!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!counter: 75, score: 0.5293464052287581, best_
score: 0.7360784313725489
INFO:__main__:Epoch: 581 | Total Loss: 0.65 | Balanced Accuracy: 0.73
INFO:__main__:Best Balanced Accuracy Seen, validation/test: 0.74 0.74
!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!counter: 76, score: 0.7264705882352942, best_
score: 0.7360784313725489
INFO:__main__:Epoch: 582 | Total Loss: 0.66 | Balanced Accuracy: 0.66
INFO:__main__:Best Balanced Accuracy Seen, validation/test: 0.74 0.74
!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!counter: 77, score: 0.6572549019607844, best_
score: 0.7360784313725489
INFO:__main__:Epoch: 583 | Total Loss: 0.81 | Balanced Accuracy: 0.69
INFO:__main__:Best Balanced Accuracy Seen, validation/test: 0.74 0.74
!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!counter: 78, score: 0.694640522875817, best_s
core: 0.7360784313725489
INFO:__main__:Epoch: 584 | Total Loss: 0.60 | Balanced Accuracy: 0.72
INFO:__main__:Best Balanced Accuracy Seen, validation/test: 0.74 0.74
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!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!counter: 79, score: 0.7247712418300654, best_
score: 0.7360784313725489
INFO:__main__:Epoch: 585 | Total Loss: 0.63 | Balanced Accuracy: 0.68
INFO:__main__:Best Balanced Accuracy Seen, validation/test: 0.74 0.74
!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!counter: 80, score: 0.683921568627451, best_s
core: 0.7360784313725489
INFO:__main__:Epoch: 586 | Total Loss: 0.60 | Balanced Accuracy: 0.69
INFO:__main__:Best Balanced Accuracy Seen, validation/test: 0.74 0.74
!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!counter: 81, score: 0.6934640522875818, best_
score: 0.7360784313725489
INFO:__main__:Epoch: 587 | Total Loss: 0.65 | Balanced Accuracy: 0.69
INFO:__main__:Best Balanced Accuracy Seen, validation/test: 0.74 0.74
!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!counter: 82, score: 0.6935294117647058, best_
score: 0.7360784313725489
INFO:__main__:Epoch: 588 | Total Loss: 0.69 | Balanced Accuracy: 0.70
INFO:__main__:Best Balanced Accuracy Seen, validation/test: 0.74 0.74
!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!counter: 83, score: 0.6986928104575164, best_
score: 0.7360784313725489
INFO:__main__:Epoch: 589 | Total Loss: 0.62 | Balanced Accuracy: 0.69
INFO:__main__:Best Balanced Accuracy Seen, validation/test: 0.74 0.74
!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!counter: 84, score: 0.688888888888889, best_s
core: 0.7360784313725489
INFO:__main__:Epoch: 590 | Total Loss: 0.63 | Balanced Accuracy: 0.70
INFO:__main__:Best Balanced Accuracy Seen, validation/test: 0.74 0.74
!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!counter: 85, score: 0.7045751633986929, best_
score: 0.7360784313725489
INFO:__main__:Epoch: 591 | Total Loss: 0.58 | Balanced Accuracy: 0.67
INFO:__main__:Best Balanced Accuracy Seen, validation/test: 0.74 0.74
!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!counter: 86, score: 0.6695424836601308, best_
score: 0.7360784313725489
INFO:__main__:Epoch: 592 | Total Loss: 0.64 | Balanced Accuracy: 0.72
INFO:__main__:Best Balanced Accuracy Seen, validation/test: 0.74 0.74
!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!counter: 87, score: 0.7247712418300654, best_
score: 0.7360784313725489
INFO:__main__:Epoch: 593 | Total Loss: 0.81 | Balanced Accuracy: 0.72
INFO:__main__:Best Balanced Accuracy Seen, validation/test: 0.74 0.74
!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!counter: 88, score: 0.7168627450980392, best_
score: 0.7360784313725489
INFO:__main__:Epoch: 594 | Total Loss: 0.72 | Balanced Accuracy: 0.67
INFO:__main__:Best Balanced Accuracy Seen, validation/test: 0.74 0.74
!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!counter: 89, score: 0.6713071895424836, best_
score: 0.7360784313725489
INFO:__main__:Epoch: 595 | Total Loss: 0.73 | Balanced Accuracy: 0.52
INFO:__main__:Best Balanced Accuracy Seen, validation/test: 0.74 0.74
!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!counter: 90, score: 0.5184967320261439, best_
score: 0.7360784313725489
INFO:__main__:Epoch: 596 | Total Loss: 0.75 | Balanced Accuracy: 0.58
INFO:__main__:Best Balanced Accuracy Seen, validation/test: 0.74 0.74
!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!counter: 91, score: 0.5794771241830066, best_
score: 0.7360784313725489
INFO:__main__:Epoch: 597 | Total Loss: 0.89 | Balanced Accuracy: 0.70
INFO:__main__:Best Balanced Accuracy Seen, validation/test: 0.74 0.74
!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!counter: 92, score: 0.6966666666666667, best_
score: 0.7360784313725489
INFO:__main__:Epoch: 598 | Total Loss: 0.77 | Balanced Accuracy: 0.66
INFO:__main__:Best Balanced Accuracy Seen, validation/test: 0.74 0.74
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!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!counter: 93, score: 0.6553594771241831, best_
score: 0.7360784313725489
INFO:__main__:Epoch: 599 | Total Loss: 0.68 | Balanced Accuracy: 0.65
INFO:__main__:Best Balanced Accuracy Seen, validation/test: 0.74 0.74
!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!counter: 94, score: 0.6511111111111111, best_
score: 0.7360784313725489
INFO:__main__:Epoch: 600 | Total Loss: 0.64 | Balanced Accuracy: 0.69
INFO:__main__:Best Balanced Accuracy Seen, validation/test: 0.74 0.74
!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!counter: 95, score: 0.6868627450980392, best_
score: 0.7360784313725489
INFO:__main__:Epoch: 601 | Total Loss: 0.69 | Balanced Accuracy: 0.71
INFO:__main__:Best Balanced Accuracy Seen, validation/test: 0.74 0.74
!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!counter: 96, score: 0.7129411764705882, best_
score: 0.7360784313725489
INFO:__main__:Epoch: 602 | Total Loss: 0.75 | Balanced Accuracy: 0.65
INFO:__main__:Best Balanced Accuracy Seen, validation/test: 0.74 0.74
!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!counter: 97, score: 0.654640522875817, best_s
core: 0.7360784313725489
INFO:__main__:Epoch: 603 | Total Loss: 0.59 | Balanced Accuracy: 0.67
INFO:__main__:Best Balanced Accuracy Seen, validation/test: 0.74 0.74
!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!counter: 98, score: 0.6741176470588236, best_
score: 0.7360784313725489
INFO:__main__:Epoch: 604 | Total Loss: 0.62 | Balanced Accuracy: 0.67
INFO:__main__:Best Balanced Accuracy Seen, validation/test: 0.74 0.74
!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!counter: 99, score: 0.6670588235294117, best_
score: 0.7360784313725489
INFO:__main__:Epoch: 605 | Total Loss: 0.61 | Balanced Accuracy: 0.62
INFO:__main__:Best Balanced Accuracy Seen, validation/test: 0.74 0.74
!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!counter: 100, score: 0.6207189542483661, best
_score: 0.7360784313725489
INFO:__main__:Epoch: 606 | Total Loss: 0.62 | Balanced Accuracy: 0.67
INFO:__main__:Best Balanced Accuracy Seen, validation/test: 0.74 0.74
!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!counter: 101, score: 0.6699999999999999, best
_score: 0.7360784313725489
INFO:__main__:Epoch: 607 | Total Loss: 0.62 | Balanced Accuracy: 0.67
INFO:__main__:Best Balanced Accuracy Seen, validation/test: 0.74 0.74
!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!counter: 102, score: 0.6716993464052288, best
_score: 0.7360784313725489
INFO:__main__:Epoch: 608 | Total Loss: 0.63 | Balanced Accuracy: 0.59
INFO:__main__:Best Balanced Accuracy Seen, validation/test: 0.74 0.74
!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!counter: 103, score: 0.5883006535947711, best
_score: 0.7360784313725489
INFO:__main__:Epoch: 609 | Total Loss: 0.78 | Balanced Accuracy: 0.69
INFO:__main__:Best Balanced Accuracy Seen, validation/test: 0.74 0.74
!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!counter: 104, score: 0.6937254901960784, best
_score: 0.7360784313725489
INFO:__main__:Epoch: 610 | Total Loss: 0.70 | Balanced Accuracy: 0.69
INFO:__main__:Best Balanced Accuracy Seen, validation/test: 0.74 0.74
!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!counter: 105, score: 0.6893464052287581, best
_score: 0.7360784313725489
INFO:__main__:Epoch: 611 | Total Loss: 0.80 | Balanced Accuracy: 0.69
INFO:__main__:Best Balanced Accuracy Seen, validation/test: 0.74 0.74
!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!counter: 106, score: 0.6930065359477124, best
_score: 0.7360784313725489
INFO:__main__:Epoch: 612 | Total Loss: 0.61 | Balanced Accuracy: 0.70
INFO:__main__:Best Balanced Accuracy Seen, validation/test: 0.74 0.74
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!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!counter: 107, score: 0.7015032679738562, best
_score: 0.7360784313725489
INFO:__main__:Epoch: 613 | Total Loss: 0.79 | Balanced Accuracy: 0.65
INFO:__main__:Best Balanced Accuracy Seen, validation/test: 0.74 0.74
!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!counter: 108, score: 0.645359477124183, best_
score: 0.7360784313725489
INFO:__main__:Epoch: 614 | Total Loss: 0.68 | Balanced Accuracy: 0.68
INFO:__main__:Best Balanced Accuracy Seen, validation/test: 0.74 0.74
!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!counter: 109, score: 0.6816339869281046, best
_score: 0.7360784313725489
INFO:__main__:Epoch: 615 | Total Loss: 0.74 | Balanced Accuracy: 0.57
INFO:__main__:Best Balanced Accuracy Seen, validation/test: 0.74 0.74
!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!counter: 110, score: 0.5701307189542484, best
_score: 0.7360784313725489
INFO:__main__:Epoch: 616 | Total Loss: 0.65 | Balanced Accuracy: 0.65
INFO:__main__:Best Balanced Accuracy Seen, validation/test: 0.74 0.74
!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!counter: 111, score: 0.6452287581699346, best
_score: 0.7360784313725489
INFO:__main__:Epoch: 617 | Total Loss: 0.66 | Balanced Accuracy: 0.64
INFO:__main__:Best Balanced Accuracy Seen, validation/test: 0.74 0.74
!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!counter: 112, score: 0.6409803921568628, best
_score: 0.7360784313725489
INFO:__main__:Epoch: 618 | Total Loss: 0.69 | Balanced Accuracy: 0.62
INFO:__main__:Best Balanced Accuracy Seen, validation/test: 0.74 0.74
!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!counter: 113, score: 0.6150326797385621, best
_score: 0.7360784313725489
INFO:__main__:Epoch: 619 | Total Loss: 0.61 | Balanced Accuracy: 0.71
INFO:__main__:Best Balanced Accuracy Seen, validation/test: 0.74 0.74
!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!counter: 114, score: 0.7133333333333333, best
_score: 0.7360784313725489
INFO:__main__:Epoch: 620 | Total Loss: 0.69 | Balanced Accuracy: 0.71
INFO:__main__:Best Balanced Accuracy Seen, validation/test: 0.74 0.74
!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!counter: 115, score: 0.7064705882352941, best
_score: 0.7360784313725489
INFO:__main__:Epoch: 621 | Total Loss: 0.66 | Balanced Accuracy: 0.68
INFO:__main__:Best Balanced Accuracy Seen, validation/test: 0.74 0.74
!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!counter: 116, score: 0.6841176470588235, best
_score: 0.7360784313725489
INFO:__main__:Epoch: 622 | Total Loss: 0.72 | Balanced Accuracy: 0.62
INFO:__main__:Best Balanced Accuracy Seen, validation/test: 0.74 0.74
!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!counter: 117, score: 0.6205228758169935, best
_score: 0.7360784313725489
INFO:__main__:Epoch: 623 | Total Loss: 0.68 | Balanced Accuracy: 0.69
INFO:__main__:Best Balanced Accuracy Seen, validation/test: 0.74 0.74
!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!counter: 118, score: 0.6864705882352942, best
_score: 0.7360784313725489
INFO:__main__:Epoch: 624 | Total Loss: 0.65 | Balanced Accuracy: 0.68
INFO:__main__:Best Balanced Accuracy Seen, validation/test: 0.74 0.74
!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!counter: 119, score: 0.676470588235294, best_
score: 0.7360784313725489
INFO:__main__:Epoch: 625 | Total Loss: 0.82 | Balanced Accuracy: 0.65
INFO:__main__:Best Balanced Accuracy Seen, validation/test: 0.74 0.74
!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!counter: 120, score: 0.6540522875816993, best
_score: 0.7360784313725489
INFO:__main__:Epoch: 626 | Total Loss: 0.69 | Balanced Accuracy: 0.70
INFO:__main__:Best Balanced Accuracy Seen, validation/test: 0.74 0.74
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!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!counter: 121, score: 0.7009150326797385, best
_score: 0.7360784313725489
INFO:__main__:Epoch: 627 | Total Loss: 0.76 | Balanced Accuracy: 0.69
INFO:__main__:Best Balanced Accuracy Seen, validation/test: 0.74 0.74
!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!counter: 122, score: 0.689281045751634, best_
score: 0.7360784313725489
INFO:__main__:Epoch: 628 | Total Loss: 0.76 | Balanced Accuracy: 0.65
INFO:__main__:Best Balanced Accuracy Seen, validation/test: 0.74 0.74
!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!counter: 123, score: 0.6540522875816993, best
_score: 0.7360784313725489
INFO:__main__:Epoch: 629 | Total Loss: 0.62 | Balanced Accuracy: 0.66
INFO:__main__:Best Balanced Accuracy Seen, validation/test: 0.74 0.74
!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!counter: 124, score: 0.6581699346405229, best
_score: 0.7360784313725489
INFO:__main__:Epoch: 630 | Total Loss: 0.69 | Balanced Accuracy: 0.70
INFO:__main__:Best Balanced Accuracy Seen, validation/test: 0.74 0.74
!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!counter: 125, score: 0.6950326797385621, best
_score: 0.7360784313725489
INFO:__main__:Epoch: 631 | Total Loss: 0.75 | Balanced Accuracy: 0.65
INFO:__main__:Best Balanced Accuracy Seen, validation/test: 0.74 0.74
!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!counter: 126, score: 0.6496732026143791, best
_score: 0.7360784313725489
INFO:__main__:Epoch: 632 | Total Loss: 0.71 | Balanced Accuracy: 0.66
INFO:__main__:Best Balanced Accuracy Seen, validation/test: 0.74 0.74
!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!counter: 127, score: 0.6589542483660131, best
_score: 0.7360784313725489
INFO:__main__:Epoch: 633 | Total Loss: 0.66 | Balanced Accuracy: 0.71
INFO:__main__:Best Balanced Accuracy Seen, validation/test: 0.74 0.74
!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!counter: 128, score: 0.7095424836601308, best
_score: 0.7360784313725489
INFO:__main__:Epoch: 634 | Total Loss: 0.68 | Balanced Accuracy: 0.67
INFO:__main__:Best Balanced Accuracy Seen, validation/test: 0.74 0.74
!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!counter: 129, score: 0.6661437908496732, best
_score: 0.7360784313725489
INFO:__main__:Epoch: 635 | Total Loss: 0.83 | Balanced Accuracy: 0.64
INFO:__main__:Best Balanced Accuracy Seen, validation/test: 0.74 0.74
!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!counter: 130, score: 0.6416993464052289, best
_score: 0.7360784313725489
INFO:__main__:Epoch: 636 | Total Loss: 0.62 | Balanced Accuracy: 0.67
INFO:__main__:Best Balanced Accuracy Seen, validation/test: 0.74 0.74
!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!counter: 131, score: 0.6670588235294117, best
_score: 0.7360784313725489
INFO:__main__:Epoch: 637 | Total Loss: 0.65 | Balanced Accuracy: 0.72
INFO:__main__:Best Balanced Accuracy Seen, validation/test: 0.74 0.74
!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!counter: 132, score: 0.7247712418300654, best
_score: 0.7360784313725489
INFO:__main__:Epoch: 638 | Total Loss: 0.73 | Balanced Accuracy: 0.67
INFO:__main__:Best Balanced Accuracy Seen, validation/test: 0.74 0.74
!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!counter: 133, score: 0.6670588235294117, best
_score: 0.7360784313725489
INFO:__main__:Epoch: 639 | Total Loss: 0.72 | Balanced Accuracy: 0.71
INFO:__main__:Best Balanced Accuracy Seen, validation/test: 0.74 0.74
!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!counter: 134, score: 0.7063398692810458, best
_score: 0.7360784313725489
INFO:__main__:Epoch: 640 | Total Loss: 0.58 | Balanced Accuracy: 0.71
INFO:__main__:Best Balanced Accuracy Seen, validation/test: 0.74 0.74
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!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!counter: 135, score: 0.7135294117647059, best \_score: 0.7360784313725489  
INFO:\_\_main\_\_:Epoch: 641 | Total Loss: 0.66 | Balanced Accuracy: 0.71  
INFO:\_\_main\_\_:Best Balanced Accuracy Seen, validation/test: 0.74 0.74  
!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!counter: 136, score: 0.7139215686274509, best \_score: 0.7360784313725489  
INFO:\_\_main\_\_:Epoch: 642 | Total Loss: 0.79 | Balanced Accuracy: 0.68  
INFO:\_\_main\_\_:Best Balanced Accuracy Seen, validation/test: 0.74 0.74  
!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!counter: 137, score: 0.6811111111111111, best \_score: 0.7360784313725489  
INFO:\_\_main\_\_:Epoch: 643 | Total Loss: 0.64 | Balanced Accuracy: 0.71  
INFO:\_\_main\_\_:Best Balanced Accuracy Seen, validation/test: 0.74 0.74  
!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!counter: 138, score: 0.7058823529411765, best \_score: 0.7360784313725489  
INFO:\_\_main\_\_:Epoch: 644 | Total Loss: 0.66 | Balanced Accuracy: 0.61  
INFO:\_\_main\_\_:Best Balanced Accuracy Seen, validation/test: 0.74 0.74  
!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!counter: 139, score: 0.6115032679738562, best \_score: 0.7360784313725489  
INFO:\_\_main\_\_:Epoch: 645 | Total Loss: 0.63 | Balanced Accuracy: 0.72  
INFO:\_\_main\_\_:Best Balanced Accuracy Seen, validation/test: 0.74 0.74  
!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!counter: 140, score: 0.7160784313725491, best \_score: 0.7360784313725489  
INFO:\_\_main\_\_:Epoch: 646 | Total Loss: 0.70 | Balanced Accuracy: 0.67  
INFO:\_\_main\_\_:Best Balanced Accuracy Seen, validation/test: 0.74 0.74  
!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!counter: 141, score: 0.6665359477124183, best \_score: 0.7360784313725489  
INFO:\_\_main\_\_:Epoch: 647 | Total Loss: 0.61 | Balanced Accuracy: 0.67  
INFO:\_\_main\_\_:Best Balanced Accuracy Seen, validation/test: 0.74 0.74  
!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!counter: 142, score: 0.6686928104575164, best \_score: 0.7360784313725489  
INFO:\_\_main\_\_:Epoch: 648 | Total Loss: 0.72 | Balanced Accuracy: 0.64  
INFO:\_\_main\_\_:Best Balanced Accuracy Seen, validation/test: 0.74 0.74  
!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!counter: 143, score: 0.6437908496732027, best \_score: 0.7360784313725489  
INFO:\_\_main\_\_:Epoch: 649 | Total Loss: 0.77 | Balanced Accuracy: 0.68  
INFO:\_\_main\_\_:Best Balanced Accuracy Seen, validation/test: 0.74 0.74  
!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!counter: 144, score: 0.6825490196078432, best \_score: 0.7360784313725489  
INFO:\_\_main\_\_:Epoch: 650 | Total Loss: 0.78 | Balanced Accuracy: 0.64  
INFO:\_\_main\_\_:Best Balanced Accuracy Seen, validation/test: 0.74 0.74  
!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!counter: 145, score: 0.6389542483660131, best \_score: 0.7360784313725489  
INFO:\_\_main\_\_:Epoch: 651 | Total Loss: 0.72 | Balanced Accuracy: 0.67  
INFO:\_\_main\_\_:Best Balanced Accuracy Seen, validation/test: 0.74 0.74  
!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!counter: 146, score: 0.6670588235294117, best \_score: 0.7360784313725489  
INFO:\_\_main\_\_:Epoch: 652 | Total Loss: 0.85 | Balanced Accuracy: 0.60  
INFO:\_\_main\_\_:Best Balanced Accuracy Seen, validation/test: 0.74 0.74  
!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!counter: 147, score: 0.6022875816993464, best \_score: 0.7360784313725489  
INFO:\_\_main\_\_:Epoch: 653 | Total Loss: 0.72 | Balanced Accuracy: 0.65  
INFO:\_\_main\_\_:Best Balanced Accuracy Seen, validation/test: 0.74 0.74  
!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!counter: 148, score: 0.6535947712418301, best \_score: 0.7360784313725489  
INFO:\_\_main\_\_:Epoch: 654 | Total Loss: 0.71 | Balanced Accuracy: 0.71  
INFO:\_\_main\_\_:Best Balanced Accuracy Seen, validation/test: 0.74 0.74

!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!counter: 149, score: 0.7063398692810458, best \_score: 0.7360784313725489

INFO:\_\_main\_\_:Epoch: 655 | Total Loss: 0.69 | Balanced Accuracy: 0.69

INFO:\_\_main\_\_:Best Balanced Accuracy Seen, validation/test: 0.74 0.74

!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!counter: 150, score: 0.6944444444444445, best \_score: 0.7360784313725489

INFO:\_\_main\_\_:Epoch: 656 | Total Loss: 0.65 | Balanced Accuracy: 0.68

INFO:\_\_main\_\_:Best Balanced Accuracy Seen, validation/test: 0.74 0.74

!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!counter: 151, score: 0.6809803921568628, best \_score: 0.7360784313725489

INFO:\_\_main\_\_:Epoch: 657 | Total Loss: 0.69 | Balanced Accuracy: 0.69

INFO:\_\_main\_\_:Best Balanced Accuracy Seen, validation/test: 0.74 0.74

!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!counter: 152, score: 0.6894771241830066, best \_score: 0.7360784313725489

INFO:\_\_main\_\_:Epoch: 658 | Total Loss: 0.72 | Balanced Accuracy: 0.60

INFO:\_\_main\_\_:Best Balanced Accuracy Seen, validation/test: 0.74 0.74

!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!counter: 153, score: 0.5951633986928105, best \_score: 0.7360784313725489

INFO:\_\_main\_\_:Epoch: 659 | Total Loss: 0.72 | Balanced Accuracy: 0.67

INFO:\_\_main\_\_:Best Balanced Accuracy Seen, validation/test: 0.74 0.74

!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!counter: 154, score: 0.6742483660130719, best \_score: 0.7360784313725489

INFO:\_\_main\_\_:Epoch: 660 | Total Loss: 0.63 | Balanced Accuracy: 0.69

INFO:\_\_main\_\_:Best Balanced Accuracy Seen, validation/test: 0.74 0.74

!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!counter: 155, score: 0.6888888888888889, best \_score: 0.7360784313725489

INFO:\_\_main\_\_:Epoch: 661 | Total Loss: 0.71 | Balanced Accuracy: 0.62

INFO:\_\_main\_\_:Best Balanced Accuracy Seen, validation/test: 0.74 0.74

!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!counter: 156, score: 0.6184313725490197, best \_score: 0.7360784313725489

INFO:\_\_main\_\_:Epoch: 662 | Total Loss: 0.72 | Balanced Accuracy: 0.68

INFO:\_\_main\_\_:Best Balanced Accuracy Seen, validation/test: 0.74 0.74

!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!counter: 157, score: 0.6837254901960784, best \_score: 0.7360784313725489

INFO:\_\_main\_\_:Epoch: 663 | Total Loss: 0.66 | Balanced Accuracy: 0.60

INFO:\_\_main\_\_:Best Balanced Accuracy Seen, validation/test: 0.74 0.74

!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!counter: 158, score: 0.5960130718954249, best \_score: 0.7360784313725489

INFO:\_\_main\_\_:Epoch: 664 | Total Loss: 0.59 | Balanced Accuracy: 0.66

INFO:\_\_main\_\_:Best Balanced Accuracy Seen, validation/test: 0.74 0.74

!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!counter: 159, score: 0.6564705882352941, best \_score: 0.7360784313725489

INFO:\_\_main\_\_:Epoch: 665 | Total Loss: 0.67 | Balanced Accuracy: 0.69

INFO:\_\_main\_\_:Best Balanced Accuracy Seen, validation/test: 0.74 0.74

!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!counter: 160, score: 0.6918300653594772, best \_score: 0.7360784313725489

INFO:\_\_main\_\_:Epoch: 666 | Total Loss: 0.69 | Balanced Accuracy: 0.59

INFO:\_\_main\_\_:Best Balanced Accuracy Seen, validation/test: 0.74 0.74

!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!counter: 161, score: 0.5913071895424836, best \_score: 0.7360784313725489

INFO:\_\_main\_\_:Epoch: 667 | Total Loss: 0.70 | Balanced Accuracy: 0.63

INFO:\_\_main\_\_:Best Balanced Accuracy Seen, validation/test: 0.74 0.74

!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!counter: 162, score: 0.6286928104575163, best \_score: 0.7360784313725489

INFO:\_\_main\_\_:Epoch: 668 | Total Loss: 0.67 | Balanced Accuracy: 0.64

INFO:\_\_main\_\_:Best Balanced Accuracy Seen, validation/test: 0.74 0.74

!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!counter: 163, score: 0.6398039215686274, best \_score: 0.7360784313725489  
INFO:\_\_main\_\_:Epoch: 669 | Total Loss: 0.67 | Balanced Accuracy: 0.70  
INFO:\_\_main\_\_:Best Balanced Accuracy Seen, validation/test: 0.74 0.74  
!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!counter: 164, score: 0.704248366013072, best \_score: 0.7360784313725489  
INFO:\_\_main\_\_:Epoch: 670 | Total Loss: 0.61 | Balanced Accuracy: 0.71  
INFO:\_\_main\_\_:Best Balanced Accuracy Seen, validation/test: 0.74 0.74  
!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!counter: 165, score: 0.7113071895424836, best \_score: 0.7360784313725489  
INFO:\_\_main\_\_:Epoch: 671 | Total Loss: 0.58 | Balanced Accuracy: 0.69  
INFO:\_\_main\_\_:Best Balanced Accuracy Seen, validation/test: 0.74 0.74  
!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!counter: 166, score: 0.6879738562091503, best \_score: 0.7360784313725489  
INFO:\_\_main\_\_:Epoch: 672 | Total Loss: 0.65 | Balanced Accuracy: 0.69  
INFO:\_\_main\_\_:Best Balanced Accuracy Seen, validation/test: 0.74 0.74  
!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!counter: 167, score: 0.685359477124183, best \_score: 0.7360784313725489  
INFO:\_\_main\_\_:Epoch: 673 | Total Loss: 0.72 | Balanced Accuracy: 0.66  
INFO:\_\_main\_\_:Best Balanced Accuracy Seen, validation/test: 0.74 0.74  
!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!counter: 168, score: 0.6635294117647058, best \_score: 0.7360784313725489  
INFO:\_\_main\_\_:Epoch: 674 | Total Loss: 0.69 | Balanced Accuracy: 0.71  
INFO:\_\_main\_\_:Best Balanced Accuracy Seen, validation/test: 0.74 0.74  
!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!counter: 169, score: 0.7077777777777777, best \_score: 0.7360784313725489  
INFO:\_\_main\_\_:Epoch: 675 | Total Loss: 0.78 | Balanced Accuracy: 0.70  
INFO:\_\_main\_\_:Best Balanced Accuracy Seen, validation/test: 0.74 0.74  
!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!counter: 170, score: 0.6972549019607843, best \_score: 0.7360784313725489  
INFO:\_\_main\_\_:Epoch: 676 | Total Loss: 0.68 | Balanced Accuracy: 0.71  
INFO:\_\_main\_\_:Best Balanced Accuracy Seen, validation/test: 0.74 0.74  
!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!counter: 171, score: 0.7086928104575163, best \_score: 0.7360784313725489  
INFO:\_\_main\_\_:Epoch: 677 | Total Loss: 0.92 | Balanced Accuracy: 0.71  
INFO:\_\_main\_\_:Best Balanced Accuracy Seen, validation/test: 0.74 0.74  
!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!counter: 172, score: 0.7070588235294117, best \_score: 0.7360784313725489  
INFO:\_\_main\_\_:Epoch: 678 | Total Loss: 0.63 | Balanced Accuracy: 0.70  
INFO:\_\_main\_\_:Best Balanced Accuracy Seen, validation/test: 0.74 0.74  
!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!counter: 173, score: 0.6979738562091503, best \_score: 0.7360784313725489  
INFO:\_\_main\_\_:Epoch: 679 | Total Loss: 0.63 | Balanced Accuracy: 0.68  
INFO:\_\_main\_\_:Best Balanced Accuracy Seen, validation/test: 0.74 0.74  
!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!counter: 174, score: 0.6769934640522877, best \_score: 0.7360784313725489  
INFO:\_\_main\_\_:Epoch: 680 | Total Loss: 0.71 | Balanced Accuracy: 0.57  
INFO:\_\_main\_\_:Best Balanced Accuracy Seen, validation/test: 0.74 0.74  
!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!counter: 175, score: 0.5720915032679739, best \_score: 0.7360784313725489  
INFO:\_\_main\_\_:Epoch: 681 | Total Loss: 0.82 | Balanced Accuracy: 0.67  
INFO:\_\_main\_\_:Best Balanced Accuracy Seen, validation/test: 0.74 0.74  
!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!counter: 176, score: 0.6740522875816993, best \_score: 0.7360784313725489  
INFO:\_\_main\_\_:Epoch: 682 | Total Loss: 0.77 | Balanced Accuracy: 0.59  
INFO:\_\_main\_\_:Best Balanced Accuracy Seen, validation/test: 0.74 0.74

```
!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!counter: 177, score: 0.5869281045751634, best
_score: 0.7360784313725489
INFO:__main__:Epoch: 683 | Total Loss: 0.66 | Balanced Accuracy: 0.65
INFO:__main__:Best Balanced Accuracy Seen, validation/test: 0.74 0.74
!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!counter: 178, score: 0.6509150326797385, best
_score: 0.7360784313725489
INFO:__main__:Epoch: 684 | Total Loss: 0.62 | Balanced Accuracy: 0.67
INFO:__main__:Best Balanced Accuracy Seen, validation/test: 0.74 0.74
!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!counter: 179, score: 0.674640522875817, best_
score: 0.7360784313725489
INFO:__main__:Epoch: 685 | Total Loss: 0.68 | Balanced Accuracy: 0.65
INFO:__main__:Best Balanced Accuracy Seen, validation/test: 0.74 0.74
!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!counter: 180, score: 0.6525490196078432, best
_score: 0.7360784313725489
INFO:__main__:Epoch: 686 | Total Loss: 0.70 | Balanced Accuracy: 0.61
INFO:__main__:Best Balanced Accuracy Seen, validation/test: 0.74 0.74
!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!counter: 181, score: 0.6073202614379085, best
_score: 0.7360784313725489
INFO:__main__:Epoch: 687 | Total Loss: 0.77 | Balanced Accuracy: 0.63
INFO:__main__:Best Balanced Accuracy Seen, validation/test: 0.74 0.74
!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!counter: 182, score: 0.6278431372549019, best
_score: 0.7360784313725489
INFO:__main__:Epoch: 688 | Total Loss: 0.74 | Balanced Accuracy: 0.65
INFO:__main__:Best Balanced Accuracy Seen, validation/test: 0.74 0.74
!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!counter: 183, score: 0.6530718954248366, best
_score: 0.7360784313725489
INFO:__main__:Epoch: 689 | Total Loss: 0.89 | Balanced Accuracy: 0.68
INFO:__main__:Best Balanced Accuracy Seen, validation/test: 0.74 0.74
!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!counter: 184, score: 0.6769281045751634, best
_score: 0.7360784313725489
INFO:__main__:Epoch: 690 | Total Loss: 0.71 | Balanced Accuracy: 0.72
INFO:__main__:Best Balanced Accuracy Seen, validation/test: 0.74 0.74
!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!counter: 185, score: 0.7183006535947712, best
_score: 0.7360784313725489
INFO:__main__:Epoch: 691 | Total Loss: 0.84 | Balanced Accuracy: 0.66
INFO:__main__:Best Balanced Accuracy Seen, validation/test: 0.74 0.74
!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!counter: 186, score: 0.6596078431372548, best
_score: 0.7360784313725489
INFO:__main__:Epoch: 692 | Total Loss: 0.70 | Balanced Accuracy: 0.66
INFO:__main__:Best Balanced Accuracy Seen, validation/test: 0.74 0.74
!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!counter: 187, score: 0.6560784313725491, best
_score: 0.7360784313725489
INFO:__main__:Epoch: 693 | Total Loss: 0.62 | Balanced Accuracy: 0.73
INFO:__main__:Best Balanced Accuracy Seen, validation/test: 0.74 0.74
!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!counter: 188, score: 0.7331372549019607, best
_score: 0.7360784313725489
INFO:__main__:Epoch: 694 | Total Loss: 0.72 | Balanced Accuracy: 0.69
INFO:__main__:Best Balanced Accuracy Seen, validation/test: 0.74 0.74
!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!counter: 189, score: 0.6883006535947712, best
_score: 0.7360784313725489
INFO:__main__:Epoch: 695 | Total Loss: 0.70 | Balanced Accuracy: 0.59
INFO:__main__:Best Balanced Accuracy Seen, validation/test: 0.74 0.74
!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!counter: 190, score: 0.593333333333334, best
_score: 0.7360784313725489
INFO:__main__:Epoch: 696 | Total Loss: 0.67 | Balanced Accuracy: 0.62
INFO:__main__:Best Balanced Accuracy Seen, validation/test: 0.74 0.74
```

```
!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!counter: 191, score: 0.6194117647058823, best
_score: 0.7360784313725489
INFO:__main__:Epoch: 697 | Total Loss: 0.66 | Balanced Accuracy: 0.62
INFO:__main__:Best Balanced Accuracy Seen, validation/test: 0.74 0.74
!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!counter: 192, score: 0.6196078431372548, best
_score: 0.7360784313725489
INFO:__main__:Epoch: 698 | Total Loss: 0.71 | Balanced Accuracy: 0.64
INFO:__main__:Best Balanced Accuracy Seen, validation/test: 0.74 0.74
!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!counter: 193, score: 0.6420261437908498, best
_score: 0.7360784313725489
INFO:__main__:Epoch: 699 | Total Loss: 0.66 | Balanced Accuracy: 0.63
INFO:__main__:Best Balanced Accuracy Seen, validation/test: 0.74 0.74
!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!counter: 194, score: 0.6325490196078433, best
_score: 0.7360784313725489
INFO:__main__:Epoch: 700 | Total Loss: 0.74 | Balanced Accuracy: 0.64
INFO:__main__:Best Balanced Accuracy Seen, validation/test: 0.74 0.74
!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!counter: 195, score: 0.6443790849673202, best
_score: 0.7360784313725489
INFO:__main__:Epoch: 701 | Total Loss: 0.71 | Balanced Accuracy: 0.67
INFO:__main__:Best Balanced Accuracy Seen, validation/test: 0.74 0.74
!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!counter: 196, score: 0.669673202614379, best_
score: 0.7360784313725489
INFO:__main__:Epoch: 702 | Total Loss: 0.69 | Balanced Accuracy: 0.68
INFO:__main__:Best Balanced Accuracy Seen, validation/test: 0.74 0.74
!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!counter: 197, score: 0.6768627450980391, best
_score: 0.7360784313725489
INFO:__main__:Epoch: 703 | Total Loss: 0.68 | Balanced Accuracy: 0.65
INFO:__main__:Best Balanced Accuracy Seen, validation/test: 0.74 0.74
!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!counter: 198, score: 0.6494771241830065, best
_score: 0.7360784313725489
INFO:__main__:Epoch: 704 | Total Loss: 0.63 | Balanced Accuracy: 0.67
INFO:__main__:Best Balanced Accuracy Seen, validation/test: 0.74 0.74
!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!counter: 199, score: 0.6696078431372549, best
_score: 0.7360784313725489
INFO:__main__:Epoch: 705 | Total Loss: 0.74 | Balanced Accuracy: 0.65
INFO:__main__:Best Balanced Accuracy Seen, validation/test: 0.74 0.74
!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!counter: 200, score: 0.6496732026143791, best
_score: 0.7360784313725489
```

## ABMIL Training

This block configures the the training runners for ABMIL, which is very similar to the runner with SAMIL.

```
In [ ]: import json

def train_abmil(
    train_epoch,
    patience,
    early_stopping_warmup,
    eval_every_Xepoch,
    type,
    experiment_dir,
    weights,
    train_loader,
    val_loader,
    model,
    optimizer,
    scheduler,
):
    best_val_raw_Bacc = 0
    best_test_raw_Bacc_at_val = 0

    current_count=0

    logger.info("***** Running training *****")
    logger.info(f"  Num Epochs = {train_epoch}")
    logger.info(f"  Total optimization steps = {train_epoch * len(train_dataset)}")

    early_stopping = EarlyStopping(patience, initial_count=current_count)

    train_loss_df = pd.DataFrame(
        index=range(0, train_epoch), columns=["loss"], dtype="Float32"
    )
    val_accuracy_df = pd.DataFrame(
        index=range(0, train_epoch, eval_every_Xepoch),
        columns=["val_raw_Bacc", "test_raw_Bacc"],
        dtype="Float32",
    )

    for epoch in range(train_epoch):
        TotalTrainLoss_this_epoch = train_one_abmil_epoch(train_epoch, weights, tra
        train_loss_df.loc[epoch] = TotalTrainLoss_this_epoch
        scheduler.step()

        if epoch % eval_every_Xepoch == 0:
            val_raw_Bacc = eval_model(val_loader, model, epoch)
            val_accuracy_df.loc[[epoch], ["val_raw_Bacc"]] = val_raw_Bacc

            if val_raw_Bacc > best_val_raw_Bacc:
                best_val_raw_Bacc = val_raw_Bacc

            test_raw_Bacc = eval_model(test_loader, model, epoch)
            val_accuracy_df.loc[[epoch], ["test_raw_Bacc"]] = test_raw_Bacc

            if test_raw_Bacc > best_test_raw_Bacc_at_val:
                best_test_raw_Bacc_at_val = test_raw_Bacc
                save_checkpoint(model.state_dict(), experiment_dir, filename="b

            logger.info("Epoch: %d | Total Loss: %.2f | Balanced Accuracy: %.2f" %
            logger.info('Best Balanced Accuracy Seen, validation/test: %.2f %.2f' %

        if epoch > early_stopping_warmup:
```

```

        current_count = early_stopping(val_raw_Bacc)

    save_checkpoint(model.state_dict(), experiment_dir, filename="last_checkpoint")

    if early_stopping.early_stop:
        break

gd_csv_filepath = os.path.join('/content/drive/MyDrive/SAMIL/checkpoints/')

train_loss_df.to_csv(
    gd_csv_filepath + "train_loss_df_{}.csv".format(type), sep=",", header=True
)

val_accuracy_df.to_csv(gd_csv_filepath + "val_accuracy_df_{}.csv".format(type),

```

```

In [ ]: def train_one_abmil_epoch(train_epoch, weights, train_loader, model, optimizer, scheduler):
    model.train()
    train_loss = 0

    for data, bag_label in tqdm(train_loader, disable=True):
        optimizer.zero_grad()

        data, bag_label = data.to(device), bag_label.to(device)

        outputs, _ = model(data)
        outputs = outputs.to(device)

        LabeledCELoss = F.cross_entropy(outputs, bag_label, weights)

        LabeledCELoss.backward()
        optimizer.step()

        train_loss += LabeledCELoss.detach().cpu().item()

    train_loss = train_loss / len(train_loader)

    return train_loss

```

This block configures training the ABMIL model. Per the paper, the max epochs is set to 2,000 with a warmup of 500 epochs and patient of 200 epochs.

```
In [ ]: RUNS_DIR = '/content/runs/'

from torch.utils.data import DataLoader

train_loader = DataLoader(
    train_dataset, batch_size=1, shuffle=True, num_workers=8
)
val_loader = DataLoader(val_dataset, batch_size=1, shuffle=False, num_workers=8)
test_loader = DataLoader(test_dataset, batch_size=1, shuffle=False, num_workers=8)

training_seed= 0
data_seed= 0
checkpoint_dir= MODEL_CHECKPOINTS
lr= 0.0008 # learning rate
wd= 0.0001 # weight decay
train_dir= RUNS_DIR + 'SAMIL'
resume= 'None'
train_epoch= 2000 # number of epochs, 2000 defined in the paper. CHANGE ME!
device= device
start_epoch= 0
patience= 200
early_stopping_warmup= 500
eval_every_Xepoch= 1
experiment_type='ABMIL'

set_seed(training_seed)

experiment_name = "{}".format(experiment_type)
experiment_dir = os.path.join(train_dir, experiment_name)
os.makedirs(experiment_dir, exist_ok=True)

weights = '0.463,0.342,0.195'
weights = [float(i) for i in weights.split(',')]
weights = torch.Tensor(weights)
weights = weights.to(device)

model = Attention().to(device)

no_decay = {'bias', 'bn'}
grouped_parameters = [
    {'params': [p for n, p in model.named_parameters() if not any(
        nd in n for nd in no_decay)], 'weight_decay': wd},
    {'params': [p for n, p in model.named_parameters() if any(
        nd in n for nd in no_decay)], 'weight_decay': 0.0}
]
]

optimizer = optim.SGD(grouped_parameters, lr=lr, momentum=0.9, nesterov=True)
scheduler = get_cosine_schedule_with_warmup(optimizer, 0, train_epoch)

train_abmil(
    train_epoch,
    patience,
    early_stopping_warmup,
    eval_every_Xepoch,
    experiment_type,
    experiment_dir,
    weights,
    train_loader,
    val_loader,
```

```
    model,  
    optimizer,  
    scheduler,  
)
```



































```
INFO:__main__:Epoch: 504 | Total Loss: 0.12 | Balanced Accuracy: 0.57
INFO:__main__:Best Balanced Accuracy Seen, validation/test: 0.71 0.59
!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!counter: 1, score: 0.5660784313725491, best_s
core: 0.6429411764705882
INFO:__main__:Epoch: 505 | Total Loss: 0.05 | Balanced Accuracy: 0.56
INFO:__main__:Best Balanced Accuracy Seen, validation/test: 0.71 0.59
!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!counter: 2, score: 0.5622222222222222, best_s
core: 0.6429411764705882
INFO:__main__:Epoch: 506 | Total Loss: 0.04 | Balanced Accuracy: 0.63
INFO:__main__:Best Balanced Accuracy Seen, validation/test: 0.71 0.59
!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!counter: 3, score: 0.6318300653594772, best_s
core: 0.6429411764705882
INFO:__main__:Epoch: 507 | Total Loss: 0.11 | Balanced Accuracy: 0.61
INFO:__main__:Best Balanced Accuracy Seen, validation/test: 0.71 0.59
!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!counter: 4, score: 0.6087581699346405, best_s
core: 0.6429411764705882
INFO:__main__:Epoch: 508 | Total Loss: 0.22 | Balanced Accuracy: 0.63
INFO:__main__:Best Balanced Accuracy Seen, validation/test: 0.71 0.59
!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!counter: 5, score: 0.6259477124183007, best_s
core: 0.6429411764705882
INFO:__main__:Epoch: 509 | Total Loss: 0.15 | Balanced Accuracy: 0.61
INFO:__main__:Best Balanced Accuracy Seen, validation/test: 0.71 0.59
!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!counter: 6, score: 0.6061437908496732, best_s
core: 0.6429411764705882
INFO:__main__:Epoch: 510 | Total Loss: 0.14 | Balanced Accuracy: 0.65
INFO:__main__:Best Balanced Accuracy Seen, validation/test: 0.71 0.59
!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!counter: 0, score: 0.647516339869281, best_sc
ore: 0.647516339869281
INFO:__main__:Epoch: 511 | Total Loss: 0.08 | Balanced Accuracy: 0.66
INFO:__main__:Best Balanced Accuracy Seen, validation/test: 0.71 0.59
!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!counter: 0, score: 0.6624183006535947, best_s
core: 0.6624183006535947
INFO:__main__:Epoch: 512 | Total Loss: 0.07 | Balanced Accuracy: 0.65
INFO:__main__:Best Balanced Accuracy Seen, validation/test: 0.71 0.59
!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!counter: 1, score: 0.648888888888889, best_sc
ore: 0.6624183006535947
INFO:__main__:Epoch: 513 | Total Loss: 0.10 | Balanced Accuracy: 0.60
INFO:__main__:Best Balanced Accuracy Seen, validation/test: 0.71 0.59
!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!counter: 2, score: 0.5993464052287582, best_s
core: 0.6624183006535947
INFO:__main__:Epoch: 514 | Total Loss: 0.08 | Balanced Accuracy: 0.61
INFO:__main__:Best Balanced Accuracy Seen, validation/test: 0.71 0.59
!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!counter: 3, score: 0.6137254901960784, best_s
core: 0.6624183006535947
INFO:__main__:Epoch: 515 | Total Loss: 0.05 | Balanced Accuracy: 0.63
INFO:__main__:Best Balanced Accuracy Seen, validation/test: 0.71 0.59
!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!counter: 4, score: 0.6303267973856209, best_s
core: 0.6624183006535947
INFO:__main__:Epoch: 516 | Total Loss: 0.05 | Balanced Accuracy: 0.64
INFO:__main__:Best Balanced Accuracy Seen, validation/test: 0.71 0.59
!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!counter: 5, score: 0.641437908496732, best_sc
ore: 0.6624183006535947
INFO:__main__:Epoch: 517 | Total Loss: 0.15 | Balanced Accuracy: 0.64
INFO:__main__:Best Balanced Accuracy Seen, validation/test: 0.71 0.59
!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!counter: 6, score: 0.6376470588235295, best_s
core: 0.6624183006535947
```

```
INFO:__main__:Epoch: 518 | Total Loss: 0.08 | Balanced Accuracy: 0.66
INFO:__main__:Best Balanced Accuracy Seen, validation/test: 0.71 0.59
!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!counter: 7, score: 0.6557516339869282, best_s
core: 0.6624183006535947
INFO:__main__:Epoch: 519 | Total Loss: 0.12 | Balanced Accuracy: 0.60
INFO:__main__:Best Balanced Accuracy Seen, validation/test: 0.71 0.59
!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!counter: 8, score: 0.5996732026143791, best_s
core: 0.6624183006535947
INFO:__main__:Epoch: 520 | Total Loss: 0.17 | Balanced Accuracy: 0.63
INFO:__main__:Best Balanced Accuracy Seen, validation/test: 0.71 0.59
!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!counter: 9, score: 0.6282352941176471, best_s
core: 0.6624183006535947
INFO:__main__:Epoch: 521 | Total Loss: 0.06 | Balanced Accuracy: 0.70
INFO:__main__:Best Balanced Accuracy Seen, validation/test: 0.71 0.59
!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!counter: 0, score: 0.6986928104575164, best_s
core: 0.6986928104575164
INFO:__main__:Epoch: 522 | Total Loss: 0.07 | Balanced Accuracy: 0.60
INFO:__main__:Best Balanced Accuracy Seen, validation/test: 0.71 0.59
!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!counter: 1, score: 0.5998692810457517, best_s
core: 0.6986928104575164
INFO:__main__:Epoch: 523 | Total Loss: 0.08 | Balanced Accuracy: 0.58
INFO:__main__:Best Balanced Accuracy Seen, validation/test: 0.71 0.59
!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!counter: 2, score: 0.5756862745098039, best_s
core: 0.6986928104575164
INFO:__main__:Epoch: 524 | Total Loss: 0.12 | Balanced Accuracy: 0.62
INFO:__main__:Best Balanced Accuracy Seen, validation/test: 0.71 0.59
!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!counter: 3, score: 0.6219607843137255, best_s
core: 0.6986928104575164
INFO:__main__:Epoch: 525 | Total Loss: 0.07 | Balanced Accuracy: 0.63
INFO:__main__:Best Balanced Accuracy Seen, validation/test: 0.71 0.59
!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!counter: 4, score: 0.6275816993464053, best_s
core: 0.6986928104575164
INFO:__main__:Epoch: 526 | Total Loss: 0.02 | Balanced Accuracy: 0.64
INFO:__main__:Best Balanced Accuracy Seen, validation/test: 0.71 0.59
!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!counter: 5, score: 0.6437254901960784, best_s
core: 0.6986928104575164
INFO:__main__:Epoch: 527 | Total Loss: 0.02 | Balanced Accuracy: 0.67
INFO:__main__:Best Balanced Accuracy Seen, validation/test: 0.71 0.59
!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!counter: 6, score: 0.6733333333333333, best_s
core: 0.6986928104575164
INFO:__main__:Epoch: 528 | Total Loss: 0.10 | Balanced Accuracy: 0.57
INFO:__main__:Best Balanced Accuracy Seen, validation/test: 0.71 0.59
!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!counter: 7, score: 0.5666666666666668, best_s
core: 0.6986928104575164
INFO:__main__:Epoch: 529 | Total Loss: 0.05 | Balanced Accuracy: 0.61
INFO:__main__:Best Balanced Accuracy Seen, validation/test: 0.71 0.59
!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!counter: 8, score: 0.6127450980392157, best_s
core: 0.6986928104575164
INFO:__main__:Epoch: 530 | Total Loss: 0.05 | Balanced Accuracy: 0.65
INFO:__main__:Best Balanced Accuracy Seen, validation/test: 0.71 0.59
!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!counter: 9, score: 0.6527450980392157, best_s
core: 0.6986928104575164
INFO:__main__:Epoch: 531 | Total Loss: 0.03 | Balanced Accuracy: 0.62
INFO:__main__:Best Balanced Accuracy Seen, validation/test: 0.71 0.59
!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!counter: 10, score: 0.6245751633986928, best_
score: 0.6986928104575164
```

```
INFO:__main__:Epoch: 532 | Total Loss: 0.03 | Balanced Accuracy: 0.65
INFO:__main__:Best Balanced Accuracy Seen, validation/test: 0.71 0.59
!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!counter: 11, score: 0.646797385620915, best_score: 0.6986928104575164
INFO:__main__:Epoch: 533 | Total Loss: 0.02 | Balanced Accuracy: 0.61
INFO:__main__:Best Balanced Accuracy Seen, validation/test: 0.71 0.59
!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!counter: 12, score: 0.614967320261438, best_score: 0.6986928104575164
INFO:__main__:Epoch: 534 | Total Loss: 0.01 | Balanced Accuracy: 0.64
INFO:__main__:Best Balanced Accuracy Seen, validation/test: 0.71 0.59
!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!counter: 13, score: 0.6384967320261438, best_score: 0.6986928104575164
INFO:__main__:Epoch: 535 | Total Loss: 0.13 | Balanced Accuracy: 0.65
INFO:__main__:Best Balanced Accuracy Seen, validation/test: 0.71 0.59
!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!counter: 14, score: 0.6526143790849673, best_score: 0.6986928104575164
INFO:__main__:Epoch: 536 | Total Loss: 0.05 | Balanced Accuracy: 0.60
INFO:__main__:Best Balanced Accuracy Seen, validation/test: 0.71 0.59
!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!counter: 15, score: 0.6005882352941176, best_score: 0.6986928104575164
INFO:__main__:Epoch: 537 | Total Loss: 0.07 | Balanced Accuracy: 0.60
INFO:__main__:Best Balanced Accuracy Seen, validation/test: 0.71 0.59
!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!counter: 16, score: 0.6009150326797386, best_score: 0.6986928104575164
INFO:__main__:Epoch: 538 | Total Loss: 0.06 | Balanced Accuracy: 0.54
INFO:__main__:Best Balanced Accuracy Seen, validation/test: 0.71 0.59
!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!counter: 17, score: 0.5374509803921569, best_score: 0.6986928104575164
INFO:__main__:Epoch: 539 | Total Loss: 0.11 | Balanced Accuracy: 0.56
INFO:__main__:Best Balanced Accuracy Seen, validation/test: 0.71 0.59
!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!counter: 18, score: 0.557124183006536, best_score: 0.6986928104575164
INFO:__main__:Epoch: 540 | Total Loss: 0.04 | Balanced Accuracy: 0.62
INFO:__main__:Best Balanced Accuracy Seen, validation/test: 0.71 0.59
!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!counter: 19, score: 0.6192810457516339, best_score: 0.6986928104575164
INFO:__main__:Epoch: 541 | Total Loss: 0.07 | Balanced Accuracy: 0.62
INFO:__main__:Best Balanced Accuracy Seen, validation/test: 0.71 0.59
!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!counter: 20, score: 0.618562091503268, best_score: 0.6986928104575164
INFO:__main__:Epoch: 542 | Total Loss: 0.14 | Balanced Accuracy: 0.63
INFO:__main__:Best Balanced Accuracy Seen, validation/test: 0.71 0.59
!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!counter: 21, score: 0.6333986928104575, best_score: 0.6986928104575164
INFO:__main__:Epoch: 543 | Total Loss: 0.09 | Balanced Accuracy: 0.62
INFO:__main__:Best Balanced Accuracy Seen, validation/test: 0.71 0.59
!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!counter: 22, score: 0.6198039215686274, best_score: 0.6986928104575164
INFO:__main__:Epoch: 544 | Total Loss: 0.08 | Balanced Accuracy: 0.58
INFO:__main__:Best Balanced Accuracy Seen, validation/test: 0.71 0.59
!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!counter: 23, score: 0.5807843137254902, best_score: 0.6986928104575164
INFO:__main__:Epoch: 545 | Total Loss: 0.08 | Balanced Accuracy: 0.64
INFO:__main__:Best Balanced Accuracy Seen, validation/test: 0.71 0.59
!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!counter: 24, score: 0.6396078431372549, best_score: 0.6986928104575164
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INFO:__main__:Epoch: 546 | Total Loss: 0.03 | Balanced Accuracy: 0.67
INFO:__main__:Best Balanced Accuracy Seen, validation/test: 0.71 0.59
!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!counter: 25, score: 0.6684967320261438, best_
score: 0.6986928104575164
INFO:__main__:Epoch: 547 | Total Loss: 0.07 | Balanced Accuracy: 0.66
INFO:__main__:Best Balanced Accuracy Seen, validation/test: 0.71 0.59
!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!counter: 26, score: 0.656797385620915, best_s
core: 0.6986928104575164
INFO:__main__:Epoch: 548 | Total Loss: 0.09 | Balanced Accuracy: 0.64
INFO:__main__:Best Balanced Accuracy Seen, validation/test: 0.71 0.59
!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!counter: 27, score: 0.6427450980392156, best_
score: 0.6986928104575164
INFO:__main__:Epoch: 549 | Total Loss: 0.04 | Balanced Accuracy: 0.65
INFO:__main__:Best Balanced Accuracy Seen, validation/test: 0.71 0.59
!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!counter: 28, score: 0.6526143790849673, best_
score: 0.6986928104575164
INFO:__main__:Epoch: 550 | Total Loss: 0.08 | Balanced Accuracy: 0.65
INFO:__main__:Best Balanced Accuracy Seen, validation/test: 0.71 0.59
!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!counter: 29, score: 0.645751633986928, best_s
core: 0.6986928104575164
INFO:__main__:Epoch: 551 | Total Loss: 0.10 | Balanced Accuracy: 0.58
INFO:__main__:Best Balanced Accuracy Seen, validation/test: 0.71 0.59
!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!counter: 30, score: 0.5839869281045752, best_
score: 0.6986928104575164
INFO:__main__:Epoch: 552 | Total Loss: 0.05 | Balanced Accuracy: 0.64
INFO:__main__:Best Balanced Accuracy Seen, validation/test: 0.71 0.59
!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!counter: 31, score: 0.6377777777777779, best_
score: 0.6986928104575164
INFO:__main__:Epoch: 553 | Total Loss: 0.09 | Balanced Accuracy: 0.56
INFO:__main__:Best Balanced Accuracy Seen, validation/test: 0.71 0.59
!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!counter: 32, score: 0.5568627450980391, best_
score: 0.6986928104575164
INFO:__main__:Epoch: 554 | Total Loss: 0.08 | Balanced Accuracy: 0.64
INFO:__main__:Best Balanced Accuracy Seen, validation/test: 0.71 0.59
!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!counter: 33, score: 0.6415686274509804, best_
score: 0.6986928104575164
INFO:__main__:Epoch: 555 | Total Loss: 0.05 | Balanced Accuracy: 0.61
INFO:__main__:Best Balanced Accuracy Seen, validation/test: 0.71 0.59
!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!counter: 34, score: 0.6124183006535948, best_
score: 0.6986928104575164
INFO:__main__:Epoch: 556 | Total Loss: 0.03 | Balanced Accuracy: 0.59
INFO:__main__:Best Balanced Accuracy Seen, validation/test: 0.71 0.59
!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!counter: 35, score: 0.5850326797385621, best_
score: 0.6986928104575164
INFO:__main__:Epoch: 557 | Total Loss: 0.04 | Balanced Accuracy: 0.51
INFO:__main__:Best Balanced Accuracy Seen, validation/test: 0.71 0.59
!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!counter: 36, score: 0.5054901960784314, best_
score: 0.6986928104575164
INFO:__main__:Epoch: 558 | Total Loss: 0.04 | Balanced Accuracy: 0.57
INFO:__main__:Best Balanced Accuracy Seen, validation/test: 0.71 0.59
!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!counter: 37, score: 0.5681699346405229, best_
score: 0.6986928104575164
INFO:__main__:Epoch: 559 | Total Loss: 0.03 | Balanced Accuracy: 0.55
INFO:__main__:Best Balanced Accuracy Seen, validation/test: 0.71 0.59
!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!counter: 38, score: 0.5511111111111111, best_
score: 0.6986928104575164
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INFO:__main__:Epoch: 560 | Total Loss: 0.01 | Balanced Accuracy: 0.56
INFO:__main__:Best Balanced Accuracy Seen, validation/test: 0.71 0.59
!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!counter: 39, score: 0.5624183006535948, best_
score: 0.6986928104575164
INFO:__main__:Epoch: 561 | Total Loss: 0.03 | Balanced Accuracy: 0.68
INFO:__main__:Best Balanced Accuracy Seen, validation/test: 0.71 0.59
!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!counter: 40, score: 0.6755555555555556, best_
score: 0.6986928104575164
INFO:__main__:Epoch: 562 | Total Loss: 0.09 | Balanced Accuracy: 0.60
INFO:__main__:Best Balanced Accuracy Seen, validation/test: 0.71 0.59
!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!counter: 41, score: 0.6016339869281045, best_
score: 0.6986928104575164
INFO:__main__:Epoch: 563 | Total Loss: 0.06 | Balanced Accuracy: 0.67
INFO:__main__:Best Balanced Accuracy Seen, validation/test: 0.71 0.59
!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!counter: 42, score: 0.6651633986928105, best_
score: 0.6986928104575164
INFO:__main__:Epoch: 564 | Total Loss: 0.03 | Balanced Accuracy: 0.61
INFO:__main__:Best Balanced Accuracy Seen, validation/test: 0.71 0.59
!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!counter: 43, score: 0.6069934640522876, best_
score: 0.6986928104575164
INFO:__main__:Epoch: 565 | Total Loss: 0.12 | Balanced Accuracy: 0.62
INFO:__main__:Best Balanced Accuracy Seen, validation/test: 0.71 0.59
!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!counter: 44, score: 0.6222222222222222, best_
score: 0.6986928104575164
INFO:__main__:Epoch: 566 | Total Loss: 0.03 | Balanced Accuracy: 0.53
INFO:__main__:Best Balanced Accuracy Seen, validation/test: 0.71 0.59
!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!counter: 45, score: 0.5322875816993464, best_
score: 0.6986928104575164
INFO:__main__:Epoch: 567 | Total Loss: 0.08 | Balanced Accuracy: 0.61
INFO:__main__:Best Balanced Accuracy Seen, validation/test: 0.71 0.59
!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!counter: 46, score: 0.6083660130718954, best_
score: 0.6986928104575164
INFO:__main__:Epoch: 568 | Total Loss: 0.05 | Balanced Accuracy: 0.64
INFO:__main__:Best Balanced Accuracy Seen, validation/test: 0.71 0.59
!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!counter: 47, score: 0.637450980392157, best_
score: 0.6986928104575164
INFO:__main__:Epoch: 569 | Total Loss: 0.02 | Balanced Accuracy: 0.64
INFO:__main__:Best Balanced Accuracy Seen, validation/test: 0.71 0.59
!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!counter: 48, score: 0.637450980392157, best_
score: 0.6986928104575164
INFO:__main__:Epoch: 570 | Total Loss: 0.02 | Balanced Accuracy: 0.61
INFO:__main__:Best Balanced Accuracy Seen, validation/test: 0.71 0.59
!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!counter: 49, score: 0.6087581699346405, best_
score: 0.6986928104575164
INFO:__main__:Epoch: 571 | Total Loss: 0.05 | Balanced Accuracy: 0.60
INFO:__main__:Best Balanced Accuracy Seen, validation/test: 0.71 0.59
!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!counter: 50, score: 0.6044444444444445, best_
score: 0.6986928104575164
INFO:__main__:Epoch: 572 | Total Loss: 0.05 | Balanced Accuracy: 0.62
INFO:__main__:Best Balanced Accuracy Seen, validation/test: 0.71 0.59
!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!counter: 51, score: 0.6178431372549019, best_
score: 0.6986928104575164
INFO:__main__:Epoch: 573 | Total Loss: 0.02 | Balanced Accuracy: 0.70
INFO:__main__:Best Balanced Accuracy Seen, validation/test: 0.71 0.59
!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!counter: 52, score: 0.6979084967320262, best_
score: 0.6986928104575164
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INFO:__main__:Epoch: 574 | Total Loss: 0.05 | Balanced Accuracy: 0.59
INFO:__main__:Best Balanced Accuracy Seen, validation/test: 0.71 0.59
!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!counter: 53, score: 0.5904575163398693, best_
score: 0.6986928104575164
INFO:__main__:Epoch: 575 | Total Loss: 0.02 | Balanced Accuracy: 0.61
INFO:__main__:Best Balanced Accuracy Seen, validation/test: 0.71 0.59
!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!counter: 54, score: 0.6054248366013072, best_
score: 0.6986928104575164
INFO:__main__:Epoch: 576 | Total Loss: 0.07 | Balanced Accuracy: 0.59
INFO:__main__:Best Balanced Accuracy Seen, validation/test: 0.71 0.59
!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!counter: 55, score: 0.5892810457516341, best_
score: 0.6986928104575164
INFO:__main__:Epoch: 577 | Total Loss: 0.03 | Balanced Accuracy: 0.63
INFO:__main__:Best Balanced Accuracy Seen, validation/test: 0.71 0.59
!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!counter: 56, score: 0.6326143790849673, best_
score: 0.6986928104575164
INFO:__main__:Epoch: 578 | Total Loss: 0.02 | Balanced Accuracy: 0.56
INFO:__main__:Best Balanced Accuracy Seen, validation/test: 0.71 0.59
!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!counter: 57, score: 0.5616993464052288, best_
score: 0.6986928104575164
INFO:__main__:Epoch: 579 | Total Loss: 0.03 | Balanced Accuracy: 0.61
INFO:__main__:Best Balanced Accuracy Seen, validation/test: 0.71 0.59
!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!counter: 58, score: 0.612483660130719, best_s
core: 0.6986928104575164
INFO:__main__:Epoch: 580 | Total Loss: 0.05 | Balanced Accuracy: 0.61
INFO:__main__:Best Balanced Accuracy Seen, validation/test: 0.71 0.59
!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!counter: 59, score: 0.6076470588235294, best_
score: 0.6986928104575164
INFO:__main__:Epoch: 581 | Total Loss: 0.01 | Balanced Accuracy: 0.63
INFO:__main__:Best Balanced Accuracy Seen, validation/test: 0.71 0.59
!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!counter: 60, score: 0.6328104575163399, best_
score: 0.6986928104575164
INFO:__main__:Epoch: 582 | Total Loss: 0.02 | Balanced Accuracy: 0.66
INFO:__main__:Best Balanced Accuracy Seen, validation/test: 0.71 0.59
!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!counter: 61, score: 0.657124183006536, best_s
core: 0.6986928104575164
INFO:__main__:Epoch: 583 | Total Loss: 0.35 | Balanced Accuracy: 0.56
INFO:__main__:Best Balanced Accuracy Seen, validation/test: 0.71 0.59
!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!counter: 62, score: 0.5577777777777778, best_
score: 0.6986928104575164
INFO:__main__:Epoch: 584 | Total Loss: 0.28 | Balanced Accuracy: 0.56
INFO:__main__:Best Balanced Accuracy Seen, validation/test: 0.71 0.59
!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!counter: 63, score: 0.5622222222222222, best_
score: 0.6986928104575164
INFO:__main__:Epoch: 585 | Total Loss: 0.06 | Balanced Accuracy: 0.57
INFO:__main__:Best Balanced Accuracy Seen, validation/test: 0.71 0.59
!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!counter: 64, score: 0.5654248366013072, best_
score: 0.6986928104575164
INFO:__main__:Epoch: 586 | Total Loss: 0.09 | Balanced Accuracy: 0.64
INFO:__main__:Best Balanced Accuracy Seen, validation/test: 0.71 0.59
!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!counter: 65, score: 0.6403921568627452, best_
score: 0.6986928104575164
INFO:__main__:Epoch: 587 | Total Loss: 0.05 | Balanced Accuracy: 0.58
INFO:__main__:Best Balanced Accuracy Seen, validation/test: 0.71 0.59
!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!counter: 66, score: 0.5800653594771242, best_
score: 0.6986928104575164
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INFO:__main__:Epoch: 588 | Total Loss: 0.04 | Balanced Accuracy: 0.55
INFO:__main__:Best Balanced Accuracy Seen, validation/test: 0.71 0.59
!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!counter: 67, score: 0.5504575163398693, best_
score: 0.6986928104575164
INFO:__main__:Epoch: 589 | Total Loss: 0.02 | Balanced Accuracy: 0.57
INFO:__main__:Best Balanced Accuracy Seen, validation/test: 0.71 0.59
!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!counter: 68, score: 0.5658169934640523, best_
score: 0.6986928104575164
INFO:__main__:Epoch: 590 | Total Loss: 0.11 | Balanced Accuracy: 0.62
INFO:__main__:Best Balanced Accuracy Seen, validation/test: 0.71 0.59
!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!counter: 69, score: 0.6183006535947713, best_
score: 0.6986928104575164
INFO:__main__:Epoch: 591 | Total Loss: 0.08 | Balanced Accuracy: 0.65
INFO:__main__:Best Balanced Accuracy Seen, validation/test: 0.71 0.59
!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!counter: 70, score: 0.6538562091503267, best_
score: 0.6986928104575164
INFO:__main__:Epoch: 592 | Total Loss: 0.06 | Balanced Accuracy: 0.56
INFO:__main__:Best Balanced Accuracy Seen, validation/test: 0.71 0.59
!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!counter: 71, score: 0.5576470588235295, best_
score: 0.6986928104575164
INFO:__main__:Epoch: 593 | Total Loss: 0.02 | Balanced Accuracy: 0.63
INFO:__main__:Best Balanced Accuracy Seen, validation/test: 0.71 0.59
!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!counter: 72, score: 0.6272549019607844, best_
score: 0.6986928104575164
INFO:__main__:Epoch: 594 | Total Loss: 0.08 | Balanced Accuracy: 0.59
INFO:__main__:Best Balanced Accuracy Seen, validation/test: 0.71 0.59
!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!counter: 73, score: 0.5919607843137255, best_
score: 0.6986928104575164
INFO:__main__:Epoch: 595 | Total Loss: 0.02 | Balanced Accuracy: 0.62
INFO:__main__:Best Balanced Accuracy Seen, validation/test: 0.71 0.59
!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!counter: 74, score: 0.6213725490196079, best_
score: 0.6986928104575164
INFO:__main__:Epoch: 596 | Total Loss: 0.06 | Balanced Accuracy: 0.57
INFO:__main__:Best Balanced Accuracy Seen, validation/test: 0.71 0.59
!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!counter: 75, score: 0.572875816993464, best_s
core: 0.6986928104575164
INFO:__main__:Epoch: 597 | Total Loss: 0.04 | Balanced Accuracy: 0.66
INFO:__main__:Best Balanced Accuracy Seen, validation/test: 0.71 0.59
!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!counter: 76, score: 0.6573856209150327, best_
score: 0.6986928104575164
INFO:__main__:Epoch: 598 | Total Loss: 0.01 | Balanced Accuracy: 0.65
INFO:__main__:Best Balanced Accuracy Seen, validation/test: 0.71 0.59
!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!counter: 77, score: 0.6490849673202614, best_
score: 0.6986928104575164
INFO:__main__:Epoch: 599 | Total Loss: 0.24 | Balanced Accuracy: 0.59
INFO:__main__:Best Balanced Accuracy Seen, validation/test: 0.71 0.59
!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!counter: 78, score: 0.5930718954248366, best_
score: 0.6986928104575164
INFO:__main__:Epoch: 600 | Total Loss: 0.02 | Balanced Accuracy: 0.64
INFO:__main__:Best Balanced Accuracy Seen, validation/test: 0.71 0.59
!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!counter: 79, score: 0.64, best_score: 0.69869
28104575164
INFO:__main__:Epoch: 601 | Total Loss: 0.05 | Balanced Accuracy: 0.59
INFO:__main__:Best Balanced Accuracy Seen, validation/test: 0.71 0.59
!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!counter: 80, score: 0.588562091503268, best_s
core: 0.6986928104575164
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INFO:__main__:Epoch: 602 | Total Loss: 0.03 | Balanced Accuracy: 0.61
INFO:__main__:Best Balanced Accuracy Seen, validation/test: 0.71 0.59
!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!counter: 81, score: 0.6102614379084967, best_
score: 0.6986928104575164
INFO:__main__:Epoch: 603 | Total Loss: 0.01 | Balanced Accuracy: 0.60
INFO:__main__:Best Balanced Accuracy Seen, validation/test: 0.71 0.59
!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!counter: 82, score: 0.5982352941176471, best_
score: 0.6986928104575164
INFO:__main__:Epoch: 604 | Total Loss: 0.06 | Balanced Accuracy: 0.65
INFO:__main__:Best Balanced Accuracy Seen, validation/test: 0.71 0.59
!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!counter: 83, score: 0.6509150326797385, best_
score: 0.6986928104575164
INFO:__main__:Epoch: 605 | Total Loss: 0.01 | Balanced Accuracy: 0.63
INFO:__main__:Best Balanced Accuracy Seen, validation/test: 0.71 0.59
!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!counter: 84, score: 0.6277777777777778, best_
score: 0.6986928104575164
INFO:__main__:Epoch: 606 | Total Loss: 0.06 | Balanced Accuracy: 0.53
INFO:__main__:Best Balanced Accuracy Seen, validation/test: 0.71 0.59
!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!counter: 85, score: 0.5341176470588235, best_
score: 0.6986928104575164
INFO:__main__:Epoch: 607 | Total Loss: 0.15 | Balanced Accuracy: 0.59
INFO:__main__:Best Balanced Accuracy Seen, validation/test: 0.71 0.59
!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!counter: 86, score: 0.5858823529411764, best_
score: 0.6986928104575164
INFO:__main__:Epoch: 608 | Total Loss: 0.04 | Balanced Accuracy: 0.61
INFO:__main__:Best Balanced Accuracy Seen, validation/test: 0.71 0.59
!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!counter: 87, score: 0.6137254901960784, best_
score: 0.6986928104575164
INFO:__main__:Epoch: 609 | Total Loss: 0.07 | Balanced Accuracy: 0.59
INFO:__main__:Best Balanced Accuracy Seen, validation/test: 0.71 0.59
!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!counter: 88, score: 0.5890849673202614, best_
score: 0.6986928104575164
INFO:__main__:Epoch: 610 | Total Loss: 0.01 | Balanced Accuracy: 0.57
INFO:__main__:Best Balanced Accuracy Seen, validation/test: 0.71 0.59
!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!counter: 89, score: 0.5737254901960784, best_
score: 0.6986928104575164
INFO:__main__:Epoch: 611 | Total Loss: 0.06 | Balanced Accuracy: 0.53
INFO:__main__:Best Balanced Accuracy Seen, validation/test: 0.71 0.59
!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!counter: 90, score: 0.5309803921568628, best_
score: 0.6986928104575164
INFO:__main__:Epoch: 612 | Total Loss: 0.02 | Balanced Accuracy: 0.57
INFO:__main__:Best Balanced Accuracy Seen, validation/test: 0.71 0.59
!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!counter: 91, score: 0.5722875816993463, best_
score: 0.6986928104575164
INFO:__main__:Epoch: 613 | Total Loss: 0.01 | Balanced Accuracy: 0.53
INFO:__main__:Best Balanced Accuracy Seen, validation/test: 0.71 0.59
!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!counter: 92, score: 0.5337908496732026, best_
score: 0.6986928104575164
INFO:__main__:Epoch: 614 | Total Loss: 0.03 | Balanced Accuracy: 0.47
INFO:__main__:Best Balanced Accuracy Seen, validation/test: 0.71 0.59
!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!counter: 93, score: 0.46993464052287587, best_
score: 0.6986928104575164
INFO:__main__:Epoch: 615 | Total Loss: 0.10 | Balanced Accuracy: 0.66
INFO:__main__:Best Balanced Accuracy Seen, validation/test: 0.71 0.59
!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!counter: 94, score: 0.660326797385621, best_
score: 0.6986928104575164
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INFO:__main__:Epoch: 616 | Total Loss: 0.04 | Balanced Accuracy: 0.54
INFO:__main__:Best Balanced Accuracy Seen, validation/test: 0.71 0.59
!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!counter: 95, score: 0.5409150326797385, best_
score: 0.6986928104575164
INFO:__main__:Epoch: 617 | Total Loss: 0.12 | Balanced Accuracy: 0.51
INFO:__main__:Best Balanced Accuracy Seen, validation/test: 0.71 0.59
!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!counter: 96, score: 0.5063398692810458, best_
score: 0.6986928104575164
INFO:__main__:Epoch: 618 | Total Loss: 0.12 | Balanced Accuracy: 0.52
INFO:__main__:Best Balanced Accuracy Seen, validation/test: 0.71 0.59
!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!counter: 97, score: 0.521764705882353, best_
score: 0.6986928104575164
INFO:__main__:Epoch: 619 | Total Loss: 0.05 | Balanced Accuracy: 0.53
INFO:__main__:Best Balanced Accuracy Seen, validation/test: 0.71 0.59
!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!counter: 98, score: 0.5330065359477124, best_
score: 0.6986928104575164
INFO:__main__:Epoch: 620 | Total Loss: 0.03 | Balanced Accuracy: 0.51
INFO:__main__:Best Balanced Accuracy Seen, validation/test: 0.71 0.59
!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!counter: 99, score: 0.5127450980392158, best_
score: 0.6986928104575164
INFO:__main__:Epoch: 621 | Total Loss: 0.04 | Balanced Accuracy: 0.50
INFO:__main__:Best Balanced Accuracy Seen, validation/test: 0.71 0.59
!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!counter: 100, score: 0.5006535947712418, best
_score: 0.6986928104575164
INFO:__main__:Epoch: 622 | Total Loss: 0.02 | Balanced Accuracy: 0.54
INFO:__main__:Best Balanced Accuracy Seen, validation/test: 0.71 0.59
!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!counter: 101, score: 0.5448366013071896, best
_score: 0.6986928104575164
INFO:__main__:Epoch: 623 | Total Loss: 0.03 | Balanced Accuracy: 0.52
INFO:__main__:Best Balanced Accuracy Seen, validation/test: 0.71 0.59
!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!counter: 102, score: 0.5179738562091504, best
_score: 0.6986928104575164
INFO:__main__:Epoch: 624 | Total Loss: 0.01 | Balanced Accuracy: 0.56
INFO:__main__:Best Balanced Accuracy Seen, validation/test: 0.71 0.59
!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!counter: 103, score: 0.5558823529411764, best
_score: 0.6986928104575164
INFO:__main__:Epoch: 625 | Total Loss: 0.01 | Balanced Accuracy: 0.56
INFO:__main__:Best Balanced Accuracy Seen, validation/test: 0.71 0.59
!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!counter: 104, score: 0.5627450980392157, best
_score: 0.6986928104575164
INFO:__main__:Epoch: 626 | Total Loss: 0.00 | Balanced Accuracy: 0.57
INFO:__main__:Best Balanced Accuracy Seen, validation/test: 0.71 0.59
!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!counter: 105, score: 0.5688888888888889, best
_score: 0.6986928104575164
INFO:__main__:Epoch: 627 | Total Loss: 0.00 | Balanced Accuracy: 0.56
INFO:__main__:Best Balanced Accuracy Seen, validation/test: 0.71 0.59
!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!counter: 106, score: 0.5564705882352942, best
_score: 0.6986928104575164
INFO:__main__:Epoch: 628 | Total Loss: 0.07 | Balanced Accuracy: 0.51
INFO:__main__:Best Balanced Accuracy Seen, validation/test: 0.71 0.59
!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!counter: 107, score: 0.5141176470588236, best
_score: 0.6986928104575164
INFO:__main__:Epoch: 629 | Total Loss: 0.04 | Balanced Accuracy: 0.63
INFO:__main__:Best Balanced Accuracy Seen, validation/test: 0.71 0.59
!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!counter: 108, score: 0.6298692810457517, best
_score: 0.6986928104575164
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INFO:__main__:Epoch: 630 | Total Loss: 0.04 | Balanced Accuracy: 0.64
INFO:__main__:Best Balanced Accuracy Seen, validation/test: 0.71 0.59
!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!counter: 109, score: 0.6357516339869281, best
_score: 0.6986928104575164
INFO:__main__:Epoch: 631 | Total Loss: 0.08 | Balanced Accuracy: 0.56
INFO:__main__:Best Balanced Accuracy Seen, validation/test: 0.71 0.59
!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!counter: 110, score: 0.557843137254902, best_
score: 0.6986928104575164
INFO:__main__:Epoch: 632 | Total Loss: 0.02 | Balanced Accuracy: 0.54
INFO:__main__:Best Balanced Accuracy Seen, validation/test: 0.71 0.59
!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!counter: 111, score: 0.5361437908496732, best
_score: 0.6986928104575164
INFO:__main__:Epoch: 633 | Total Loss: 0.09 | Balanced Accuracy: 0.62
INFO:__main__:Best Balanced Accuracy Seen, validation/test: 0.71 0.59
!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!counter: 112, score: 0.6237254901960784, best
_score: 0.6986928104575164
INFO:__main__:Epoch: 634 | Total Loss: 0.04 | Balanced Accuracy: 0.58
INFO:__main__:Best Balanced Accuracy Seen, validation/test: 0.71 0.59
!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!counter: 113, score: 0.5818300653594771, best
_score: 0.6986928104575164
INFO:__main__:Epoch: 635 | Total Loss: 0.01 | Balanced Accuracy: 0.59
INFO:__main__:Best Balanced Accuracy Seen, validation/test: 0.71 0.59
!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!counter: 114, score: 0.5873856209150327, best
_score: 0.6986928104575164
INFO:__main__:Epoch: 636 | Total Loss: 0.01 | Balanced Accuracy: 0.60
INFO:__main__:Best Balanced Accuracy Seen, validation/test: 0.71 0.59
!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!counter: 115, score: 0.6, best_score: 0.69869
28104575164
INFO:__main__:Epoch: 637 | Total Loss: 0.09 | Balanced Accuracy: 0.55
INFO:__main__:Best Balanced Accuracy Seen, validation/test: 0.71 0.59
!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!counter: 116, score: 0.545751633986928, best_
score: 0.6986928104575164
INFO:__main__:Epoch: 638 | Total Loss: 0.07 | Balanced Accuracy: 0.54
INFO:__main__:Best Balanced Accuracy Seen, validation/test: 0.71 0.59
!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!counter: 117, score: 0.5352287581699345, best
_score: 0.6986928104575164
INFO:__main__:Epoch: 639 | Total Loss: 0.03 | Balanced Accuracy: 0.47
INFO:__main__:Best Balanced Accuracy Seen, validation/test: 0.71 0.59
!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!counter: 118, score: 0.4697385620915033, best
_score: 0.6986928104575164
INFO:__main__:Epoch: 640 | Total Loss: 0.05 | Balanced Accuracy: 0.57
INFO:__main__:Best Balanced Accuracy Seen, validation/test: 0.71 0.59
!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!counter: 119, score: 0.5667320261437908, best
_score: 0.6986928104575164
INFO:__main__:Epoch: 641 | Total Loss: 0.02 | Balanced Accuracy: 0.56
INFO:__main__:Best Balanced Accuracy Seen, validation/test: 0.71 0.59
!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!counter: 120, score: 0.5630718954248366, best
_score: 0.6986928104575164
INFO:__main__:Epoch: 642 | Total Loss: 0.05 | Balanced Accuracy: 0.61
INFO:__main__:Best Balanced Accuracy Seen, validation/test: 0.71 0.59
!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!counter: 121, score: 0.610718954248366, best_
score: 0.6986928104575164
INFO:__main__:Epoch: 643 | Total Loss: 0.03 | Balanced Accuracy: 0.60
INFO:__main__:Best Balanced Accuracy Seen, validation/test: 0.71 0.59
!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!counter: 122, score: 0.604640522875817, best_
score: 0.6986928104575164
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INFO:__main__:Epoch: 644 | Total Loss: 0.01 | Balanced Accuracy: 0.59
INFO:__main__:Best Balanced Accuracy Seen, validation/test: 0.71 0.59
!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!counter: 123, score: 0.593333333333334, best
_score: 0.6986928104575164
INFO:__main__:Epoch: 645 | Total Loss: 0.03 | Balanced Accuracy: 0.60
INFO:__main__:Best Balanced Accuracy Seen, validation/test: 0.71 0.59
!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!counter: 124, score: 0.5998039215686274, best
_score: 0.6986928104575164
INFO:__main__:Epoch: 646 | Total Loss: 0.01 | Balanced Accuracy: 0.60
INFO:__main__:Best Balanced Accuracy Seen, validation/test: 0.71 0.59
!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!counter: 125, score: 0.5998039215686274, best
_score: 0.6986928104575164
INFO:__main__:Epoch: 647 | Total Loss: 0.02 | Balanced Accuracy: 0.61
INFO:__main__:Best Balanced Accuracy Seen, validation/test: 0.71 0.59
!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!counter: 126, score: 0.6083006535947714, best
_score: 0.6986928104575164
INFO:__main__:Epoch: 648 | Total Loss: 0.02 | Balanced Accuracy: 0.55
INFO:__main__:Best Balanced Accuracy Seen, validation/test: 0.71 0.59
!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!counter: 127, score: 0.5515032679738562, best
_score: 0.6986928104575164
INFO:__main__:Epoch: 649 | Total Loss: 0.02 | Balanced Accuracy: 0.65
INFO:__main__:Best Balanced Accuracy Seen, validation/test: 0.71 0.59
!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!counter: 128, score: 0.6479084967320262, best
_score: 0.6986928104575164
INFO:__main__:Epoch: 650 | Total Loss: 0.05 | Balanced Accuracy: 0.55
INFO:__main__:Best Balanced Accuracy Seen, validation/test: 0.71 0.59
!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!counter: 129, score: 0.548562091503268, best_
score: 0.6986928104575164
INFO:__main__:Epoch: 651 | Total Loss: 0.01 | Balanced Accuracy: 0.61
INFO:__main__:Best Balanced Accuracy Seen, validation/test: 0.71 0.59
!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!counter: 130, score: 0.6081699346405228, best
_score: 0.6986928104575164
INFO:__main__:Epoch: 652 | Total Loss: 0.05 | Balanced Accuracy: 0.60
INFO:__main__:Best Balanced Accuracy Seen, validation/test: 0.71 0.59
!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!counter: 131, score: 0.6009150326797386, best
_score: 0.6986928104575164
INFO:__main__:Epoch: 653 | Total Loss: 0.02 | Balanced Accuracy: 0.62
INFO:__main__:Best Balanced Accuracy Seen, validation/test: 0.71 0.59
!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!counter: 132, score: 0.6175816993464053, best
_score: 0.6986928104575164
INFO:__main__:Epoch: 654 | Total Loss: 0.02 | Balanced Accuracy: 0.60
INFO:__main__:Best Balanced Accuracy Seen, validation/test: 0.71 0.59
!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!counter: 133, score: 0.5998039215686274, best
_score: 0.6986928104575164
INFO:__main__:Epoch: 655 | Total Loss: 0.04 | Balanced Accuracy: 0.61
INFO:__main__:Best Balanced Accuracy Seen, validation/test: 0.71 0.59
!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!counter: 134, score: 0.6138562091503269, best
_score: 0.6986928104575164
INFO:__main__:Epoch: 656 | Total Loss: 0.03 | Balanced Accuracy: 0.57
INFO:__main__:Best Balanced Accuracy Seen, validation/test: 0.71 0.59
!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!counter: 135, score: 0.573529411764706, best_
score: 0.6986928104575164
INFO:__main__:Epoch: 657 | Total Loss: 0.02 | Balanced Accuracy: 0.58
INFO:__main__:Best Balanced Accuracy Seen, validation/test: 0.71 0.59
!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!counter: 136, score: 0.5798692810457516, best
_score: 0.6986928104575164
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INFO:__main__:Epoch: 658 | Total Loss: 0.00 | Balanced Accuracy: 0.56
INFO:__main__:Best Balanced Accuracy Seen, validation/test: 0.71 0.59
!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!counter: 137, score: 0.5574509803921569, best
_score: 0.6986928104575164
INFO:__main__:Epoch: 659 | Total Loss: 0.12 | Balanced Accuracy: 0.62
INFO:__main__:Best Balanced Accuracy Seen, validation/test: 0.71 0.59
!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!counter: 138, score: 0.6183006535947713, best
_score: 0.6986928104575164
INFO:__main__:Epoch: 660 | Total Loss: 0.07 | Balanced Accuracy: 0.63
INFO:__main__:Best Balanced Accuracy Seen, validation/test: 0.71 0.59
!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!counter: 139, score: 0.6305882352941177, best
_score: 0.6986928104575164
INFO:__main__:Epoch: 661 | Total Loss: 0.01 | Balanced Accuracy: 0.61
INFO:__main__:Best Balanced Accuracy Seen, validation/test: 0.71 0.59
!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!counter: 140, score: 0.6115032679738562, best
_score: 0.6986928104575164
INFO:__main__:Epoch: 662 | Total Loss: 0.07 | Balanced Accuracy: 0.69
INFO:__main__:Best Balanced Accuracy Seen, validation/test: 0.71 0.59
!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!counter: 141, score: 0.6866666666666666, best
_score: 0.6986928104575164
INFO:__main__:Epoch: 663 | Total Loss: 0.04 | Balanced Accuracy: 0.62
INFO:__main__:Best Balanced Accuracy Seen, validation/test: 0.71 0.59
!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!counter: 142, score: 0.6177124183006536, best
_score: 0.6986928104575164
INFO:__main__:Epoch: 664 | Total Loss: 0.05 | Balanced Accuracy: 0.66
INFO:__main__:Best Balanced Accuracy Seen, validation/test: 0.71 0.59
!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!counter: 143, score: 0.6572549019607844, best
_score: 0.6986928104575164
INFO:__main__:Epoch: 665 | Total Loss: 0.02 | Balanced Accuracy: 0.63
INFO:__main__:Best Balanced Accuracy Seen, validation/test: 0.71 0.59
!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!counter: 144, score: 0.6310457516339869, best
_score: 0.6986928104575164
INFO:__main__:Epoch: 666 | Total Loss: 0.08 | Balanced Accuracy: 0.64
INFO:__main__:Best Balanced Accuracy Seen, validation/test: 0.71 0.59
!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!counter: 145, score: 0.6397385620915034, best
_score: 0.6986928104575164
INFO:__main__:Epoch: 667 | Total Loss: 0.02 | Balanced Accuracy: 0.66
INFO:__main__:Best Balanced Accuracy Seen, validation/test: 0.71 0.59
!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!counter: 146, score: 0.6592156862745098, best
_score: 0.6986928104575164
INFO:__main__:Epoch: 668 | Total Loss: 0.00 | Balanced Accuracy: 0.65
INFO:__main__:Best Balanced Accuracy Seen, validation/test: 0.71 0.59
!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!counter: 147, score: 0.6484967320261438, best
_score: 0.6986928104575164
INFO:__main__:Epoch: 669 | Total Loss: 0.02 | Balanced Accuracy: 0.62
INFO:__main__:Best Balanced Accuracy Seen, validation/test: 0.71 0.59
!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!counter: 148, score: 0.6216339869281047, best
_score: 0.6986928104575164
INFO:__main__:Epoch: 670 | Total Loss: 0.04 | Balanced Accuracy: 0.65
INFO:__main__:Best Balanced Accuracy Seen, validation/test: 0.71 0.59
!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!counter: 149, score: 0.6456862745098039, best
_score: 0.6986928104575164
INFO:__main__:Epoch: 671 | Total Loss: 0.02 | Balanced Accuracy: 0.66
INFO:__main__:Best Balanced Accuracy Seen, validation/test: 0.71 0.59
!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!counter: 150, score: 0.6647712418300654, best
_score: 0.6986928104575164
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INFO:__main__:Epoch: 672 | Total Loss: 0.01 | Balanced Accuracy: 0.64
INFO:__main__:Best Balanced Accuracy Seen, validation/test: 0.71 0.59
!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!counter: 151, score: 0.6436601307189543, best
_score: 0.6986928104575164
INFO:__main__:Epoch: 673 | Total Loss: 0.01 | Balanced Accuracy: 0.63
INFO:__main__:Best Balanced Accuracy Seen, validation/test: 0.71 0.59
!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!counter: 152, score: 0.6269934640522877, best
_score: 0.6986928104575164
INFO:__main__:Epoch: 674 | Total Loss: 0.00 | Balanced Accuracy: 0.62
INFO:__main__:Best Balanced Accuracy Seen, validation/test: 0.71 0.59
!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!counter: 153, score: 0.6192156862745098, best
_score: 0.6986928104575164
INFO:__main__:Epoch: 675 | Total Loss: 0.00 | Balanced Accuracy: 0.62
INFO:__main__:Best Balanced Accuracy Seen, validation/test: 0.71 0.59
!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!counter: 154, score: 0.6247712418300654, best
_score: 0.6986928104575164
INFO:__main__:Epoch: 676 | Total Loss: 0.00 | Balanced Accuracy: 0.63
INFO:__main__:Best Balanced Accuracy Seen, validation/test: 0.71 0.59
!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!counter: 155, score: 0.6277124183006536, best
_score: 0.6986928104575164
INFO:__main__:Epoch: 677 | Total Loss: 0.06 | Balanced Accuracy: 0.64
INFO:__main__:Best Balanced Accuracy Seen, validation/test: 0.71 0.59
!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!counter: 156, score: 0.643333333333334, best
_score: 0.6986928104575164
INFO:__main__:Epoch: 678 | Total Loss: 0.00 | Balanced Accuracy: 0.65
INFO:__main__:Best Balanced Accuracy Seen, validation/test: 0.71 0.59
!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!counter: 157, score: 0.6531372549019608, best
_score: 0.6986928104575164
INFO:__main__:Epoch: 679 | Total Loss: 0.02 | Balanced Accuracy: 0.65
INFO:__main__:Best Balanced Accuracy Seen, validation/test: 0.71 0.59
!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!counter: 158, score: 0.6531372549019608, best
_score: 0.6986928104575164
INFO:__main__:Epoch: 680 | Total Loss: 0.00 | Balanced Accuracy: 0.68
INFO:__main__:Best Balanced Accuracy Seen, validation/test: 0.71 0.59
!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!counter: 159, score: 0.6775816993464052, best
_score: 0.6986928104575164
INFO:__main__:Epoch: 681 | Total Loss: 0.03 | Balanced Accuracy: 0.62
INFO:__main__:Best Balanced Accuracy Seen, validation/test: 0.71 0.59
!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!counter: 160, score: 0.6222222222222222, best
_score: 0.6986928104575164
INFO:__main__:Epoch: 682 | Total Loss: 0.04 | Balanced Accuracy: 0.66
INFO:__main__:Best Balanced Accuracy Seen, validation/test: 0.71 0.59
!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!counter: 161, score: 0.6624183006535947, best
_score: 0.6986928104575164
INFO:__main__:Epoch: 683 | Total Loss: 0.01 | Balanced Accuracy: 0.59
INFO:__main__:Best Balanced Accuracy Seen, validation/test: 0.71 0.59
!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!counter: 162, score: 0.594640522875817, best_
score: 0.6986928104575164
INFO:__main__:Epoch: 684 | Total Loss: 0.07 | Balanced Accuracy: 0.68
INFO:__main__:Best Balanced Accuracy Seen, validation/test: 0.71 0.59
!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!counter: 163, score: 0.6834640522875818, best
_score: 0.6986928104575164
INFO:__main__:Epoch: 685 | Total Loss: 0.03 | Balanced Accuracy: 0.53
INFO:__main__:Best Balanced Accuracy Seen, validation/test: 0.71 0.59
!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!counter: 164, score: 0.5273856209150326, best
_score: 0.6986928104575164
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INFO:__main__:Epoch: 686 | Total Loss: 0.01 | Balanced Accuracy: 0.70
INFO:__main__:Best Balanced Accuracy Seen, validation/test: 0.71 0.59
!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!counter: 165, score: 0.6958823529411765, best
_score: 0.6986928104575164
INFO:__main__:Epoch: 687 | Total Loss: 0.01 | Balanced Accuracy: 0.69
INFO:__main__:Best Balanced Accuracy Seen, validation/test: 0.71 0.59
!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!counter: 166, score: 0.6938562091503268, best
_score: 0.6986928104575164
INFO:__main__:Epoch: 688 | Total Loss: 0.01 | Balanced Accuracy: 0.58
INFO:__main__:Best Balanced Accuracy Seen, validation/test: 0.71 0.59
!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!counter: 167, score: 0.5751633986928105, best
_score: 0.6986928104575164
INFO:__main__:Epoch: 689 | Total Loss: 0.00 | Balanced Accuracy: 0.69
INFO:__main__:Best Balanced Accuracy Seen, validation/test: 0.71 0.59
!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!counter: 168, score: 0.6922222222222222, best
_score: 0.6986928104575164
INFO:__main__:Epoch: 690 | Total Loss: 0.00 | Balanced Accuracy: 0.68
INFO:__main__:Best Balanced Accuracy Seen, validation/test: 0.71 0.59
!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!counter: 169, score: 0.6752941176470588, best
_score: 0.6986928104575164
INFO:__main__:Epoch: 691 | Total Loss: 0.00 | Balanced Accuracy: 0.69
INFO:__main__:Best Balanced Accuracy Seen, validation/test: 0.71 0.59
!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!counter: 170, score: 0.6903267973856209, best
_score: 0.6986928104575164
INFO:__main__:Epoch: 692 | Total Loss: 0.02 | Balanced Accuracy: 0.69
INFO:__main__:Best Balanced Accuracy Seen, validation/test: 0.71 0.59
!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!counter: 171, score: 0.6929411764705883, best
_score: 0.6986928104575164
INFO:__main__:Epoch: 693 | Total Loss: 0.01 | Balanced Accuracy: 0.67
INFO:__main__:Best Balanced Accuracy Seen, validation/test: 0.71 0.59
!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!counter: 172, score: 0.6666013071895425, best
_score: 0.6986928104575164
INFO:__main__:Epoch: 694 | Total Loss: 0.01 | Balanced Accuracy: 0.57
INFO:__main__:Best Balanced Accuracy Seen, validation/test: 0.71 0.59
!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!counter: 173, score: 0.5651633986928105, best
_score: 0.6986928104575164
INFO:__main__:Epoch: 695 | Total Loss: 0.02 | Balanced Accuracy: 0.63
INFO:__main__:Best Balanced Accuracy Seen, validation/test: 0.71 0.59
!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!counter: 174, score: 0.6264705882352941, best
_score: 0.6986928104575164
INFO:__main__:Epoch: 696 | Total Loss: 0.03 | Balanced Accuracy: 0.65
INFO:__main__:Best Balanced Accuracy Seen, validation/test: 0.71 0.59
!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!counter: 175, score: 0.6475816993464053, best
_score: 0.6986928104575164
INFO:__main__:Epoch: 697 | Total Loss: 0.01 | Balanced Accuracy: 0.67
INFO:__main__:Best Balanced Accuracy Seen, validation/test: 0.71 0.59
!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!counter: 176, score: 0.6703921568627451, best
_score: 0.6986928104575164
INFO:__main__:Epoch: 698 | Total Loss: 0.00 | Balanced Accuracy: 0.66
INFO:__main__:Best Balanced Accuracy Seen, validation/test: 0.71 0.59
!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!counter: 177, score: 0.6586928104575164, best
_score: 0.6986928104575164
INFO:__main__:Epoch: 699 | Total Loss: 0.00 | Balanced Accuracy: 0.66
INFO:__main__:Best Balanced Accuracy Seen, validation/test: 0.71 0.59
!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!counter: 178, score: 0.66, best_score: 0.6986
928104575164
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INFO:__main__:Epoch: 700 | Total Loss: 0.06 | Balanced Accuracy: 0.65
INFO:__main__:Best Balanced Accuracy Seen, validation/test: 0.71 0.59
!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!counter: 179, score: 0.650718954248366, best_
score: 0.6986928104575164
INFO:__main__:Epoch: 701 | Total Loss: 0.02 | Balanced Accuracy: 0.63
INFO:__main__:Best Balanced Accuracy Seen, validation/test: 0.71 0.59
!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!counter: 180, score: 0.6341176470588236, best
_score: 0.6986928104575164
INFO:__main__:Epoch: 702 | Total Loss: 0.01 | Balanced Accuracy: 0.64
INFO:__main__:Best Balanced Accuracy Seen, validation/test: 0.71 0.59
!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!counter: 181, score: 0.6386928104575164, best
_score: 0.6986928104575164
INFO:__main__:Epoch: 703 | Total Loss: 0.02 | Balanced Accuracy: 0.68
INFO:__main__:Best Balanced Accuracy Seen, validation/test: 0.71 0.59
!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!counter: 182, score: 0.67718954248366, best_s
core: 0.6986928104575164
INFO:__main__:Epoch: 704 | Total Loss: 0.00 | Balanced Accuracy: 0.66
INFO:__main__:Best Balanced Accuracy Seen, validation/test: 0.71 0.59
!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!counter: 183, score: 0.6644444444444444, best
_score: 0.6986928104575164
INFO:__main__:Epoch: 705 | Total Loss: 0.00 | Balanced Accuracy: 0.68
INFO:__main__:Best Balanced Accuracy Seen, validation/test: 0.71 0.59
!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!counter: 184, score: 0.6792156862745098, best
_score: 0.6986928104575164
INFO:__main__:Epoch: 706 | Total Loss: 0.00 | Balanced Accuracy: 0.67
INFO:__main__:Best Balanced Accuracy Seen, validation/test: 0.71 0.59
!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!counter: 185, score: 0.670718954248366, best_
score: 0.6986928104575164
INFO:__main__:Epoch: 707 | Total Loss: 0.01 | Balanced Accuracy: 0.68
INFO:__main__:Best Balanced Accuracy Seen, validation/test: 0.71 0.59
!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!counter: 186, score: 0.6766013071895425, best
_score: 0.6986928104575164
INFO:__main__:Epoch: 708 | Total Loss: 0.03 | Balanced Accuracy: 0.65
INFO:__main__:Best Balanced Accuracy Seen, validation/test: 0.71 0.59
!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!counter: 187, score: 0.6534640522875818, best
_score: 0.6986928104575164
INFO:__main__:Epoch: 709 | Total Loss: 0.02 | Balanced Accuracy: 0.67
INFO:__main__:Best Balanced Accuracy Seen, validation/test: 0.71 0.59
!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!counter: 188, score: 0.6688235294117647, best
_score: 0.6986928104575164
INFO:__main__:Epoch: 710 | Total Loss: 0.01 | Balanced Accuracy: 0.59
INFO:__main__:Best Balanced Accuracy Seen, validation/test: 0.71 0.59
!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!counter: 189, score: 0.5928104575163399, best
_score: 0.6986928104575164
INFO:__main__:Epoch: 711 | Total Loss: 0.00 | Balanced Accuracy: 0.62
INFO:__main__:Best Balanced Accuracy Seen, validation/test: 0.71 0.59
!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!counter: 190, score: 0.6230065359477125, best
_score: 0.6986928104575164
INFO:__main__:Epoch: 712 | Total Loss: 0.00 | Balanced Accuracy: 0.64
INFO:__main__:Best Balanced Accuracy Seen, validation/test: 0.71 0.59
!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!counter: 191, score: 0.6426143790849673, best
_score: 0.6986928104575164
INFO:__main__:Epoch: 713 | Total Loss: 0.00 | Balanced Accuracy: 0.63
INFO:__main__:Best Balanced Accuracy Seen, validation/test: 0.71 0.59
!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!counter: 192, score: 0.6335294117647059, best
_score: 0.6986928104575164
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INFO:__main__:Epoch: 714 | Total Loss: 0.00 | Balanced Accuracy: 0.61
INFO:__main__:Best Balanced Accuracy Seen, validation/test: 0.71 0.59
!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!counter: 193, score: 0.6132026143790851, best
_score: 0.6986928104575164
INFO:__main__:Epoch: 715 | Total Loss: 0.00 | Balanced Accuracy: 0.66
INFO:__main__:Best Balanced Accuracy Seen, validation/test: 0.71 0.59
!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!counter: 194, score: 0.6623529411764706, best
_score: 0.6986928104575164
INFO:__main__:Epoch: 716 | Total Loss: 0.00 | Balanced Accuracy: 0.66
INFO:__main__:Best Balanced Accuracy Seen, validation/test: 0.71 0.59
!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!counter: 195, score: 0.6607843137254902, best
_score: 0.6986928104575164
INFO:__main__:Epoch: 717 | Total Loss: 0.00 | Balanced Accuracy: 0.69
INFO:__main__:Best Balanced Accuracy Seen, validation/test: 0.71 0.59
!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!counter: 196, score: 0.6875816993464053, best
_score: 0.6986928104575164
INFO:__main__:Epoch: 718 | Total Loss: 0.00 | Balanced Accuracy: 0.67
INFO:__main__:Best Balanced Accuracy Seen, validation/test: 0.71 0.59
!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!counter: 197, score: 0.6721568627450981, best
_score: 0.6986928104575164
INFO:__main__:Epoch: 719 | Total Loss: 0.09 | Balanced Accuracy: 0.63
INFO:__main__:Best Balanced Accuracy Seen, validation/test: 0.71 0.59
!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!counter: 198, score: 0.6275163398692811, best
_score: 0.6986928104575164
INFO:__main__:Epoch: 720 | Total Loss: 0.02 | Balanced Accuracy: 0.67
INFO:__main__:Best Balanced Accuracy Seen, validation/test: 0.71 0.59
!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!counter: 199, score: 0.6694117647058823, best
_score: 0.6986928104575164
INFO:__main__:Epoch: 721 | Total Loss: 0.00 | Balanced Accuracy: 0.69
INFO:__main__:Best Balanced Accuracy Seen, validation/test: 0.71 0.59
!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!counter: 200, score: 0.6896078431372549, best
_score: 0.6986928104575164
```

## Evaluation

### SAMIL

#### Bag-Level (Study Level) Pre Training

The reproduction of the SAMIL model with Study Level Pretraining was trained for 446 epochs before Colab terminated the A100 GPU runtime. At that time, the best balanced accuracy achieved was 0.663 vs. the paper's 0.754. We will continue training from the checkpoint once a more stable environment has been chosen.

The code block below compares the balanced accuracy of the SAMIL with Study Level Pre Training from the checkpoint file captured during training by downloading the checkpoint from Google Drive on a publicly available link using `gdown`.

```
In [ ]: target_balanced_accuracy = 0.754
```

```
# Downloads model checkpoint from our public Google Drive link
!gdown 'https://drive.google.com/uc?id=1-860ddmCB0_Kq8EI0-DLfHEi0yB-4K0w'
```

```
Downloading...
From: https://drive.google.com/uc?id=1-860ddmCB0_Kq8EI0-DLfHEi0yB-4K0w
To: /content/best_samil_StudyLevel_model.pth.tar
100% 9.26M/9.26M [00:00<00:00, 16.7MB/s]
```

```
In [ ]: model_checkpoint = os.path.join('', 'best_samil_StudyLevel_model.pth.tar')
checkpoint = torch.load(model_checkpoint)

model = SAMIL().to(device)
model.load_state_dict(torch.load(model_checkpoint))

model.eval()

test_loader = DataLoader(test_dataset, batch_size=1, shuffle=False, num_workers=8)
repro_balanced_accuracy_score = eval_model(test_loader, model, 2000)

print(f"Target Balanced Accuracy (from paper): {target_balanced_accuracy}")
print(f"Reproduced Balanced Accuracy (from repro): {repro_balanced_accuracy_score}")

Target Balanced Accuracy (from paper): 0.754
Reproduced Balanced Accuracy (from repro): 0.7408748114630468
```

## Image-Level Pretraining

```
In [ ]: target_balanced_accuracy = 0.712

# Downloads model checkpoint from our public Google Drive link
!gdown 'https://drive.google.com/uc?id=166uyrtMb0joJA3ETVG0sF50IHRDZTTy3'

Downloading...
From: https://drive.google.com/uc?id=166uyrtMb0joJA3ETVG0sF50IHRDZTTy3
To: /content/best_samil_ImageLevel_model.pth.tar
100% 9.26M/9.26M [00:00<00:00, 104MB/s]

In [ ]: model_checkpoint = os.path.join('', 'best_samil_ImageLevel_model.pth.tar')
checkpoint = torch.load(model_checkpoint)

model = SAMIL().to(device)
model.load_state_dict(torch.load(model_checkpoint))

model.eval()

test_loader = DataLoader(test_dataset, batch_size=1, shuffle=False, num_workers=8)
repro_balanced_accuracy_score = eval_model(test_loader, model, 2000)

print(f"Target Balanced Accuracy (from paper): {target_balanced_accuracy}")
print(f"Reproduced Balanced Accuracy (from repro): {repro_balanced_accuracy_score}")

Target Balanced Accuracy (from paper): 0.712
Reproduced Balanced Accuracy (from repro): 0.7519859225741579
```

## No Pretraining

```
In [ ]: target_balanced_accuracy = 0.727

# Downloads model checkpoint from our public Google Drive link
!gdown 'https://drive.google.com/uc?id=1-BYHiZ7iefhI9xI2TNt3Egnk2rjrJdAq'
```

```
Downloading...
From: https://drive.google.com/uc?id=1-BYHiZ7iefhI9xI2TNt3Egnk2rjrJdAq
To: /content/best_samil_NoPretrain_model.pth.tar
100% 9.26M/9.26M [00:00<00:00, 136MB/s]
```

```
In [ ]: model_checkpoint = os.path.join('', 'best_samil_NoPretrain_model.pth.tar')
checkpoint = torch.load(model_checkpoint)

model = SAMIL().to(device)
model.load_state_dict(torch.load(model_checkpoint))

model.eval()

test_loader = DataLoader(test_dataset, batch_size=1, shuffle=False, num_workers=8)
repro_balanced_accuracy_score = eval_model(test_loader, model, 2000)

print(f"Target Balanced Accuracy (from paper): {target_balanced_accuracy}")
print(f"Reproduced Balanced Accuracy (from repro): {repro_balanced_accuracy_score}")

Target Balanced Accuracy (from paper): 0.727
Reproduced Balanced Accuracy (from repro): 0.7050276520864757
```

## ABMIL

```
In [ ]: target_balanced_accuracy = 0.585

# Downloads model checkpoint from our public Google Drive link
!gdown 'https://drive.google.com/uc?id=1-HQQIBXXPrKh7N8kobyPJe5FQ80v6v02'

Downloading...
From: https://drive.google.com/uc?id=1-HQQIBXXPrKh7N8kobyPJe5FQ80v6v02
To: /content/best_ABMIL_model.pth.tar
100% 9.00M/9.00M [00:00<00:00, 112MB/s]

In [ ]: model_checkpoint = os.path.join('', 'best_ABMIL_model.pth.tar')
checkpoint = torch.load(model_checkpoint)

model = Attention().to(device)
model.load_state_dict(torch.load(model_checkpoint))

model.eval()

test_loader = DataLoader(test_dataset, batch_size=1, shuffle=False, num_workers=8)
repro_balanced_accuracy_score = eval_model(test_loader, model, 2000)

print(f"Target Balanced Accuracy (from paper): {target_balanced_accuracy}")
print(f"Reproduced Balanced Accuracy (from repro): {repro_balanced_accuracy_score}")

Target Balanced Accuracy (from paper): 0.585
Reproduced Balanced Accuracy (from repro): 0.5935897435897436
```

## Results

The following results were reproduced for each model/ablation. The "Paper Balanced Accuracy" column represents the balanced accuracy for Split 1 reported by the authors in the paper.

Model	Reproduced Balanced Accuracy	Paper Balanced Accuracy
ABMIL	59.4	58.5
SAMIL w/ No Pretraining	70.5	72.7
SAMIL w/ Image-Level Pretraining	75.2	71.2
SAMIL w/ Study-Level Pretraining	74.1	75.4

# Analysis

## Overview

In general, the results are fairly close to the paper's results for Split 1. The novel piece of the paper is the ~12% improvement to ABMIL, which is the current "state of the art" model. We find this hypothesis to be valid, as SAMIL w/ Study Level Pretraining produced a Balanced Accuracy score of 74.1% vs. 59.4% for ABMIL.

The primary model, SAMIL with Study Level Pretraining came in at -130 bps to target for the Balanced Accuracy score.

Three ablations were also conducted that matched the ablations outlined in the paper: a) ABMIL, b) SAMIL without pretraining, and c) SAMIL with image level pretraining (instead of study level).

For Abalation A (ABMIL), the reproduction came in +90 bps to target for Balanced Accuracy. Abalation B (SAMIL, No Pretraining) was -220 bps to target, and lastly Ablation C (SAMIL, Image Level Pretraining) was +400 bps to target.

The most interesting outcome of this reproduction is the outperformance of SAMIL with Study Level Pretraining by SAMIL with Image Level Pretraining by +100 bps. In the paper, the authors see outperformance of SAMIL with Study Level pretraining over SAMIL with Image Level pretraining in all three splits. We are unsure of the reason behind this, and additional training runs across all the SAMIL models would a good next steps to ensure this was not simply anomaly. The authors of the paper claim that image level pretraining was "not beneficial" and in some cases "slightly harmful" as the model attempts to learn good image representations vs. the "bag level" representations (a set of images). One hypothesis is the dataset is simply too small -- resulting in a high level of variance in results and the reproducibility of the paper's results for image level vs. bag level to be challenging. Another hypothesis in the variation is the removal of the Exponential Moving Average Model (ModelEMA) mechanism in an effort to simplify the code. From some research on EMA, it is possible that "EMA checkpoints have better generalization performance, as they smooth out the model weights, leading to better predictions on unseen data" (<https://huggingface.co/stabilityai/stable-diffusion-2-1/discussions/22>). An additional improvement would be to add back the EMA class and EMA model, then retrain SAMIL and the three ablations.

## Loss vs. Epoch

During training, the mean loss for epoch was recorded in a CSV. The following two code blocks download those CSV files, then plot the epoch vs. mean loss for analysis.

```
In [ ]: # Download CSV files containing loss vs. epoch for each model  
!gdown 'https://drive.google.com/uc?id=1-NkHtPMLWKm3pjhuUMF2G4vGrJUGK-cH' # ABMIL  
!gdown 'https://drive.google.com/uc?id=1-V2nvArtrY-Gh7BFD3ermrUPIsrzfEjC' # SAMIL,  
!gdown 'https://drive.google.com/uc?id=1-D11q0MG-gNzChZml3oGvvIcned2RjVw' # SAMIL,  
!gdown 'https://drive.google.com/uc?id=1-5C6RlHsZaCBelRH5iZiaYnAL_9vAfJd' # SAMIL,
```

Downloading...

```
From: https://drive.google.com/uc?id=1-NkHtPMLWKm3pjhuUMF2G4vGrJUGK-cH
```

```
To: /content/train_loss_df_ABMIL.csv
```

```
100% 17.9k/17.9k [00:00<00:00, 47.4MB/s]
```

Downloading...

```
From: https://drive.google.com/uc?id=1-V2nvArtrY-Gh7BFD3ermrUPIsrzfEjC
```

```
To: /content/train_loss_df_NoPretrain.csv
```

```
100% 15.6k/15.6k [00:00<00:00, 44.9MB/s]
```

Downloading...

```
From: https://drive.google.com/uc?id=1-D11q0MG-gNzChZml3oGvvIcned2RjVw
```

```
To: /content/train_loss_df_StudyLevel.csv
```

```
100% 17.4k/17.4k [00:00<00:00, 46.0MB/s]
```

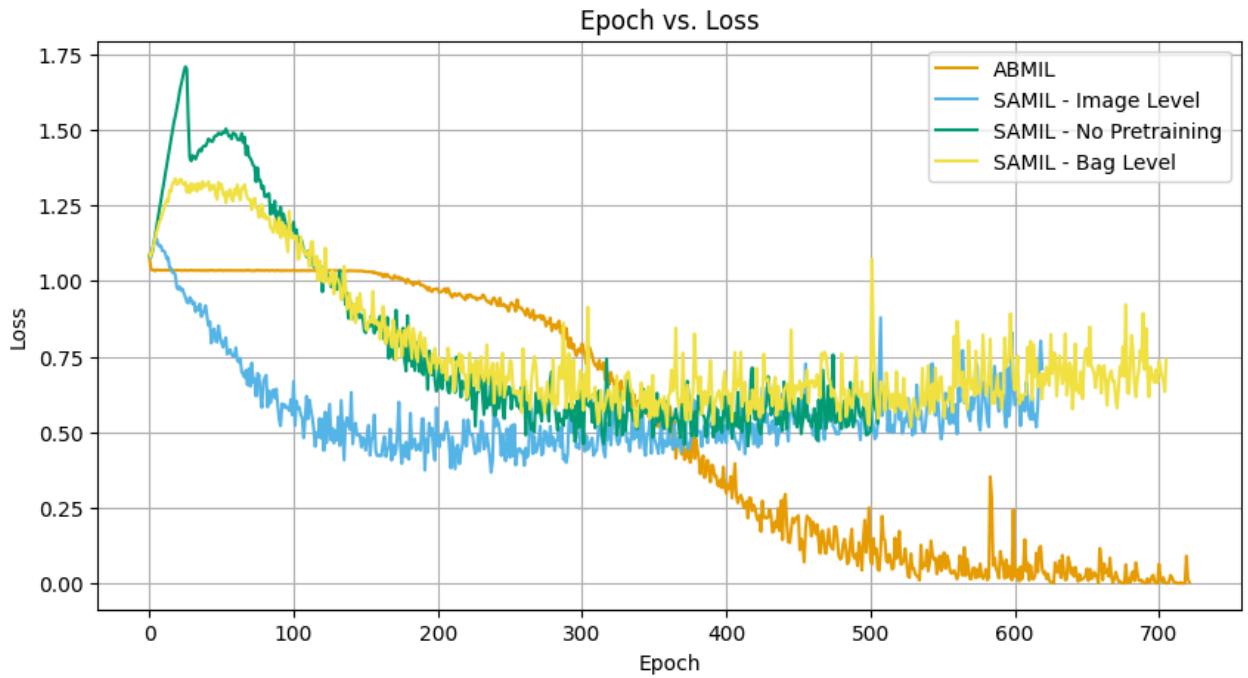
Downloading...

```
From: https://drive.google.com/uc?id=1-5C6RlHsZaCBelRH5iZiaYnAL_9vAfJd
```

```
To: /content/train_loss_df_ImageLevel.csv
```

```
100% 16.8k/16.8k [00:00<00:00, 44.3MB/s]
```

```
In [ ]: import pandas as pd  
import numpy as np  
import matplotlib.pyplot as plt  
  
# Plot Mean Loss vs Epoch  
  
csv_files = ['train_loss_df_ABMIL.csv', 'train_loss_df_ImageLevel.csv', 'train_loss_df_NoPretrain.csv', 'train_loss_df_StudyLevel.csv', 'train_loss_df_SAMIL.csv']  
colors = ['#E69F00', '#56B4E9', '#009E73', '#F0E442']  
labels = ['ABMIL', 'SAMIL - Image Level', 'SAMIL - No Pretraining', 'SAMIL - Bag Level', 'SAMIL - Study Level']  
  
plt.figure(figsize=(10, 5))  
  
for file, color, label in zip(csv_files, colors, labels):  
    data = pd.read_csv(file)  
    plt.plot(data['epoch'], data['loss'], color=color, label=label, markevery=10)  
  
plt.title('Epoch vs. Loss')  
plt.xlabel('Epoch')  
plt.ylabel('Loss')  
plt.legend()  
plt.grid(True)  
plt.show()
```



As seen in the Epoch vs. Loss chart above, ABMIL trained for the highest number of epochs while also having the lowest loss value compared to SAMIL. SAMIL with no pretraining had the highest loss during the first 100 epochs, but then followed the loss curve of SAMIL with Study/Bag Level pretraining very closely. SAMIL with Image Level Pretraining had an inverse trend during the first ~50 epochs where the loss consistently decreased until around 300 epochs where it started to increase, similarly to the other SAMIL variants. The loss mechanism between SAMIL and ABMIL is different, which explains the variation between the two. SAMIL introduces an additional term, Supervised Attention (SA) to steer attention weights to match relevance scores from the view classifier.

#### SAMIL Loss

```

LabeledCELoss = F.cross_entropy(outputs, bag_label, weights,
                                reduction='mean')

current_warmup = np.clip(epoch/(float(ViewRegularization_warmup_pos) * train_epoch), 0, 1)

ViewRegularizationLoss = F.kl_div(input=log_attentions, target=predicted_relative_relevance, reduction='batchmean')

total_loss = LabeledCELoss + lambda_ViewRegularization * ViewRegularizationLoss * current_warmup

total_loss.backward()
optimizer.step()

train_loss += total_loss.detach().cpu().item()

```

#### ABMIL Loss

```

        LabeledCELoss = F.cross_entropy(outputs, bag_label, weights)

        LabeledCELoss.backward()
        optimizer.step()

        train_loss += LabeledCELoss.detach().cpu().item()
    
```

## Balanced Accuracy vs. Epoch

The following code blocks look at the Balanced Accuracy scores for the Validation dataset and Test dataset vs epoch, along with identifying when the "best" test Balanced Accuracy score occurred. Similar to the loss vs. epoch data, these values were recorded each epoch and written to a CSV for analysis. The CSVs are stored in a publicly available Google Drive link and retrieved below using gdown .

```
In [ ]: # Download CSV files containing balanced accuracy vs. epoch for each model

!gdown 'https://drive.google.com/uc?id=1-Jpa3527uS-BBN-Jjoh0PAIzuvNXhBT8' # ABMIL
!gdown 'https://drive.google.com/uc?id=1-TRJSWfmcjF5uE_evaEBhfPKeFafxLEs' # SAMIL,
!gdown 'https://drive.google.com/uc?id=1-9zCZI0hITNQthG1BVWvw2wx0v_f0usH' # SAMIL,
!gdown 'https://drive.google.com/uc?id=1-49TTfxrD0Gxwc0k_kM7eB6rICggdByJ' # SAMIL,

Downloading...
From: https://drive.google.com/uc?id=1-Jpa3527uS-BBN-Jjoh0PAIzuvNXhBT8
To: /content/val_accuracy_df_ABMIL.csv
100% 20.0k/20.0k [00:00<00:00, 53.0MB/s]
Downloading...
From: https://drive.google.com/uc?id=1-TRJSWfmcjF5uE_evaEBhfPKeFafxLEs
To: /content/val_accuracy_df_NoPretrain.csv
100% 17.8k/17.8k [00:00<00:00, 44.4MB/s]
Downloading...
From: https://drive.google.com/uc?id=1-9zCZI0hITNQthG1BVWvw2wx0v_f0usH
To: /content/val_accuracy_df_StudyLevel.csv
100% 19.7k/19.7k [00:00<00:00, 46.4MB/s]
Downloading...
From: https://drive.google.com/uc?id=1-49TTfxrD0Gxwc0k_kM7eB6rICggdByJ
To: /content/val_accuracy_df_ImageLevel.csv
100% 18.9k/18.9k [00:00<00:00, 50.0MB/s]
```

```
In [ ]: # Plot Balanced Accuracy vs. Epoch for Test and Validation
csv_files = ['val_accuracy_df_ABMIL.csv', 'val_accuracy_df_ImageLevel.csv', 'val_ac
colors = ['#E69F00', '#56B4E9', '#009E73', '#F0E442']
labels = ['ABMIL', 'SAMIL - Image Level', 'SAMIL - No Pretraining', 'SAMIL - Bag Le
plt.figure(figsize=(20, 10))

plt.subplot(2,2,1)
for file, color, label in zip(csv_files, colors, labels):
    data = pd.read_csv(file)
    plt.plot(data['epoch'], data['val_raw_Bacc'], color=color, label=label, markeve

plt.title('Epoch vs. Balanced Accuracy - Raw')
plt.xlabel('Epoch')
plt.ylabel('Validation Balanced Accuracy')
plt.legend()
plt.grid(True)

plt.subplot(2,2,2)
for file, color, label in zip(csv_files, colors, labels):
    data = pd.read_csv(file)
    data = data[pd.notna(data['val_raw_Bacc'])]
    coeffs = np.polyfit(data['epoch'], data['val_raw_Bacc'], deg=16)
    p = np.poly1d(coeffs)
    smooth_values = p(data['epoch'])
    plt.plot(data['epoch'], smooth_values, color=color, label=label)

plt.title('Epoch vs. Balanced Accuracy - 16D Polyfit')
plt.xlabel('Epoch')
plt.ylabel('Validation Balanced Accuracy')
plt.legend()
plt.grid(True)

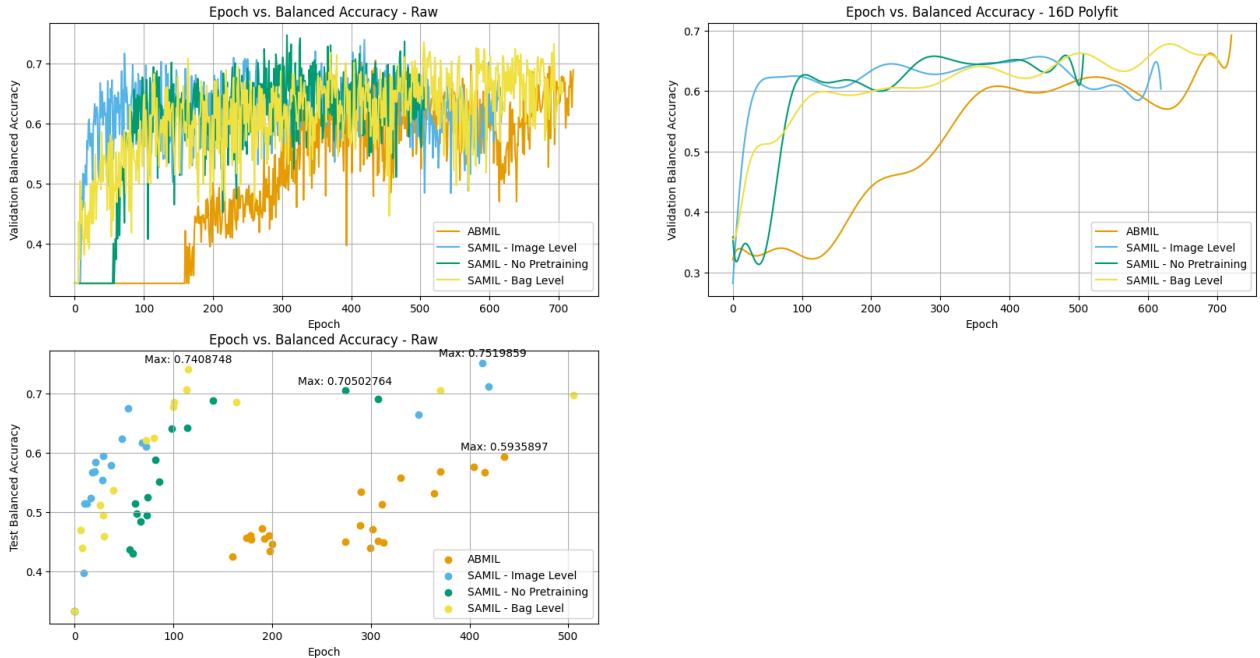
plt.subplot(2,2,3)
for file, color, label in zip(csv_files, colors, labels):
    data = pd.read_csv(file)
    plt.scatter(data['epoch'], data['test_raw_Bacc'], color=color, label=label, mar

    max_bacc = data['test_raw_Bacc'].max()
    max_epoch = data.loc[data['test_raw_Bacc'] == max_bacc, 'epoch'].values[0]

    plt.annotate(f'Max: {max_bacc}', (max_epoch, max_bacc), textcoords="offset point

plt.title('Epoch vs. Balanced Accuracy - Raw')
plt.xlabel('Epoch')
plt.ylabel('Test Balanced Accuracy')
plt.legend()
plt.grid(True)

plt.show()
```



Looking at the Balanced Accuracy charts above, we identify several interesting observations:

1. ABMIL goes ~160 epochs without any change in Balanced Accuracy on the test set, while the SAMIL variants make progress earlier on. You can see though that the SAMIL without pretraining ablation made progress slower than the SAMIL pretraining variants which validates the claim that pretraining improves the model's performance in addition to the overall balanced accuracy scores on the test dataset.
2. The three variants of SAMIL quickly find new maximum Balanced Accuracy scores on the test dataset early on, then make no improvements until epoch ~300. ABMIL appears to find improvements in "clusters" around epoch 200 and 300, then slowly improves over time, finding a maximum at around 430. Compared to SAMIL, it appears ABMIL slowly improves the Balanced Accuracy score whereas SAMIL rapidly improves, plateaus, and eventually reaches a maximum.
3. Similar to the observations in the Analysis section, it appears there is some abnormality in the training run for SAMIL with Bag Level pretraining in that the maximum was identified so early on (epoch ~120).

## Ablations

The results for the ablations were mentioned throughout the Results section. To be clear, the following ablations were performed according to those in the original paper:

1. ABMIL (to show impact on attention)
2. SAMIL with no pretraining (to show impact on pretraining)
3. SAMIL with image level pretraining (to show impact on bag level pretraining vs. image)

Ablations 1 and 2 were validated, however, ablation #3 could not be validated. With additional training runs and hyperparameter searching, it is likely the third would be validated.

# Discussion

## Reproducibility

Based on the results obtained, I believe this paper to be reproducible. While the numbers I obtained did not match 1:1 with the paper, I believe they are directionally accurate enough to suggest that with tweaks to the hyperparameters and additional training runs, the closer results could be obtained across the models.

The code from the repo runs without any major modifications or bug fixes with the exception of Challenge #5 listed below.

## Challenges

1. The code for this paper assumes you will run it outside of a Jupyter notebook, so refactoring of the classes was required to get this functional in a notebook.
2. While the TMED-2 dataset has an access request form, it took three attempts over several weeks to gain access. Ultimately, emailing the staff on the TMED-2 website was required beyond their signup form. For individuals looking to reproduce the results of the paper in short notice, this might pose a challenge.
3. The documentation for the paper's code in the repo is poor. There is only one example of running an experiment without making any changes to the parameters. The authors should have provided robust documentation in the Github repo for how to reproduce each model they evaluated in the various configurations.
4. The computational requirements to train each model posed a costly challenge. Ultimately it required subscribing to Google Colab Pro+ and the purchase of over 1500 compute units in total to train the models on the A100.
5. Instructions in the Github repo readme were incorrect on using the TMED-2 dataset. While the readme pointed to the correct folder in the dataset, the code itself relied on some other dataset structure and file type. This required the preprocessing steps to be adapted to the image format and folder structure of the TMED-2 dataset.
6. The hyperparameters listed in the paper repo produced repeated unfavorable results, which led to GPUs wasted. The paper did mention starter hyperparameter values, but with the original intent in mind of reproduction, I started with what was in the paper for split1.

## Suggestions

To improve reproducibility of this paper, the following suggestions are recommended:

1. Update the Github repo readme to specify exactly how to structure the downloaded data from TMED-2 (where to put it, what the folder structure should be, etc.). Additionally, the data preprocessing in the repo should be updated to handle the format and structure from

- TMED-2.
2. TMED-2 dataset needs a better mechanism to acquire access in a faster more transparent way. The Google Form was filled out 3 times over 3 weeks with no response. An email to all the authors of the dataset was required to gain access and a response.
  3. Github repo readme should outline the steps to reproduce the exact results in the paper, step by step. The readme only gives one example, and no steps on what to adjust for each experiment run in the paper. In summary, for each experiment in the paper, there should be a 1:1 instruction in the readme.
  4. Paper author's should included the execution time of their model on the A100. They mentioned it ran on a single A100 in the paper, but no reference to how long for each run.

Outside of reproducibility, the TMED-2 dataset should be expanded to include additional patient studies, and consider removing the bias towards severe AS cases to improve the balance between early, moderate, and severe AS.

## References

- @misc{huang2021new, title={A New Semi-supervised Learning Benchmark for Classifying View and Diagnosing Aortic Stenosis from Echocardiograms}, author={Zhe Huang and Gary Long and Benjamin Wessler and Michael C. Hughes}, year={2021}, eprint={2108.00080}, archivePrefix={arXiv}, primaryClass={cs.CV} }
- @misc{huang2024detecting, title={Detecting Heart Disease from Multi-View Ultrasound Images via Supervised Attention Multiple Instance Learning}, author={Zhe Huang and Benjamin S. Wessler and Michael C. Hughes}, year={2024}, eprint={2306.00003}, archivePrefix={arXiv}, primaryClass={eess.IV} }