Dog_vs_Cat_Binary_Classification_CNN (1).ipynb

ไฟล์ แก้ไข มุมมอง แทรก รันไทม์ เครื่องมือ ความช่วยเหลือ

แชร์ Gemini

ค้าสั่ง + โค้ด + ข้อความ เชื่อมต่อ

+ โค้ด + ข้อความ

```
# IMPORTANT: RUN THIS CELL IN ORDER TO IMPORT YOUR KAGGLE DATA SOURCES,
# THEN FEEL FREE TO DELETE THIS CELL.
# NOTE: THIS NOTEBOOK ENVIRONMENT DIFFERS FROM KAGGLE'S PYTHON
# ENVIRONMENT SO THERE MAY BE MISSING LIBRARIES USED BY YOUR
# NOTEBOOK.
import kagglehub
arpitjain007_dog_vs_cat_fastai_path = kagglehub.dataset_download('arpitjain007/dog-vs-cat-fastai')

print('Data source import complete.')
```

```
# This Python 3 environment comes with many helpful analytics libraries installed
# It is defined by the kaggle/python Docker image: https://github.com/kaggle/docker-python
# For example, here's several helpful packages to load

import numpy as np # linear algebra
import pandas as pd # data processing, CSV file I/O (e.g. pd.read_csv)

# Input data files are available in the read-only "../input/" directory
# For example, running this (by clicking run or pressing Shift+Enter) will list all files under the input directory

import os
for dirname, _, filenames in os.walk('/kaggle/input'):
    for filename in filenames:
        print(os.path.join(dirname, filename))

# You can write up to 20GB to the current directory (/kaggle/working/) that gets preserved as output when you create a version using "Save & Run All"
# You can also write temporary files to /kaggle/temp/, but they won't be saved outside of the current session
```

```
/kaggle/input/dog-vs-cat-fastai/dogscats/dogscats/valid/dogs/dog.3443.jpg
/kaggle/input/dog-vs-cat-fastai/dogscats/dogscats/valid/dogs/dog.10728.jpg
/kaggle/input/dog-vs-cat-fastai/dogscats/dogscats/valid/dogs/dog.790.jpg
/kaggle/input/dog-vs-cat-fastai/dogscats/dogscats/valid/dogs/dog.10063.jpg
/kaggle/input/dog-vs-cat-fastai/dogscats/dogscats/valid/dogs/dog.2618.jpg
/kaggle/input/dog-vs-cat-fastai/dogscats/dogscats/valid/dogs/dog.2875.jpg
/kaggle/input/dog-vs-cat-fastai/dogscats/dogscats/valid/dogs/dog.5288.jpg
/kaggle/input/dog-vs-cat-fastai/dogscats/dogscats/valid/dogs/dog.4223.jpg
/kaggle/input/dog-vs-cat-fastai/dogscats/dogscats/valid/dogs/dog.4253.jpg
/kaggle/input/dog-vs-cat-fastai/dogscats/dogscats/valid/dogs/dog.7153.jpg
/kaggle/input/dog-vs-cat-fastai/dogscats/dogscats/valid/dogs/dog.2888.jpg
/kaggle/input/dog-vs-cat-fastai/dogscats/dogscats/valid/dogs/dog.7275.jpg
/kaggle/input/dog-vs-cat-fastai/dogscats/dogscats/valid/dogs/dog.10894.jpg
/kaggle/input/dog-vs-cat-fastai/dogscats/dogscats/valid/dogs/dog.7605.jpg
/kaggle/input/dog-vs-cat-fastai/dogscats/dogscats/valid/dogs/dog.433.jpg
/kaggle/input/dog-vs-cat-fastai/dogscats/dogscats/valid/dogs/dog.7759.jpg
/kaggle/input/dog-vs-cat-fastai/dogscats/dogscats/valid/dogs/dog.949.jpg
/kaggle/input/dog-vs-cat-fastai/dogscats/dogscats/valid/dogs/dog.10757.jpg
/kaggle/input/dog-vs-cat-fastai/dogscats/dogscats/valid/dogs/dog.7166.jpg
/kaggle/input/dog-vs-cat-fastai/dogscats/dogscats/valid/dogs/dog.11380.jpg
/kaggle/input/dog-vs-cat-fastai/dogscats/dogscats/valid/dogs/dog.8029.jpg
/kaggle/input/dog-vs-cat-fastai/dogscats/dogscats/valid/dogs/dog.10288.jpg
/kaggle/input/dog-vs-cat-fastai/dogscats/dogscats/valid/dogs/dog.3555.jpg
/kaggle/input/dog-vs-cat-fastai/dogscats/dogscats/valid/dogs/dog.3618.jpg
/kaggle/input/dog-vs-cat-fastai/dogscats/dogscats/valid/dogs/dog.8332.jpg
/kaggle/input/dog-vs-cat-fastai/dogscats/dogscats/valid/dogs/dog.10470.jpg
/kaggle/input/dog-vs-cat-fastai/dogscats/dogscats/valid/dogs/dog.5671.jpg
/kaggle/input/dog-vs-cat-fastai/dogscats/dogscats/valid/dogs/dog.3180.jpg
/kaggle/input/dog-vs-cat-fastai/dogscats/dogscats/valid/dogs/dog.6229.jpg
/kaggle/input/dog-vs-cat-fastai/dogscats/dogscats/valid/dogs/dog.1247.jpg
/kaggle/input/dog-vs-cat-fastai/dogscats/dogscats/valid/dogs/dog.5614.jpg
/kaggle/input/dog-vs-cat-fastai/dogscats/dogscats/valid/dogs/dog.1737.jpg
/kaggle/input/dog-vs-cat-fastai/dogscats/dogscats/valid/dogs/dog.10481.jpg
/kaggle/input/dog-vs-cat-fastai/dogscats/dogscats/valid/dogs/dog.11244.jpg
/kaggle/input/dog-vs-cat-fastai/dogscats/dogscats/valid/dogs/dog.2081.jpg
/kaggle/input/dog-vs-cat-fastai/dogscats/dogscats/valid/dogs/dog.4372.jpg
/kaggle/input/dog-vs-cat-fastai/dogscats/dogscats/valid/dogs/dog.10879.jpg
/kaggle/input/dog-vs-cat-fastai/dogscats/dogscats/valid/dogs/dog.2489.jpg
/kaggle/input/dog-vs-cat-fastai/dogscats/dogscats/valid/dogs/dog.6524.jpg
/kaggle/input/dog-vs-cat-fastai/dogscats/dogscats/valid/dogs/dog.1673.jpg
/kaggle/input/dog-vs-cat-fastai/dogscats/dogscats/valid/dogs/dog.7806.jpg
/kaggle/input/dog-vs-cat-fastai/dogscats/dogscats/valid/dogs/dog.1065.jpg
/kaggle/input/dog-vs-cat-fastai/dogscats/dogscats/valid/dogs/dog.11555.jpg
/kaggle/input/dog-vs-cat-fastai/dogscats/dogscats/valid/dogs/dog.10172.jpg
/kaggle/input/dog-vs-cat-fastai/dogscats/dogscats/valid/dogs/dog.12227.jpg
/kaggle/input/dog-vs-cat-fastai/dogscats/dogscats/valid/dogs/dog.8989.jpg
/kaggle/input/dog-vs-cat-fastai/dogscats/dogscats/valid/dogs/dog.4176.jpg
/kaggle/input/dog-vs-cat-fastai/dogscats/dogscats/valid/dogs/dog.7245.jpg
/kaggle/input/dog-vs-cat-fastai/dogscats/dogscats/valid/dogs/dog.11969.jpg
/kaggle/input/dog-vs-cat-fastai/dogscats/dogscats/valid/dogs/dog.2494.jpg
/kaggle/input/dog-vs-cat-fastai/dogscats/dogscats/valid/dogs/dog.2768.jpg
/kaggle/input/dog-vs-cat-fastai/dogscats/dogscats/valid/dogs/dog.3544.jpg
/kaggle/input/dog-vs-cat-fastai/dogscats/dogscats/valid/dogs/dog.10650.jpg
/kaggle/input/dog-vs-cat-fastai/dogscats/dogscats/valid/dogs/dog.11035.jpg
/kaggle/input/dog-vs-cat-fastai/dogscats/dogscats/valid/dogs/dog.477.jpg
/kaggle/input/dog-vs-cat-fastai/dogscats/dogscats/valid/dogs/dog.1049.jpg
/kaggle/input/dog-vs-cat-fastai/dogscats/dogscats/valid/dogs/dog.2983.jpg
/kaggle/input/dog-vs-cat-fastai/dogscats/dogscats/valid/dogs/dog.12011.jpg
```

```
from pathlib import Path
import os
import tensorflow as tf
from tensorflow.keras.preprocessing.image import ImageDataGenerator
from tensorflow.keras.models import Sequential
from tensorflow.keras.layers import Conv2D, MaxPooling2D, Flatten, Dense, Dropout
```

```
# Define dataset path
train_dir = '/kaggle/input/dog-vs-cat-fastai/dogscats/train/'
val_dir = '/kaggle/input/dog-vs-cat-fastai/dogscats/valid/'

# Define ImageDataGenerator for augmentation
datagen = ImageDataGenerator(rescale=1./255)
train_generator = datagen.flow_from_directory(
    train_dir,
    target_size=(128, 128),
    batch_size=32,
    class_mode='binary'
)
val_generator = datagen.flow_from_directory(
    val_dir,
    target_size=(128, 128),
    batch_size=32,
    class_mode='binary'
)
```

```
Found 23000 images belonging to 2 classes.
Found 2000 images belonging to 2 classes.
```

```
# Define the CNN model
import tensorflow as tf
from tensorflow import keras
from tensorflow.keras import layers
def create_cnn_model(input_shape=(128, 128, 3)):
    model = keras.Sequential([
        layers.Conv2D(32, (3, 3), activation='relu', input_shape=input_shape),
        layers.MaxPooling2D((2, 2)),

        layers.Conv2D(64, (3, 3), activation='relu')
```

```
            layers.MaxPooling2D((2, 2)),

            layers.Conv2D(128, (3, 3), activation='relu'),
            layers.MaxPooling2D((2, 2)),

            layers.Flatten(),
            layers.Dense(128, activation='relu'),
            layers.Dropout(0.5),
            layers.Dense(1, activation='sigmoid')
        ])

        model.compile(optimizer='adam',
                      loss='binary_crossentropy',
                      metrics=['accuracy'])

        return model
```

```
[ ] # Create the model
    model = create_cnn_model()
    model.summary()

    # Train the model
    model.fit(
        train_generator,
        epochs=10,
        validation_data=val_generator
    )
```

```
/opt/conda/lib/python3.10/site-packages/keras/src/layers/convolutional/base_conv.py:107: UserWarning: Do not pass an `input_shape`/`input_dim` argument to a layer. When using Sequential models, prefer using an `Input(shape)` object as
  super().__init__(activity_regularizer=activity_regularizer, **kwargs)
Model: "sequential"
```

Layer (type)	Output Shape	Param #
conv2d (Conv2D)	(None, 126, 126, 32)	896
max_pooling2d (MaxPooling2D)	(None, 63, 63, 32)	0
conv2d_1 (Conv2D)	(None, 61, 61, 64)	18,496
max_pooling2d_1 (MaxPooling2D)	(None, 30, 30, 64)	0
conv2d_2 (Conv2D)	(None, 28, 28, 128)	73,856
max_pooling2d_2 (MaxPooling2D)	(None, 14, 14, 128)	0
flatten (Flatten)	(None, 25088)	0
dense (Dense)	(None, 128)	3,211,392
dropout (Dropout)	(None, 128)	0
dense_1 (Dense)	(None, 1)	129

```
 Total params: 3,304,769 (12.61 MB)
 Trainable params: 3,304,769 (12.61 MB)
 Non-trainable params: 0 (0.00 B)
Epoch 1/10
/opt/conda/lib/python3.10/site-packages/keras/src/trainers/data_adapters/py_dataset_adapter.py:121: UserWarning: Your `PyDataset` class should call `super().__init__(**kwargs)` in its constructor. `**kwargs` can include `workers`, `use
  self._warn_if_super_not_called()
719/719 ━━━━━━━━━━━━━━━━━━━━ 366s 505ms/step - accuracy: 0.6089 - loss: 0.6429 - val_accuracy: 0.7595 - val_loss: 0.4948
Epoch 2/10
719/719 ━━━━━━━━━━━━━━━━━━━━ 359s 499ms/step - accuracy: 0.7680 - loss: 0.4889 - val_accuracy: 0.8030 - val_loss: 0.4133
Epoch 3/10
719/719 ━━━━━━━━━━━━━━━━━━━━ 359s 498ms/step - accuracy: 0.8153 - loss: 0.4087 - val_accuracy: 0.8145 - val_loss: 0.4042
Epoch 4/10
719/719 ━━━━━━━━━━━━━━━━━━━━ 369s 512ms/step - accuracy: 0.8489 - loss: 0.3438 - val_accuracy: 0.8400 - val_loss: 0.3507
Epoch 5/10
719/719 ━━━━━━━━━━━━━━━━━━━━ 372s 516ms/step - accuracy: 0.8914 - loss: 0.2611 - val_accuracy: 0.8485 - val_loss: 0.3490
Epoch 6/10
719/719 ━━━━━━━━━━━━━━━━━━━━ 373s 503ms/step - accuracy: 0.9082 - loss: 0.2244 - val_accuracy: 0.8535 - val_loss: 0.3540
Epoch 7/10
719/719 ━━━━━━━━━━━━━━━━━━━━ 360s 500ms/step - accuracy: 0.9248 - loss: 0.1817 - val_accuracy: 0.8450 - val_loss: 0.4413
Epoch 8/10
719/719 ━━━━━━━━━━━━━━━━━━━━ 359s 499ms/step - accuracy: 0.9460 - loss: 0.1375 - val_accuracy: 0.8640 - val_loss: 0.4280
Epoch 9/10
719/719 ━━━━━━━━━━━━━━━━━━━━ 352s 489ms/step - accuracy: 0.9546 - loss: 0.1137 - val_accuracy: 0.8650 - val_loss: 0.4347
Epoch 10/10
719/719 ━━━━━━━━━━━━━━━━━━━━ 350s 486ms/step - accuracy: 0.9697 - loss: 0.0805 - val_accuracy: 0.8545 - val_loss: 0.4994
<keras.src.callbacks.history.History at 0x7c5581c3d810>
```

```
[ ] # Save entire model
    model.save("/kaggle/working/DogVsCatt.h5", save_format="h5")
```