```
history = model.fit(
    train_data,
    epochs=10,
    validation_data=test_data
)
```

```
/usr/local/lib/python3.12/dist-packages/keras/src/trainers/data_adapters/py_dataset_adapter.py:121: UserWarning: Your `PyDataset` cla
  self._warn_if_super_not_called()
Epoch 1/10
 29/341 ━━━━━━━━━━━━━━━━━━━━ 18:43 4s/step - accuracy: 0.1521 - loss: -41665.9492
```

smart_sorting.ipynb

File Edit View Insert Runtime Tools Help

Commands + Code + Text Run all

[6] 0s

```
!ls /content
```

```
dataset  drive  sample_data
```

[7] 0s

```
!ls /content/dataset
```

```
dataset  test  train
```

[8] 0s

```
!ls /content/dataset/train
```

```
freshapples  freshoranges  rottenbanana
freshbanana  rottenapples  rottenoranges
```

[9] 0s

```
!ls /content/dataset/test
```

```
freshapples  freshoranges  rottenbanana
freshbanana  rottenapples  rottenoranges
```

[18] 19s

```
import tensorflow as tf
from tensorflow.keras.preprocessing.image import ImageDataGenerator

img_size = (224, 224)
batch_size = 32

train_datagen = ImageDataGenerator(rescale=1./255)
test_datagen = ImageDataGenerator(rescale=1./255)

train_data = train_datagen.flow_from_directory(
    '/content/dataset/train',
    target_size=img_size,
    batch_size=batch_size,
    class_mode='binary'
)

test_data = test_datagen.flow_from_directory(
    '/content/dataset/test',
    target_size=img_size,
    batch_size=batch_size,
    class_mode='binary'
)
```

```
Found 10901 images belonging to 6 classes.
Found 2698 images belonging to 6 classes.
```

smart_sorting.ipynb

File Edit View Insert Runtime Tools Help

Commands + Code + Text Run all

[11] ✓ 0s

```
    tf.keras.layers.MaxPooling2D(2,2),
    tf.keras.layers.Flatten(),
    tf.keras.layers.Dense(128, activation='relu'),
    tf.keras.layers.Dense(1, activation='sigmoid')
])

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

model.summary()
```

```
/usr/local/lib/python3.12/dist-packages/keras/src/layers/convolutional/base_conv.py:113: UserWarning: Do not pass an `input_shape`/`input_dim` argument to a layer.
  super().__init__(activity_regularizer=activity_regularizer, **kwargs)
```

Model: "sequential"

Layer (type)	Output Shape	Param #
conv2d (Conv2D)	(None, 222, 222, 32)	896
max_pooling2d (MaxPooling2D)	(None, 111, 111, 32)	0
conv2d_1 (Conv2D)	(None, 109, 109, 64)	18,496
max_pooling2d_1 (MaxPooling2D)	(None, 54, 54, 64)	0
flatten (Flatten)	(None, 186624)	0
dense (Dense)	(None, 128)	23,888,000
dense_1 (Dense)	(None, 1)	129

Total params: 23,907,521 (91.20 MB)
Trainable params: 23,907,521 (91.20 MB)
Non-trainable params: 0 (0.00 B)

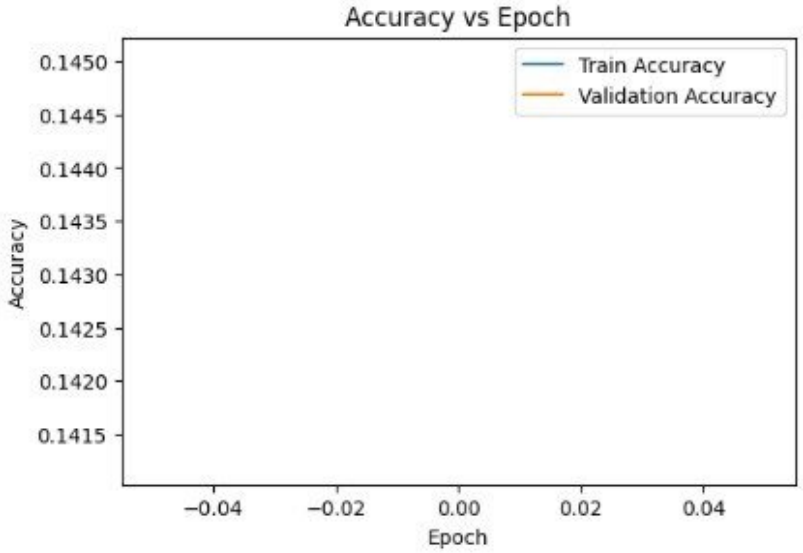
smart_sorting.ipynb

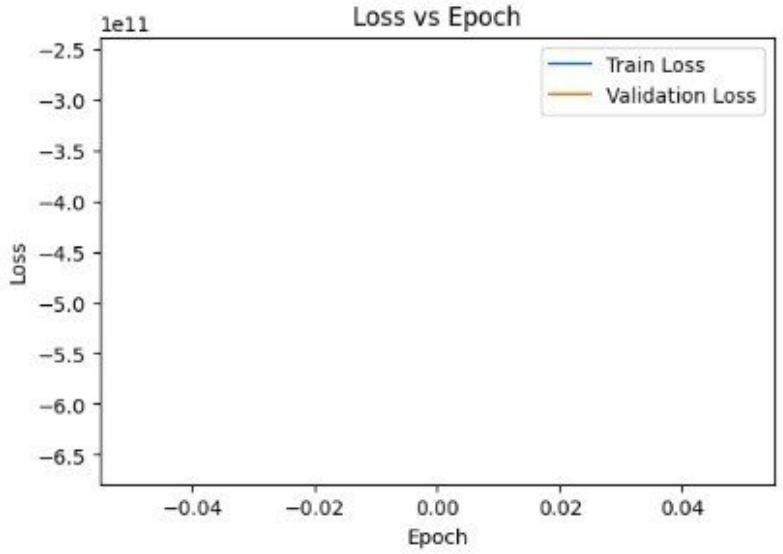
File Edit View Insert Runtime Tools Help

Commands + Code + Text Run all

[15] ✓ 0s

```
plt.figure(figsize=(6,4))
plt.plot(history.history['loss'], label='Train Loss')
plt.plot(history.history['val_loss'], label='Validation Loss')
plt.xlabel('Epoch')
plt.ylabel('Loss')
plt.title('Loss vs Epoch')
plt.legend()
plt.show()
```





```
model.summary()
```

```
/usr/local/lib/python3.12/dist-packages/keras/src/layers/convolutional/base_conv.py:113: UserWarning: Do not pass an `input_shape`/`input_dim` argument to
  super().__init__(activity_regularizer=activity_regularizer, **kwargs)
```

Model: "sequential"

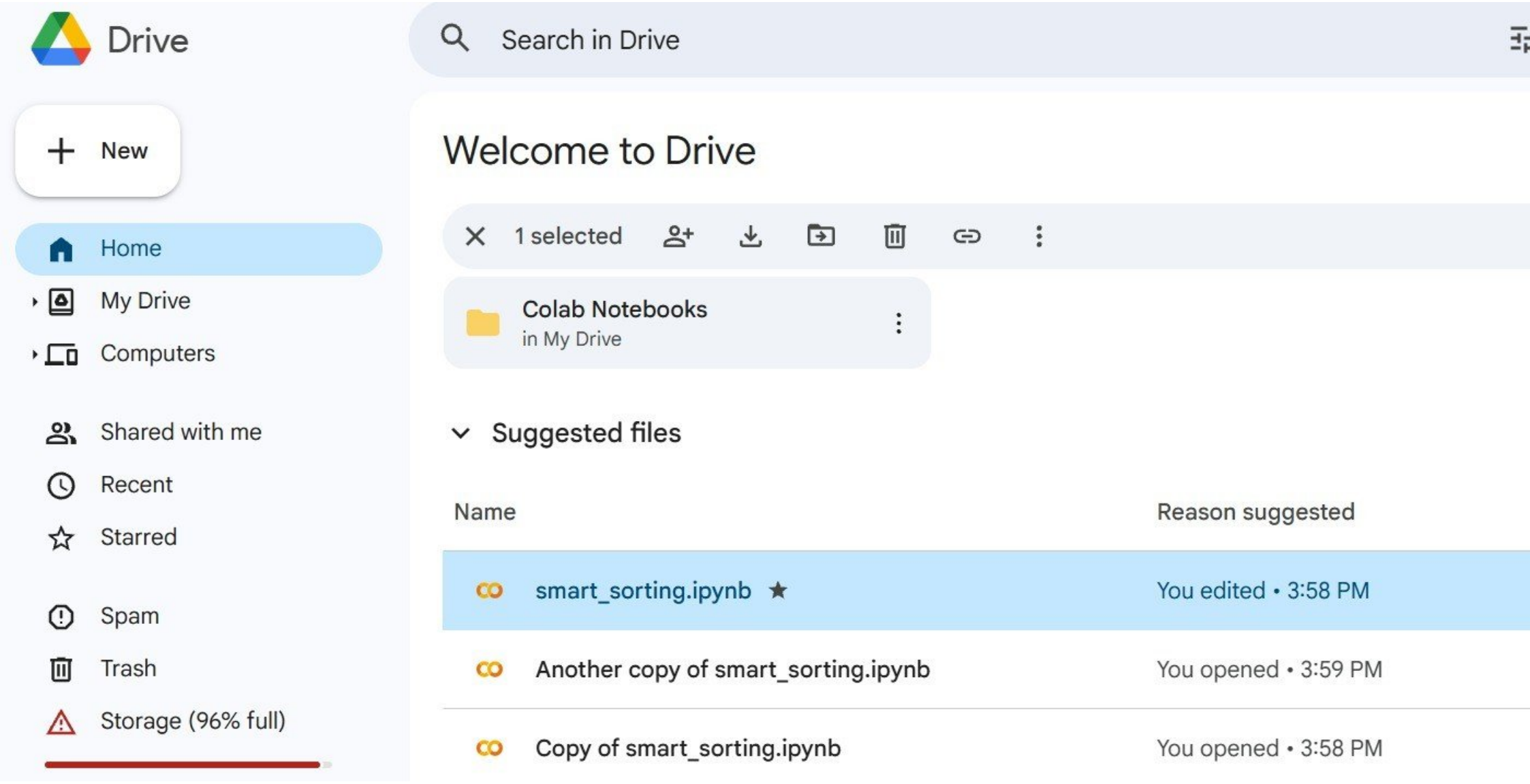
Layer (type)	Output Shape	Param #
conv2d (Conv2D)	(None, 222, 222, 32)	896
max_pooling2d (MaxPooling2D)	(None, 111, 111, 32)	0
conv2d_1 (Conv2D)	(None, 109, 109, 64)	18,496
max_pooling2d_1 (MaxPooling2D)	(None, 54, 54, 64)	0
flatten (Flatten)	(None, 186624)	0
dense (Dense)	(None, 128)	23,888,000
dense_1 (Dense)	(None, 1)	129

Total params: 23,907,521 (91.20 MB)
Trainable params: 23,907,521 (91.20 MB)
Non-trainable params: 0 (0.00 B)

```
history = model.fit(
    train_data,
    epochs=1,
    validation_data=test_data
)
```

```
341/341 ━━━━━━━━━━━━━━━━━━━━ 1094s 3s/step - accuracy: 0.1441 - loss: -127694585856.0000 - val_accuracy: 0.1412 - val_loss: -659036831744.0000
```

```
import matplotlib.pyplot as plt
```


Drive
Search in Drive
New
Home
My Drive
Computers
Shared with me
Recent
Starred
Spam
Trash
Storage (96% full)
Welcome to Drive
1 selected
Colab Notebooks
in My Drive
Suggested files
Name
Reason suggested
smart_sorting.ipynb
You edited • 3:58 PM
Another copy of smart_sorting.ipynb
You opened • 3:59 PM
Copy of smart_sorting.ipynb
You opened • 3:58 PM

smart_sorting.ipynb

File Edit View Insert Runtime Tools Help

Commands + Code + Text Run all

freshbanana rottenapples rottenoranges

[34] ✓ 0s

```
import numpy as np
import os
from tensorflow.keras.preprocessing import image

img_path = '/content/dataset/test/freshapples'  # <-- CORRECT PATH

img_name = os.listdir(img_path)[0]
img_full_path = os.path.join(img_path, img_name)

img = image.load_img(img_full_path, target_size=(224, 224))
img = image.img_to_array(img)
img = np.expand_dims(img, axis=0) / 255.0

prediction = model.predict(img)

print("Image:", img_name)
print("Raw output:", prediction)

print("Prediction:", "Fresh" if prediction[0][0] > 0.5 else "Rotten")
```

```
1/1 ━━━━━━━━━━━━━━━━━━━━ 0s 197ms/step
Image: Screen Shot 2018-06-08 at 5.28.59 PM.png
Raw output: [[1.]]
Prediction: Fresh
```

smart_sorting.ipynb

File Edit View Insert Runtime Tools Help

Commands + Code + Text Run all

[1] ✓ 32s

```
from google.colab import drive
drive.mount('/content/drive')
```

```
Mounted at /content/drive
```

[3] ✓ 0s

```
!ls /content/drive/MyDrive
```

```
 archive.zip  'Colab Notebooks'
```

[5]

```
!unzip /content/drive/MyDrive/archive.zip -d /content/
```

```
Streaming output truncated to the last 5000 lines.
  inflating: /content/dataset/dataset/train/freshapples/rotated_by_75_Screen Shot 2018-06-08 at 5.10.03 PM.png
  inflating: /content/dataset/dataset/train/freshapples/rotated_by_75_Screen Shot 2018-06-08 at 5.10.11 PM.png
  inflating: /content/dataset/dataset/train/freshapples/rotated_by_75_Screen Shot 2018-06-08 at 5.10.21 PM.png
  inflating: /content/dataset/dataset/train/freshapples/rotated_by_75_Screen Shot 2018-06-08 at 5.10.29 PM.png
  inflating: /content/dataset/dataset/train/freshapples/rotated_by_75_Screen Shot 2018-06-08 at 5.10.37 PM.png
  inflating: /content/dataset/dataset/train/freshapples/rotated_by_75_Screen Shot 2018-06-08 at 5.10.43 PM.png
  inflating: /content/dataset/dataset/train/freshapples/rotated_by_75_Screen Shot 2018-06-08 at 5.10.53 PM.png
  inflating: /content/dataset/dataset/train/freshapples/rotated_by_75_Screen Shot 2018-06-08 at 5.11.02 PM.png
  inflating: /content/dataset/dataset/train/freshapples/rotated_by_75_Screen Shot 2018-06-08 at 5.11.08 PM.png
  inflating: /content/dataset/dataset/train/freshapples/rotated_by_75_Screen Shot 2018-06-08 at 5.11.16 PM.png
  inflating: /content/dataset/dataset/train/freshapples/rotated_by_75_Screen Shot 2018-06-08 at 5.11.24 PM.png
  inflating: /content/dataset/dataset/train/freshapples/rotated_by_75_Screen Shot 2018-06-08 at 5.11.35 PM.png
  inflating: /content/dataset/dataset/train/freshapples/rotated_by_75_Screen Shot 2018-06-08 at 5.11.41 PM.png
  inflating: /content/dataset/dataset/train/freshapples/rotated_by_75_Screen Shot 2018-06-08 at 5.11.52 PM.png
  inflating: /content/dataset/dataset/train/freshapples/rotated_by_75_Screen Shot 2018-06-08 at 5.11.59 PM.png
  inflating: /content/dataset/dataset/train/freshapples/rotated_by_75_Screen Shot 2018-06-08 at 5.12.14 PM.png
  inflating: /content/dataset/dataset/train/freshapples/rotated_by_75_Screen Shot 2018-06-08 at 5.12.20 PM.png
  inflating: /content/dataset/dataset/train/freshapples/rotated_by_75_Screen Shot 2018-06-08 at 5.12.29 PM.png
  inflating: /content/dataset/dataset/train/freshapples/rotated_by_75_Screen Shot 2018-06-08 at 5.12.34 PM.png
```