

```
!unzip DATASET-JPG.zip -d /content/dataset
```

```
unzip: cannot find or open DATASET-JPG.zip, DATASET-JPG.zip.zip or DATASET-JPG.zip.ZIP.
```

```
!unzip DATASET JPG.zip -d /content/dataset
```

```
unzip: cannot find or open DATASET, DATASET.zip or DATASET.ZIP.
```

```
!ls /content
```

```
'DATASET JPG.zip' sample_data
```

```
!unzip "DATASET JPG.zip" -d /content/dataset
```

```
Archive: DATASET JPG.zip
  creating: /content/dataset/DATASET JPG/
  creating: /content/dataset/DATASET JPG/withmask/
 inflating: /content/dataset/DATASET JPG/withmask/011.jpg
 inflating: /content/dataset/DATASET JPG/withmask/012.jpg
 inflating: /content/dataset/DATASET JPG/withmask/028.jpg
 inflating: /content/dataset/DATASET JPG/withmask/035.jpg
 inflating: /content/dataset/DATASET JPG/withmask/043.jpg
 inflating: /content/dataset/DATASET JPG/withmask/053.jpg
 inflating: /content/dataset/DATASET JPG/withmask/079.jpg
 inflating: /content/dataset/DATASET JPG/withmask/086.jpg
 inflating: /content/dataset/DATASET JPG/withmask/094.jpg
 inflating: /content/dataset/DATASET JPG/withmask/095.jpg
 inflating: /content/dataset/DATASET JPG/withmask/100.jpg
 inflating: /content/dataset/DATASET JPG/withmask/103.jpg
 inflating: /content/dataset/DATASET JPG/withmask/111.jpg
 inflating: /content/dataset/DATASET JPG/withmask/139.jpg
 inflating: /content/dataset/DATASET JPG/withmask/149.jpg
 inflating: /content/dataset/DATASET JPG/withmask/152.jpg
 inflating: /content/dataset/DATASET JPG/withmask/161.jpg
 inflating: /content/dataset/DATASET JPG/withmask/165.jpg
 inflating: /content/dataset/DATASET JPG/withmask/172.jpg
 inflating: /content/dataset/DATASET JPG/withmask/183.jpg
 inflating: /content/dataset/DATASET JPG/withmask/186.jpg
 inflating: /content/dataset/DATASET JPG/withmask/192.jpg
 inflating: /content/dataset/DATASET JPG/withmask/199.jpg
 inflating: /content/dataset/DATASET JPG/withmask/203.jpg
 inflating: /content/dataset/DATASET JPG/withmask/207.jpg
 inflating: /content/dataset/DATASET JPG/withmask/217.jpg
 inflating: /content/dataset/DATASET JPG/withmask/229.jpg
 inflating: /content/dataset/DATASET JPG/withmask/248.jpg
 inflating: /content/dataset/DATASET JPG/withmask/254.jpg
   creating: /content/dataset/DATASET JPG/without/
 inflating: /content/dataset/DATASET JPG/without/CMFD179.jpg
 inflating: /content/dataset/DATASET JPG/without/CMFD223.jpg
 inflating: /content/dataset/DATASET JPG/without/CMFD251.jpg
 inflating: /content/dataset/DATASET JPG/without/CMFD326.jpg
 inflating: /content/dataset/DATASET JPG/without/CMFD348.jpg
 inflating: /content/dataset/DATASET JPG/without/CMFD353.jpg
 inflating: /content/dataset/DATASET JPG/without/CMFD365.jpg
 inflating: /content/dataset/DATASET JPG/without/CMFD370.jpg
 inflating: /content/dataset/DATASET JPG/without/CMFD379.jpg
 inflating: /content/dataset/DATASET JPG/without/CMFD380.jpg
 inflating: /content/dataset/DATASET JPG/without/CMFD383.jpg
 inflating: /content/dataset/DATASET JPG/without/CMFD391.jpg
 inflating: /content/dataset/DATASET JPG/without/CMFD473.jpg
 inflating: /content/dataset/DATASET JPG/without/CMFD474.jpg
 inflating: /content/dataset/DATASET JPG/without/CMFD480.jpg
 inflating: /content/dataset/DATASET JPG/without/CMFD756.jpg
 inflating: /content/dataset/DATASET JPG/without/CMFD771.jpg
 inflating: /content/dataset/DATASET JPG/without/CMFD793.jpg
 inflating: /content/dataset/DATASET JPG/without/CMFD797.jpg
 inflating: /content/dataset/DATASET JPG/without/CMFD813.jpg
```

```
!ls "/content/dataset/DATASET JPG"
```

```
withmask without
```

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

```
base_dir = "/content/dataset/DATASET JPG"
```

```

datagen = ImageDataGenerator(
    rescale=1./255,
    validation_split=0.2
)

train_data = datagen.flow_from_directory(
    base_dir,
    target_size=(128,128),
    batch_size=32,
    class_mode='binary',
    subset='training'
)

val_data = datagen.flow_from_directory(
    base_dir,
    target_size=(128,128),
    batch_size=32,
    class_mode='binary',
    subset='validation'
)

```

Found 40 images belonging to 2 classes.
Found 9 images belonging to 2 classes.

```

from tensorflow.keras.models import Sequential
from tensorflow.keras.layers import Conv2D, MaxPooling2D, Flatten, Dense

model = Sequential([
    Conv2D(32, (3,3), activation='relu', input_shape=(128,128,3)),
    MaxPooling2D(2,2),

    Conv2D(64, (3,3), activation='relu'),
    MaxPooling2D(2,2),

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

    Flatten(),
    Dense(128, activation='relu'),
    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`
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
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)

```

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

```

```

Epoch 1/10
/usr/local/lib/python3.12/dist-packages/keras/src/trainers/data_adapters/py_dataset_adapter.py:121: UserWarning: Your `PyDataset
self._warn_if_super_not_called()
2/2 ----- 4s 2s/step - accuracy: 0.4917 - loss: 0.7700 - val_accuracy: 0.5556 - val_loss: 0.6844
Epoch 2/10
2/2 ----- 3s 2s/step - accuracy: 0.2833 - loss: 0.7607 - val_accuracy: 0.4444 - val_loss: 0.6972
Epoch 3/10
2/2 ----- 2s 1s/step - accuracy: 0.3917 - loss: 0.7034 - val_accuracy: 0.8889 - val_loss: 0.6769
Epoch 4/10
2/2 ----- 1s 339ms/step - accuracy: 1.0000 - loss: 0.6633 - val_accuracy: 0.5556 - val_loss: 0.6674
Epoch 5/10
2/2 ----- 1s 959ms/step - accuracy: 0.6083 - loss: 0.6415 - val_accuracy: 0.7778 - val_loss: 0.6279
Epoch 6/10
2/2 ----- 1s 347ms/step - accuracy: 0.9729 - loss: 0.5820 - val_accuracy: 0.8889 - val_loss: 0.5684
Epoch 7/10
2/2 ----- 1s 960ms/step - accuracy: 1.0000 - loss: 0.4850 - val_accuracy: 0.8889 - val_loss: 0.4871
Epoch 8/10
2/2 ----- 1s 1s/step - accuracy: 0.8833 - loss: 0.3877 - val_accuracy: 0.8889 - val_loss: 0.4406
Epoch 9/10
2/2 ----- 2s 1s/step - accuracy: 0.9667 - loss: 0.1863 - val_accuracy: 1.0000 - val_loss: 0.2877
Epoch 10/10
2/2 ----- 2s 2s/step - accuracy: 1.0000 - loss: 0.1169 - val_accuracy: 0.8889 - val_loss: 0.1863

```

```

import matplotlib.pyplot as plt

# Accuracy
plt.plot(history.history['accuracy'], label='Train Accuracy')
plt.plot(history.history['val_accuracy'], label='Validation Accuracy')
plt.title('Model Accuracy')
plt.xlabel('Epoch')
plt.ylabel('Accuracy')
plt.legend()
plt.show()

# Loss
plt.plot(history.history['loss'], label='Train Loss')
plt.plot(history.history['val_loss'], label='Validation Loss')
plt.title('Model Loss')
plt.xlabel('Epoch')
plt.ylabel('Loss')
plt.legend()
plt.show()

```

