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

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

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

```
IMG_SIZE=224
BATCH_SIZE=32

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

train_generator=train_datagen.flow_from_directory(
    '/content/drive/MyDrive/smoke vs non smoke',
    target_size=(IMG_SIZE,IMG_SIZE),
    batch_size=BATCH_SIZE,
    class_mode='binary',
    subset='training'
)
```

```
Found 800 images belonging to 1 classes.
```

```
val_generator=train_datagen.flow_from_directory(
    '/content/drive/MyDrive/smoke vs non smoke',
    target_size=(IMG_SIZE,IMG_SIZE),
    batch_size=BATCH_SIZE,
    class_mode='binary',
    subset='validation'
)
```

```
Found 200 images belonging to 1 classes.
```

```
model=keras.Sequential([
    layers.Conv2D(32,(3,3),activation='relu',
input_shape=(IMG_SIZE,IMG_SIZE,3)),
    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.Dense(1,activation='sigmoid')
])
```

```
/usr/local/lib/python3.11/dist-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 the first layer in
the model instead.
  super().__init__(activity_regularizer=activity_regularizer,
**kwargs)

model.summary()

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 │
├──────────────────────────────────────┼─────────────────────────────┼─────────────────
┤
│ conv2d_2 (Conv2D)                    │ (None, 52, 52, 128)         │
73,856 │
├──────────────────────────────────────┼─────────────────────────────┼─────────────────
┤
│ max_pooling2d_2 (MaxPooling2D)       │ (None, 26, 26, 128)         │
0 │
├──────────────────────────────────────┼─────────────────────────────┼─────────────────
┤
│ flatten (Flatten)                    │ (None, 86528)               │
0 │
├──────────────────────────────────────┼─────────────────────────────┼─────────────────
┤
│ dense (Dense)                        │ (None, 128)                 │
11,075,712 │
├──────────────────────────────────────┼─────────────────────────────┼─────────────────
┤
│ dense_1 (Dense)                      │ (None, 1)                   │
129 │
```

```
└─────────────────────────────────────┴────────────────────────────┴──────────
──────┘

 Total params: 11,169,089 (42.61 MB)

 Trainable params: 11,169,089 (42.61 MB)

 Non-trainable params: 0 (0.00 B)
```

```
model.compile(optimizer='adam',loss='binary_crossentropy',metrics=['ac
curacy'])
```

```
model.fit(train_generator,epochs=5,validation_data=val_generator,batch
_size=BATCH_SIZE)
```

```
/usr/local/lib/python3.11/dist-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_multiprocessing`,
`max_queue_size`. Do not pass these arguments to `fit()`, as they will
be ignored.
  self._warn_if_super_not_called()

Epoch 1/5
25/25 ━━━━━━━━━━━━━━━━━━━━ 0s 6s/step - accuracy: 0.9380 - loss:
0.1055

/usr/local/lib/python3.11/dist-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_multiprocessing`,
`max_queue_size`. Do not pass these arguments to `fit()`, as they will
be ignored.
  self._warn_if_super_not_called()

 25/25 ━━━━━━━━━━━━━━━━━━━━ 195s 8s/step - accuracy: 0.9398 - loss:
0.1025 - val_accuracy: 1.0000 - val_loss: 0.0000e+00
Epoch 2/5
25/25 ━━━━━━━━━━━━━━━━━━━━ 60s 2s/step - accuracy: 1.0000 - loss:
0.0000e+00 - val_accuracy: 1.0000 - val_loss: 0.0000e+00
Epoch 3/5
25/25 ━━━━━━━━━━━━━━━━━━━━ 62s 2s/step - accuracy: 1.0000 - loss:
0.0000e+00 - val_accuracy: 1.0000 - val_loss: 0.0000e+00
Epoch 4/5
25/25 ━━━━━━━━━━━━━━━━━━━━ 65s 3s/step - accuracy: 1.0000 - loss:
0.0000e+00 - val_accuracy: 1.0000 - val_loss: 0.0000e+00
Epoch 5/5
25/25 ━━━━━━━━━━━━━━━━━━━━ 63s 3s/step - accuracy: 1.0000 - loss:
0.0000e+00 - val_accuracy: 1.0000 - val_loss: 0.0000e+00

<keras.src.callbacks.history.History at 0x7b731054eb90>
```

```
model.save('/content/drive/MyDrive/smoke vs non smoke_model.h5')
```

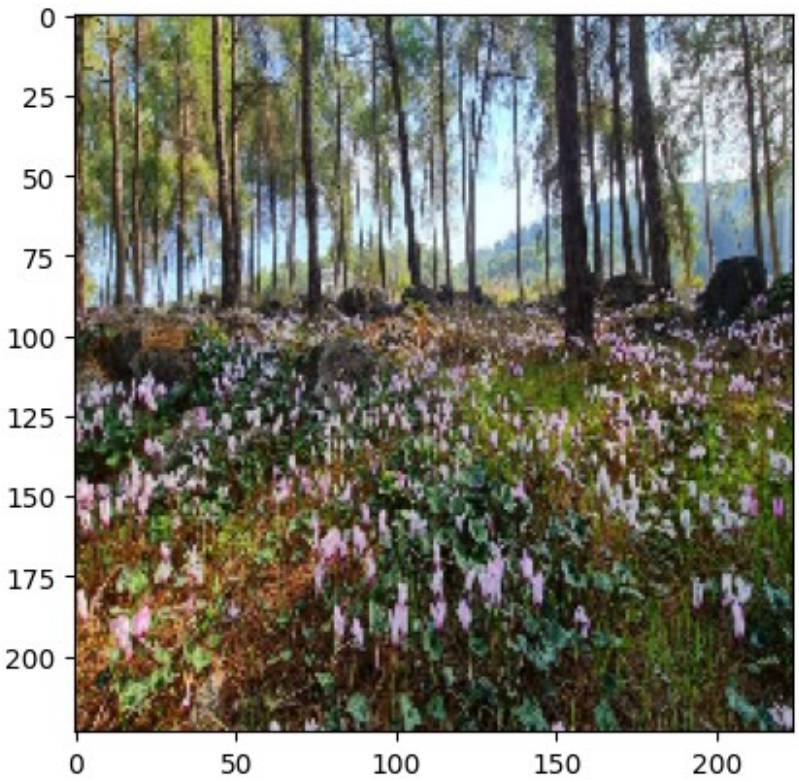
```
WARNING:absl:You are saving your model as an HDF5 file via `model.save()` or `keras.saving.save_model(model)`. This file format is considered legacy. We recommend using instead the native Keras format, e.g. `model.save('my_model.keras')` or `keras.saving.save_model(model, 'my_model.keras')`.
```

```
from tensorflow.keras.models import load_model
from tensorflow.keras.preprocessing import image
import matplotlib.pyplot as plt
import numpy as np
model=load_model('/content/drive/MyDrive/smoke vs non smoke_model.h5')
print('Model Loaded Sucessfully')
```

```
WARNING:absl:Compiled the loaded model, but the compiled metrics have yet to be built. `model.compile_metrics` will be empty until you train or evaluate the model.
```

```
Model Loaded Sucessfully
```

```
test_image_path="/content/drive/MyDrive/smoke vs non smoke/data/non smoke/forest22.jpg"
img=image.load_img(test_image_path,target_size=(224,224))
plt.imshow(img)
plt.axis()
plt.show()
```




```
img_array=image.img_to_array(img)
img_array=np.expand_dims(img_array,axis=0)
img_array/=255

prediction=model.predict(img_array)
print(prediction)
if prediction>=0.5:
  print("The smoke is present")
else:
  print("there is no smoke is present")
```

```
1/1 ━━━━━━━━━━━━━━━━━━━━ 0s 54ms/step
[[0.]]
there is no smoke is present
```