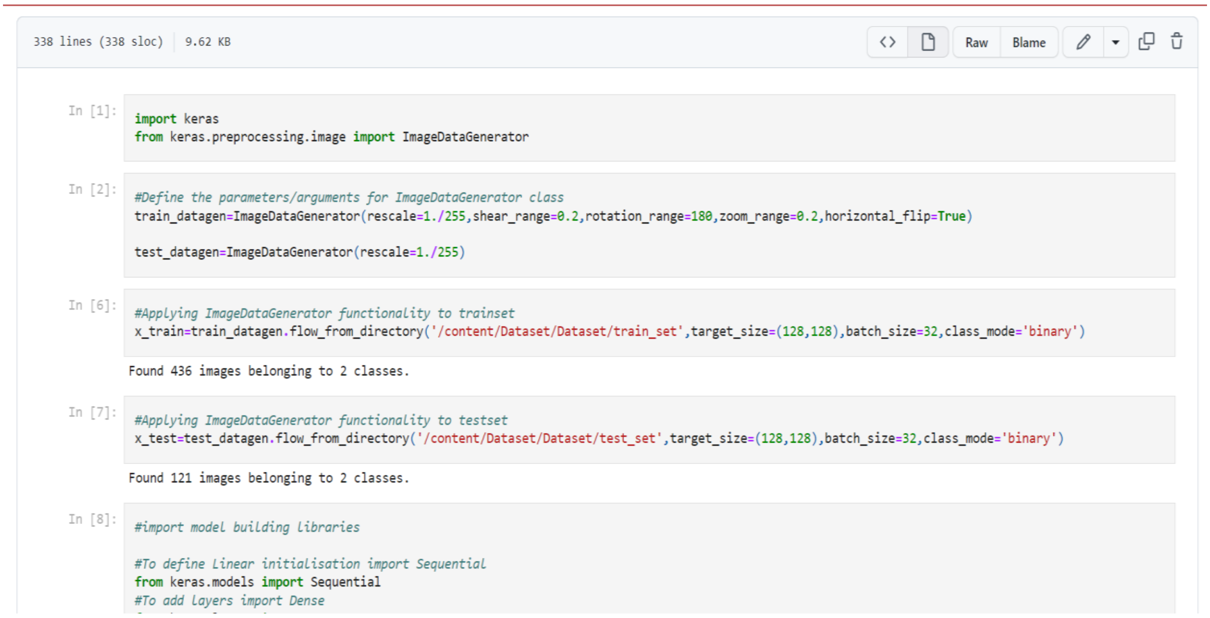
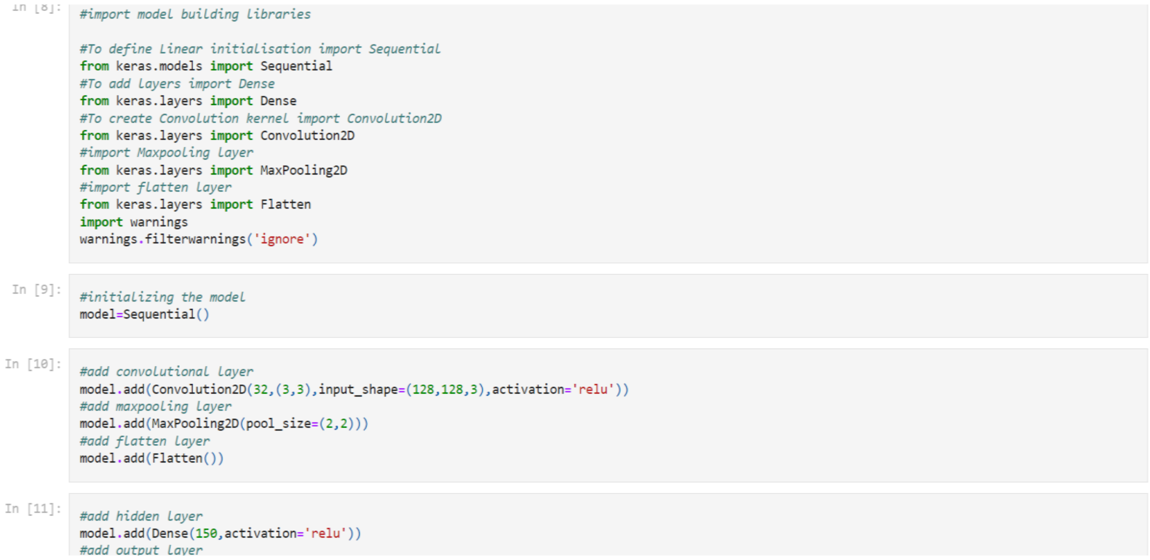
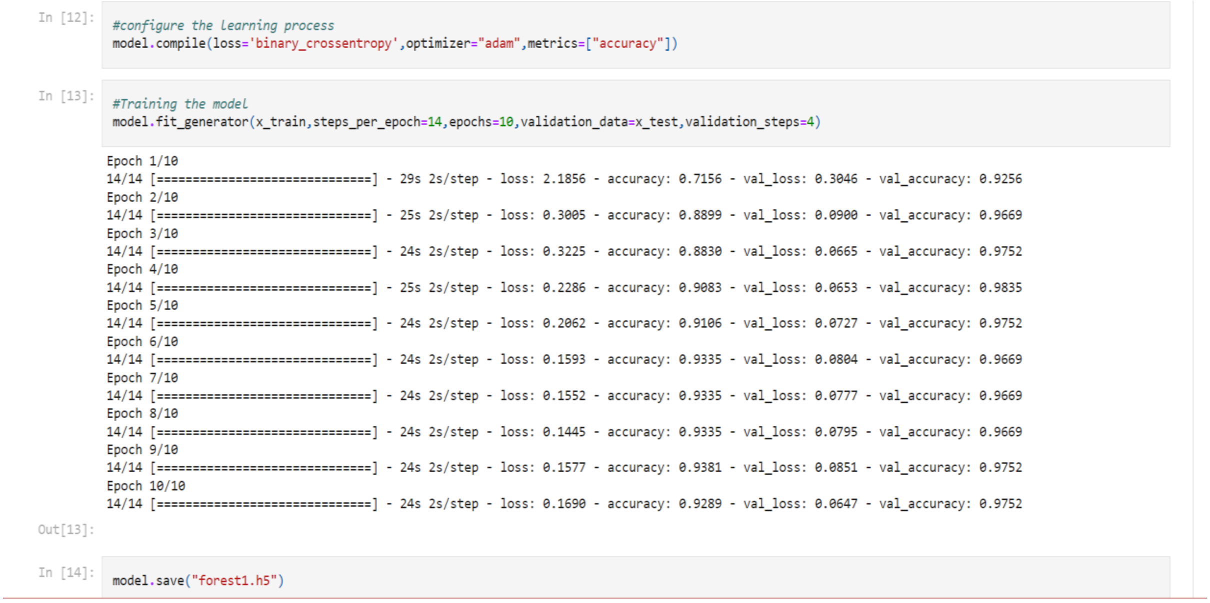


```
In [1]:  import keras
         from keras.preprocessing.image import ImageDataGenerator

In [2]:  #Define the parameters/arguments for ImageDataGenerator class
         train_datagen=ImageDataGenerator(rescale=1./255,shear_range=0.2,rotation_range=180,zoom_range=0.2,horizontal_flip=True)

         test_datagen=ImageDataGenerator(rescale=1./255)

In [6]:  #Applying ImageDataGenerator functionality to trainset
         x_train=train_datagen.flow_from_directory('/content/Dataset/Dataset/train_set',target_size=(128,128),batch_size=32,class_mode='binary')

         Found 436 images belonging to 2 classes.

In [7]:  #Applying ImageDataGenerator functionality to testset
         x_test=test_datagen.flow_from_directory('/content/Dataset/Dataset/test_set',target_size=(128,128),batch_size=32,class_mode='binary')

         Found 121 images belonging to 2 classes.

In [8]:  #import model building libraries

         #To define Linear initialisation import Sequential
         from keras.models import Sequential
         #To add layers import Dense
```

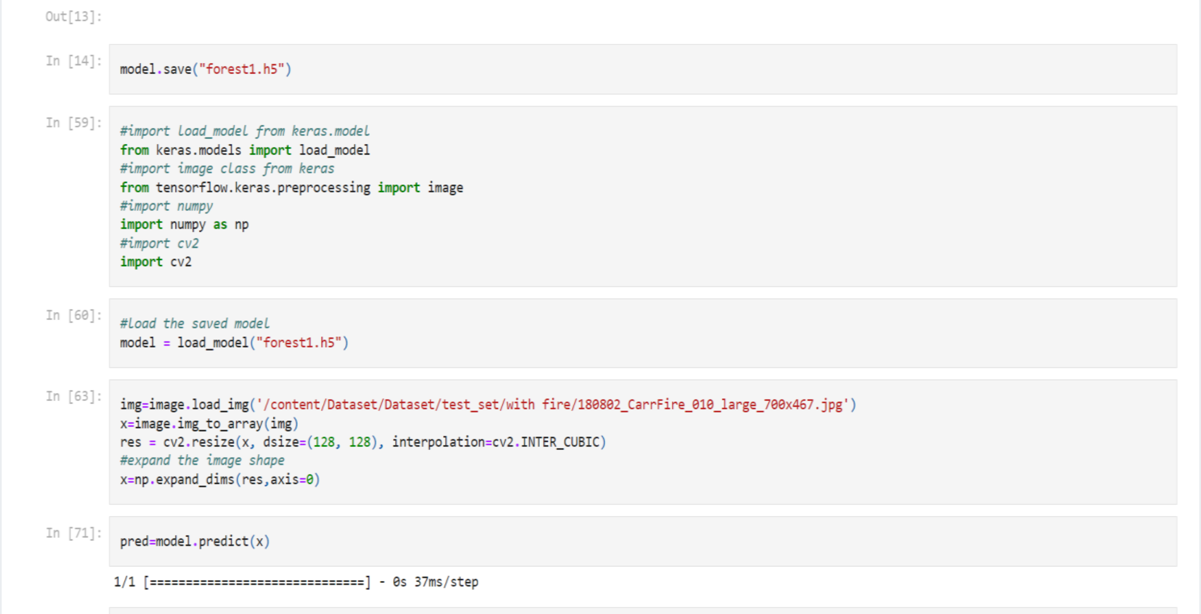


```
In [8]:  #import model building libraries

         #To define Linear initialisation import Sequential
         from keras.models import Sequential
         #To add layers import Dense
```

```
         from keras.layers import Dense
         #To create Convolution kernel import Convolution2D
         from keras.layers import Convolution2D
         #import Maxpooling layer
         from keras.layers import MaxPooling2D
         #import flatten layer
         from keras.layers import Flatten
         import warnings
         warnings.filterwarnings('ignore')

In [9]:  #initializing the model
         model=Sequential()

In [10]: #add convolutional layer
         model.add(Convolution2D(32,(3,3),input_shape=(128,128,3),activation='relu'))
         #add maxpooling layer
         model.add(MaxPooling2D(pool_size=(2,2)))
         #add flatten layer
         model.add(Flatten())

In [11]: #add hidden layer
         model.add(Dense(150,activation='relu'))
         #add output layer
```



```
In [12]: #configure the learning process
         model.compile(loss='binary_crossentropy',optimizer="adam",metrics=["accuracy"])

In [13]: #Training the model
         model.fit_generator(x_train,steps_per_epoch=14,epochs=10,validation_data=x_test,validation_steps=4)

Epoch 1/10
14/14 [==============================] - 29s 2s/step - loss: 2.1856 - accuracy: 0.7156 - val_loss: 0.3046 - val_accuracy: 0.9256
Epoch 2/10
14/14 [==============================] - 25s 2s/step - loss: 0.3005 - accuracy: 0.8899 - val_loss: 0.0900 - val_accuracy: 0.9669
Epoch 3/10
14/14 [==============================] - 24s 2s/step - loss: 0.3225 - accuracy: 0.8830 - val_loss: 0.0665 - val_accuracy: 0.9752
Epoch 4/10
14/14 [==============================] - 25s 2s/step - loss: 0.2286 - accuracy: 0.9083 - val_loss: 0.0653 - val_accuracy: 0.9835
Epoch 5/10
14/14 [==============================] - 24s 2s/step - loss: 0.2062 - accuracy: 0.9106 - val_loss: 0.0727 - val_accuracy: 0.9752
Epoch 6/10
14/14 [==============================] - 24s 2s/step - loss: 0.1593 - accuracy: 0.9335 - val_loss: 0.0804 - val_accuracy: 0.9669
Epoch 7/10
14/14 [==============================] - 24s 2s/step - loss: 0.1552 - accuracy: 0.9335 - val_loss: 0.0777 - val_accuracy: 0.9669
Epoch 8/10
14/14 [==============================] - 24s 2s/step - loss: 0.1445 - accuracy: 0.9335 - val_loss: 0.0795 - val_accuracy: 0.9669
Epoch 9/10
14/14 [==============================] - 24s 2s/step - loss: 0.1577 - accuracy: 0.9381 - val_loss: 0.0851 - val_accuracy: 0.9752
Epoch 10/10
14/14 [==============================] - 24s 2s/step - loss: 0.1690 - accuracy: 0.9289 - val_loss: 0.0647 - val_accuracy: 0.9752

Out[13]:

In [14]: model.save("forest1.h5")
```



```
Out[13]:

In [14]: model.save("forest1.h5")
```

```
In [59]: #import load_model from keras.model
         from keras.models import load_model
         #import image class from keras
         from tensorflow.keras.preprocessing import image
         #import numpy
         import numpy as np
         #import cv2
         import cv2

In [60]: #load the saved model
         model = load_model("forest1.h5")

In [63]: img=image.load_img('/content/Dataset/Dataset/test_set/with fire/180802_CarrFire_010_large_700x467.jpg')
         x=image.img_to_array(img)
         res = cv2.resize(x, dsize=(128, 128), interpolation=cv2.INTER_CUBIC)
         #expand the image shape
         x=np.expand_dims(res,axis=0)

In [71]: pred=model.predict(x)

1/1 [==============================] - 0s 37ms/step
```

```
model = load_model('forest1.h5')
```

In [63]:

```
img=image.load_img('/content/Dataset/Dataset/test_set/with fire/180802_CarrFire_010_large_700x467.jpg')
x=image.img_to_array(img)
res = cv2.resize(x, dsize=(128, 128), interpolation=cv2.INTER_CUBIC)
#expand the image shape
x=np.expand_dims(res,axis=0)
```

In [71]:

```
pred=model.predict(x)
```

```
1/1 [==============================] - 0s 37ms/step
```

In [72]:

```
pred
```

Out[72]:

```
array([[1.]], dtype=float32)
```

In [ ]: