EARLYDETECTIONOFFORESTFIREUSINGDEEPLEARNING

MODEL

BUILDINGSAVE

THEMODEL

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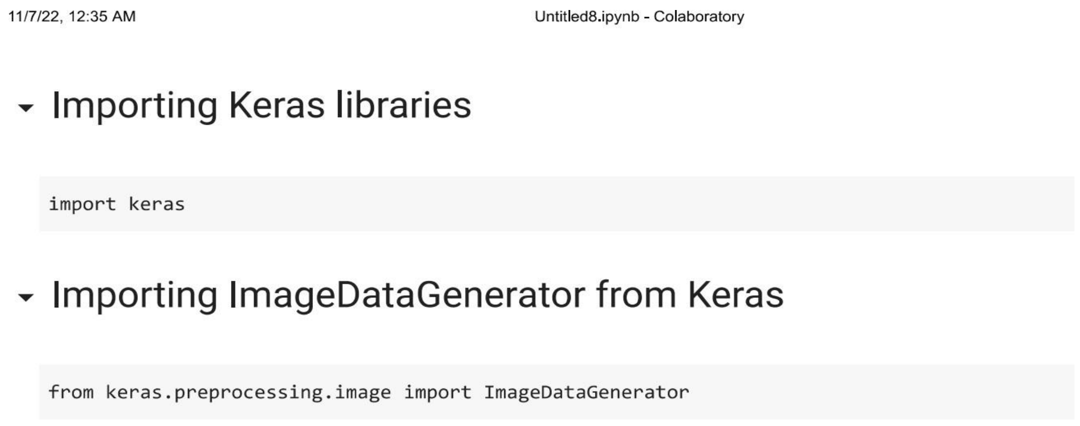
ProjectName	Project-Early detection of forest fire using deeplearning

SAVETHEMODEL

Yourmodelistobesavedforfuturepurposes.Thissavedmodelalsoisintegratedwithanandroidapplication orweb application inorder to predict something.

IMPORTLIBRARIES:



11/7/22, 12:35 AM Untitled8.ipynb - Colaboratory

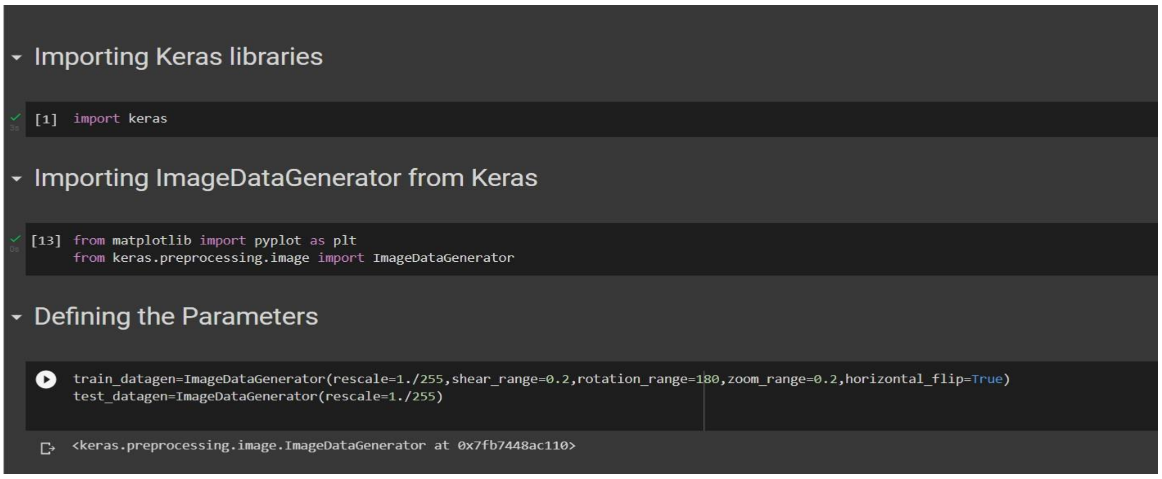
Importing Keras libraries

```
import keras
```

Importing ImageDataGenerator from Keras

```
from keras.preprocessing.image import ImageDataGenerator
```

IMPORTImageDataGenerator FROMKERAS:



Importing Keras libraries

```
[1] import keras
```

Importing ImageDataGenerator from Keras

```
[13] from matplotlib import pyplot as plt
     from keras.preprocessing.image import ImageDataGenerator
```

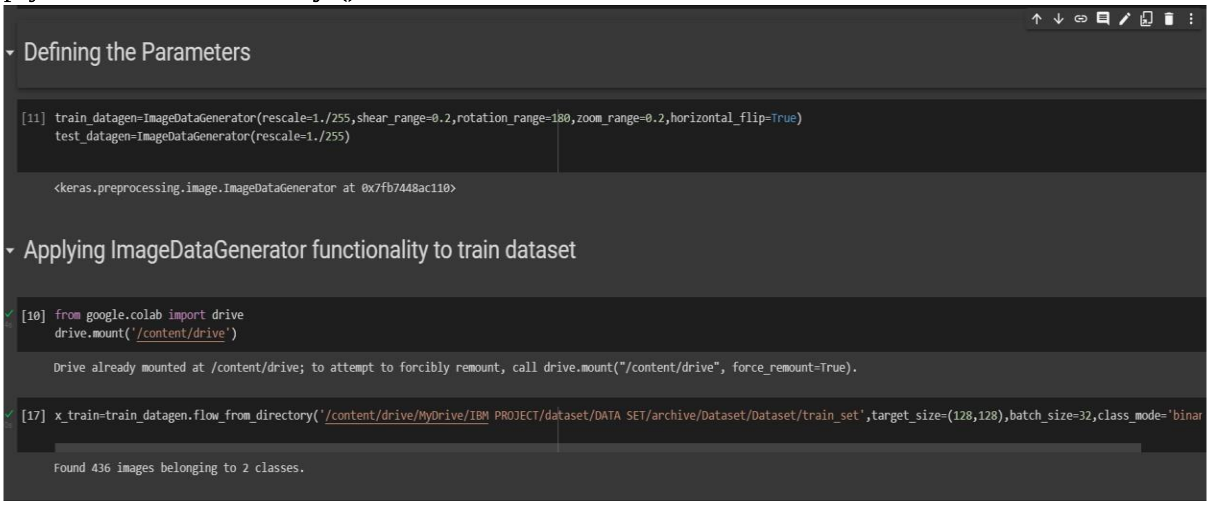
Defining the Parameters

```
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)
```

```
<keras.preprocessing.image.ImageDataGenerator at 0x7fb7448ac110>
```

APPLYINGImageDataGeneratortotraindataset:

ply**flow_from_directory ()**methodforTrainfolder.



Defining the Parameters

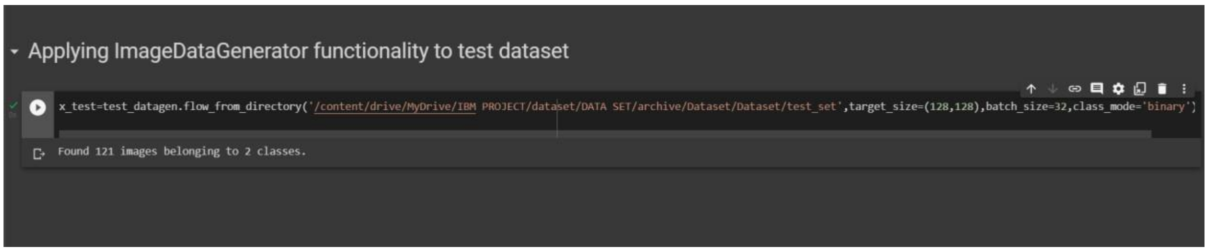
```
[11] train_datagen=ImageDataGenerator(rescale=1./255,shear_range=0.2,rotation_range=180,zoom_range=0.2,horizontal_flip=True)
     test_datagen=ImageDataGenerator(rescale=1./255)

     <keras.preprocessing.image.ImageDataGenerator at 0x7fb7448ac110>
```

Applying ImageDataGenerator functionality to train dataset

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

     Drive already mounted at /content/drive; to attempt to forcibly remount, call drive.mount("/content/drive", force_remount=True).

[17] x_train=train_datagen.flow_from_directory('/content/drive/MyDrive/IBM PROJECT/dataset/DATA SET/archive/Dataset/Dataset/train_set',target_size=(128,128),batch_size=32,class_mode='binar

     Found 436 images belonging to 2 classes.
```

APPLYINGImageDataGeneratortotestdataset:

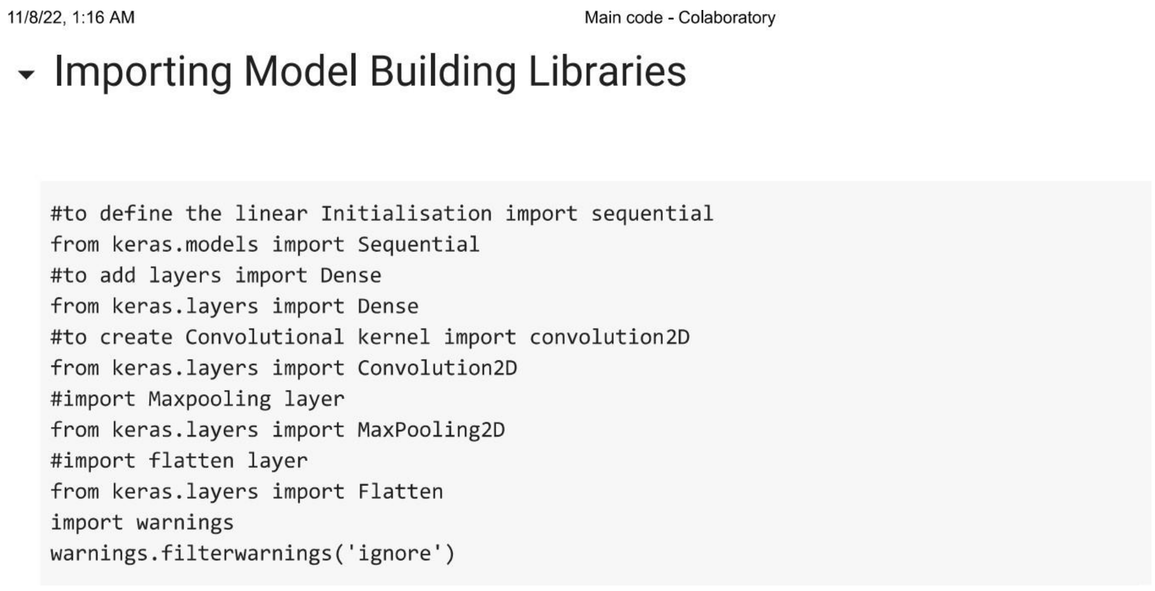
Applyingthe**flow_from_directory()**methodfortestfolder.



Applying ImageDataGenerator functionality to test dataset

```
x_test=test_datagen.flow_from_directory('/content/drive/MyDrive/IBM PROJECT/dataset/DATA SET/archive/Dataset/Dataset/test_set',target_size=(128,128),batch_size=32,class_mode='binary')

Found 121 images belonging to 2 classes.
```

IMPORTINGMODELBUILDINGLIBRARIES:

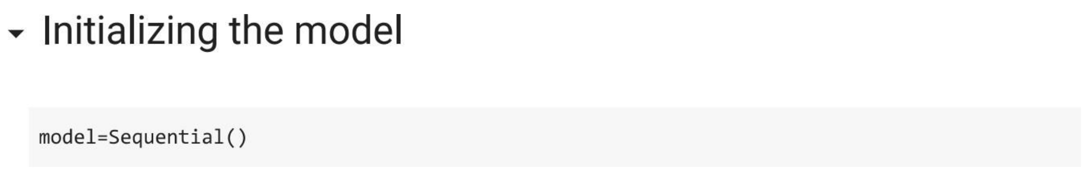


11/8/22, 1:16 AM Main code - Colaboratory

Importing Model Building Libraries

```
#to define the linear Initialisation import sequential
from keras.models import Sequential
#to add layers import Dense
from keras.layers import Dense
#to create Convolutional 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')
```

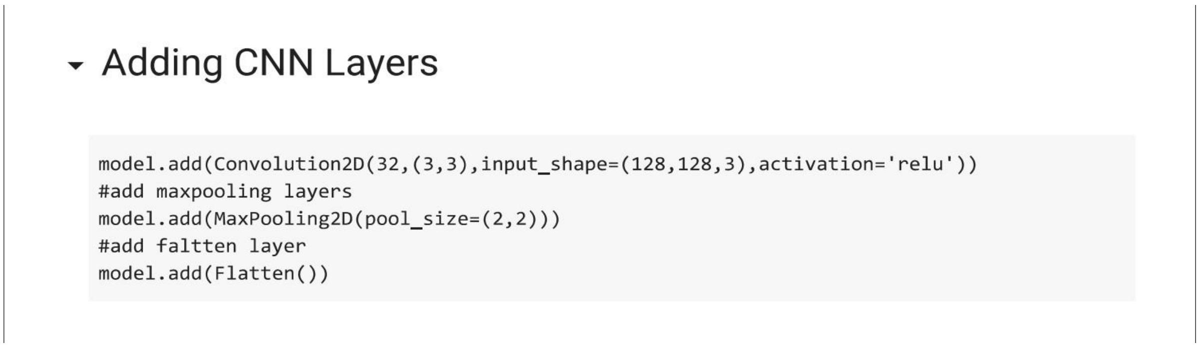
INITIALIZINGTHEMODEL:



▾ Initializing the model

```
model=Sequential()
```

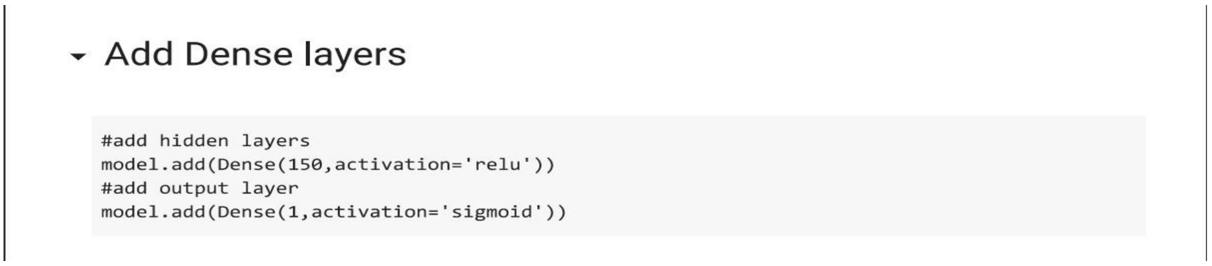
ADDINGCNNLAYERS:



▾ Adding CNN Layers

```
model.add(Convolution2D(32,(3,3),input_shape=(128,128,3),activation='relu'))
#add maxpooling layers
model.add(MaxPooling2D(pool_size=(2,2)))
#add faltten layer
model.add(Flatten())
```

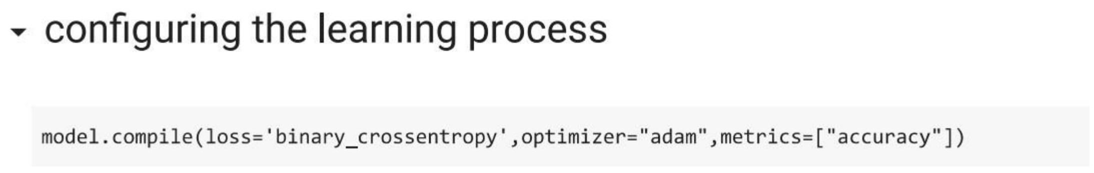
ADDINGDENSELAYERS:



▾ Add Dense layers

```
#add hidden layers
model.add(Dense(150,activation='relu'))
#add output layer
model.add(Dense(1,activation='sigmoid'))
```

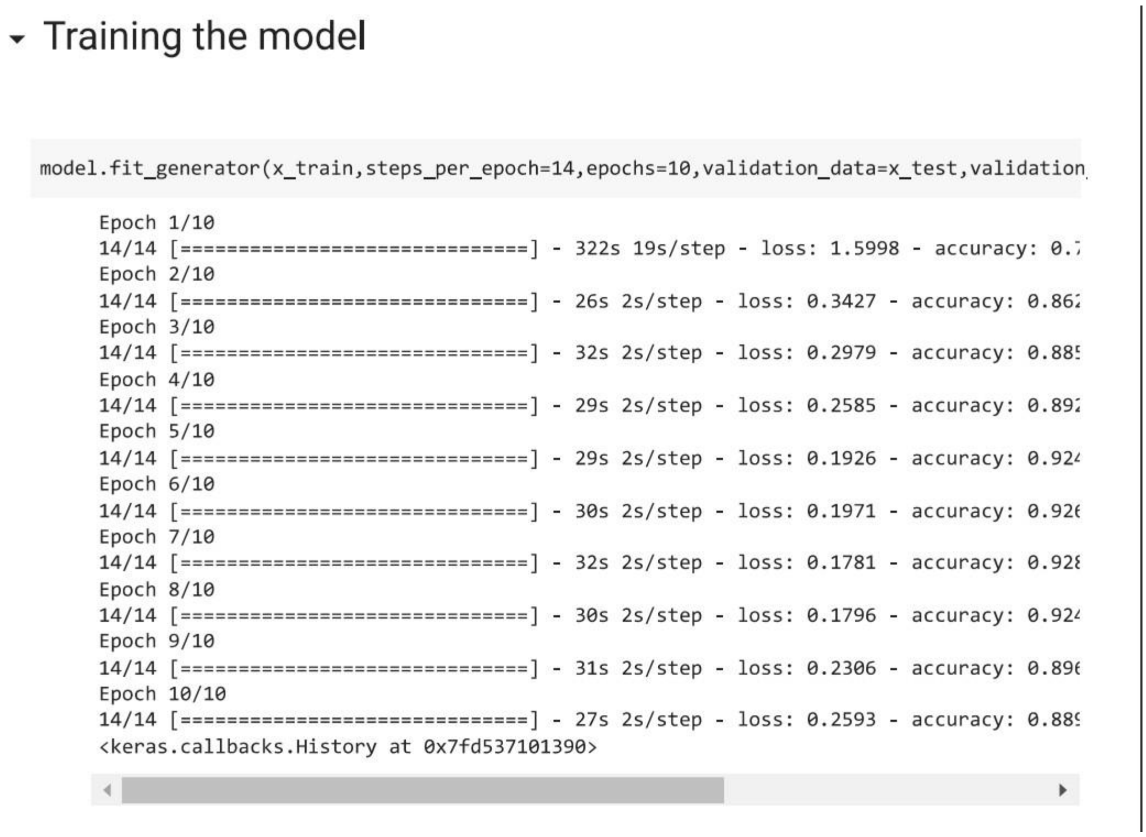
CONFIGURINGTHELEARNING PROCESS:



▾ configuring the learning process

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

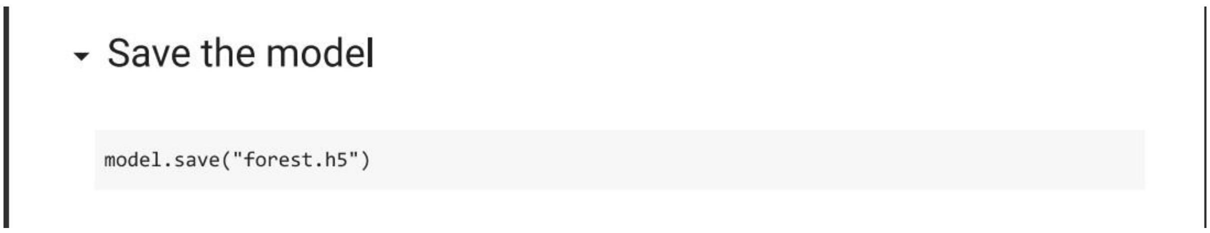
TRAININGTHEMODEL:



Training the model

```
model.fit_generator(x_train,steps_per_epoch=14,epochs=10,validation_data=x_test,validation

    Epoch 1/10
    14/14 [==============================] - 322s 19s/step - loss: 1.5998 - accuracy: 0.7
    Epoch 2/10
    14/14 [==============================] - 26s 2s/step - loss: 0.3427 - accuracy: 0.862
    Epoch 3/10
    14/14 [==============================] - 32s 2s/step - loss: 0.2979 - accuracy: 0.885
    Epoch 4/10
    14/14 [==============================] - 29s 2s/step - loss: 0.2585 - accuracy: 0.892
    Epoch 5/10
    14/14 [==============================] - 29s 2s/step - loss: 0.1926 - accuracy: 0.924
    Epoch 6/10
    14/14 [==============================] - 30s 2s/step - loss: 0.1971 - accuracy: 0.926
    Epoch 7/10
    14/14 [==============================] - 32s 2s/step - loss: 0.1781 - accuracy: 0.928
    Epoch 8/10
    14/14 [==============================] - 30s 2s/step - loss: 0.1796 - accuracy: 0.924
    Epoch 9/10
    14/14 [==============================] - 31s 2s/step - loss: 0.2306 - accuracy: 0.896
    Epoch 10/10
    14/14 [==============================] - 27s 2s/step - loss: 0.2593 - accuracy: 0.889
    <keras.callbacks.History at 0x7fd537101390>
```

SAVETHE MODEL:



Save the model

```
model.save("forest.h5")
```