EARLY DETECTION OF FOREST FIRE USING DEEP LEARNING

MODEL BUILDING

SAVE THE MODEL

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Project Name	Project-Early detection of forest fire using deep learning

SAVE THE MODEL

The model should be saved for future use. This saved model is also integrated into Android applications or web applications to predict anything.IMPORT LIBRARIES:

11/7/22, 12:35 AM

Untitled8.ipynb - Colaboratory

Importing Keras libraries

import keras

Importing ImageDataGenerator from Keras

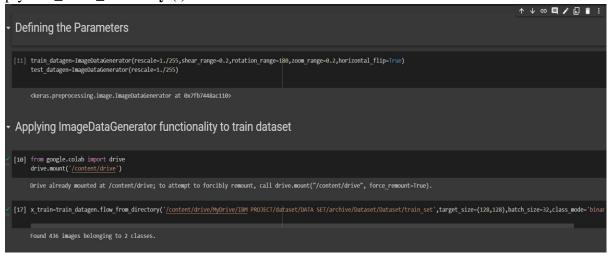
from keras.preprocessing.image import ImageDataGenerator

IMPORT ImageDataGenerator FROM KERAS:

*	Importing Keras libraries	
~	[1] import keras	
•	Importing ImageDataGenerator from Keras	
os.	[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)	
	<pre>c, <keras.preprocessing.image.imagedatagenerator 0x7fb7448ac110="" at=""></keras.preprocessing.image.imagedatagenerator></pre>	

APPLYING ImageDataGenerator to train dataset:

plyflow_from_directory ()methodfor Train folder.



APPLYING ImageDataGenerator to test dataset:

Applying the **flow_from_directory** () methodfortest folder.



IMPORTING MODEL BUILDING LIBRARIES:

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

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')
```

INITIALIZING THE MODEL:

Initializing the model

```
model=Sequential()
```

ADDING CNN LAYERS:

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())
```

ADDING DENSE LAYERS:

Add Dense layers

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

CONFIGURING THE LEARNING PROCESS:

configuring the learning process

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

TRAINING THE MODEL:

Training the model

```
model.fit_generator(x_train,steps_per_epoch=14,epochs=10,validation_data=x_test,validation
  Epoch 1/10
  Epoch 2/10
  Epoch 3/10
  Epoch 4/10
  Epoch 5/10
  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
  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>
```

SAVE THE MODEL:

Save the model

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