EARLY DETECTION OF FOREST FIRE USING DEEP LEARNING

MODEL BUILDING PREDICTIONS

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

PREDICTIONS:

The last and final step is to make use of our saved model to do predictions. For that we have a class in keras called load_model. Load_model is used to load our saved model h5 file (alert.h5).

IMPORT LIBRARIES:

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

Importing Keras libraries

import keras

Importing ImageDataGenerator from Keras

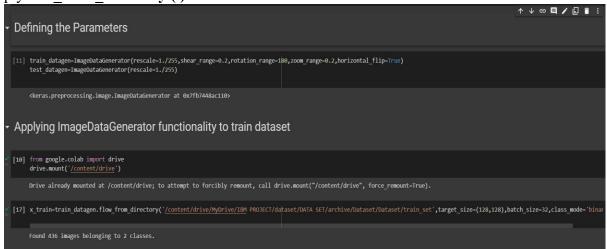
from keras.preprocessing.image import ImageDataGenerator

IMPORT ImageDataGenerator FROM KERAS:

~	lm	porting Keras libraries
~	[1]	import keras
~	lm	porting ImageDataGenerator from Keras
00	[13]	from matplotlib import pyplot as plt from keras.preprocessing.image import ImageDataGenerator
→ Defining the Parameters		
	0	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><keras.preprocessing.image.imagedatagenerator 0x7fb7448ac110="" at=""></keras.preprocessing.image.imagedatagenerator></pre>

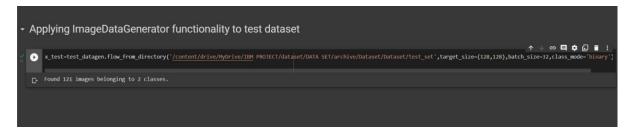
APPLYING ImageDataGenerator to train dataset:

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 - 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')
```

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
   14/14 [==========================] - 322s 19s/step - loss: 1.5998 - accuracy: 0.7
   Epoch 2/10
   Epoch 3/10
   14/14 [=============== ] - 32s 2s/step - loss: 0.2979 - accuracy: 0.885
   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")
```

PREDICTIONS:

Predictions

```
#import load model from keras.model
from keras.models import load_model
#import image from keras
from tensorflow.keras.preprocessing import image
import numpy as np
#import cv2
import cv2
#load the saved model
model=load_model('forest.h5')
img=image.load_img('/content/drive/MyDrive/IBM PROJECT/dataset/DATA SET/archive/Dataset/Da
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)
```