EMERGING METHODS FOR EARLY DETECTION OF FOREST FIRES

MODEL BUILDING

ADDING CNN LAYERS

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Project Name	Emerging Methods for Early Detection of Forest Fires

ADDING CNN LAYERS:

We will be adding three layers for CNN

- Convolution layer
- Pooling layer
- Flattening layer

Adding Convolution Layer:

The convolution layer is the first and core layer of CNN. It is one of the building blocks of a CNN and is used for extracting important features from the image.

The convolution operation involves the input image with a feature detector/filter to get a feature map. The key role of feature detectors is to extract features from images. A set of feature maps is called a feature layer.

In the convolution2D function we provided arguments containing 32(3,3)**.** This means applying 32 filters of 3x3 matrix filters**,** input_shape is the input image shape in RGB**.** where 64x64 is the size and 3 represents the channels**.** RGB color image**.**

Activation features:
These are features that help determine if **a** node should be activated**.** These functions introduce non-linearity into the network**.**

Adding Pooling Layer :

Max Pooling selects the largest elements from the area of the feature map covered by the filter.So the output after the max pooling layer will be a feature map containing the most salient features of the previous feature map.

A pooling layer is added after the convolution layer. You can add a max pooling layer using the MaxPooling2D class. It takes a pool size as a parameter.The effective size of the pooling matrix is (2,2). Returns a pooled feature map. (Note: You can add any number of convolution, pooling**,** and dropout layers.)

In the above code, pool_size refers to pooling filter or kernel size.

Task 3: Adding Flatten Layer
A pooled feature map is transformed from **a** pooling layer to a one-dimensional matrix or map, where each pixel in one column is just flat. A flattening layer transforms a multidimensional matrix into a one-dimensional layer.

IMPORT LIBRARIES:

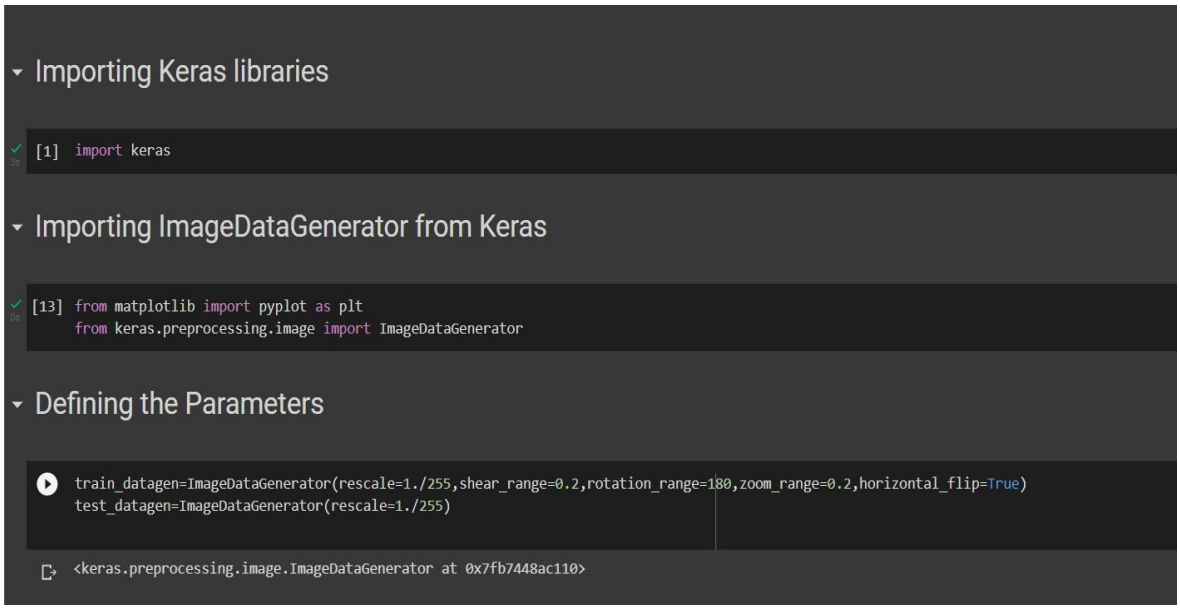
Importing Keras libraries

```
import keras
```

Importing ImageDataGenerator from Keras

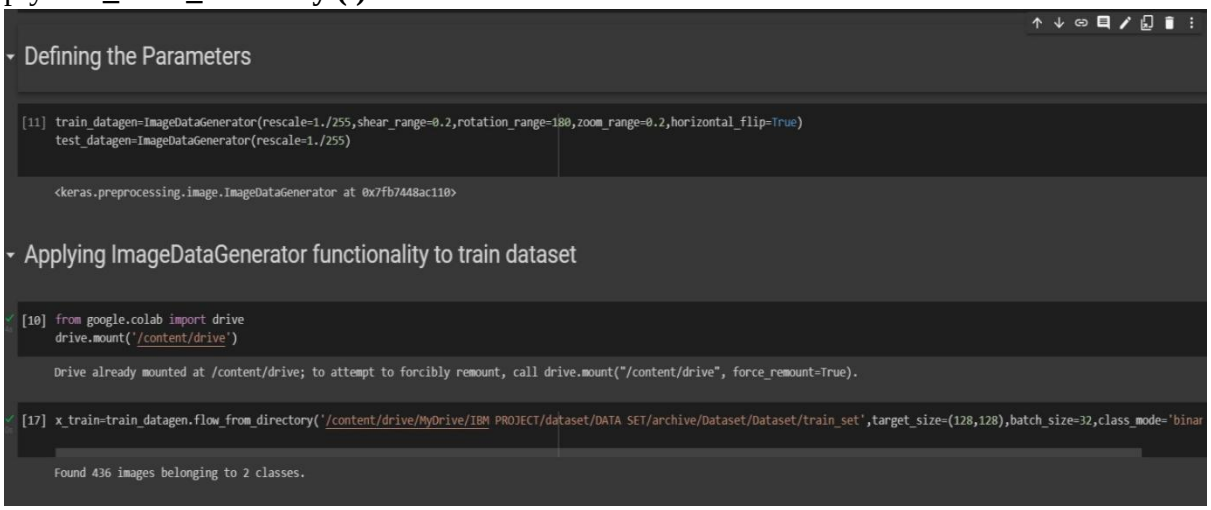
```
from keras.preprocessing.image import ImageDataGenerator
```

IMPORT ImageDataGenerator FROM KERAS:



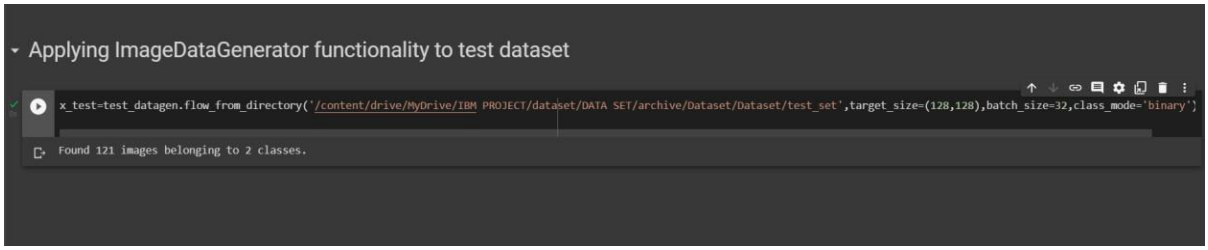
APPLYING ImageDataGenerator to train dataset:

ply**flow_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())
```