## EARLY DETECTION OF FOREST FIRE

## MODEL BUILDING

# TRAINING THE MODEL

Team ID	PNT2022TMID03558
Project Name	Project-Early detection of forest fire using deep learning

## TRAININGTHEMODEL:

At this point, we have training data and a fully configured neural network to train. All that is left is to pass the data to the model for the training process to commence, a process that is completed by iterating on the training data. Training begins by calling the fit ()method.

The arguments are the batch size as you are using "a dam" (bath gradient descent and epochs: no:of times the model should get trained).

steps\_per\_epoch:

- It specifies the total number of steps taken from the generator as soon as one epoch is finished and then extepoch has started. We can calculate the value of steps\_per\_epochas the total number of samples in your training folder divided by the batch size.
- Epochs: an integer and number of epochs we want to train our model for.
- Validation\_datacanbeeitherinputandtargetslistgeneratorinputs,targets,and sample\_weights list which can be used to evaluate.

The loss and metrics for any model after an yepoch has ended.

• Validation\_steps:

Only if the validation\_data is a generator then only this argument can be used. It specifies thetotalnumberofstepstakenfromthegeneratorbeforeitisstoppedateveryepochanditsvalueis calculated as the total number of validation data points in your data set divided by the validation batch size.

#### **IMPORT LIBRARIES:**

11/7/22, 12:35 AM

Untitled8.ipynb - Colaboratory

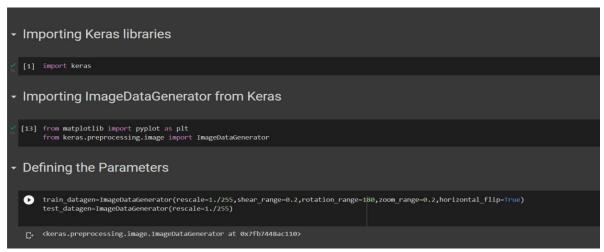
Importing Keras libraries

import keras

Importing ImageDataGenerator from Keras

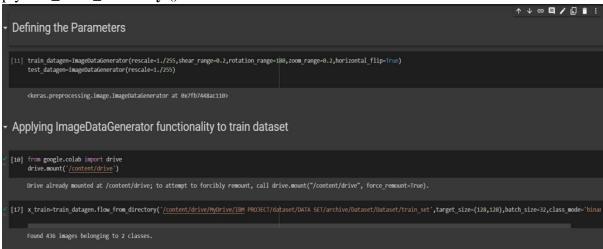
from keras.preprocessing.image import ImageDataGenerator

# **IMPORT Image Data Generator FROMKERAS:**



# **APPLYING Image Data Generator to train dataset:**

plyflow\_from\_directory ()method for Train folder.



# **APPLYING Image Data Generator to test dataset:**

Applying the **flow\_from\_directory()** method for test 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\_data=
           Epoch 2/10
           Epoch 3/10
           Epoch 4/10
           Epoch 5/10
           Epoch 6/10
           Epoch 7/10
           Epoch 9/10
           Epoch 10/10
           14/14 [============== ] - 27s 2s/step - loss: 0.2593 - accuracy: 0.889
           <keras.callbacks.History at 0x7fd537101390>
```