

```
from google.colab import drive
drive.mount('/content/drive/')
Mounted at /content/drive/
```

In [2]:

```
!unzip "/content/drive/MyDrive/dataset1.zip"
Archive: /content/drive/MyDrive/dataset1.zip
  inflating:
Dataset/Dataset/test_set/forest/0.48007200_1530881924_final_forest.jpg
  inflating:
Dataset/Dataset/test_set/forest/0.64133000_1519374442_forest_deep.jpg
  inflating:
Dataset/Dataset/test_set/forest/0.72918000_1559733279_forests1_gettyimages_
.jpg
  inflating: Dataset/Dataset/test_set/forest/0.98884800_1554454572_spin.jpg
  inflating:
Dataset/Dataset/test_set/forest/01_NeilBurnell_Mystical_photoverticall.jpg
  inflating:
Dataset/Dataset/test_set/forest/091318_LH_forest_loss_main_FREE.jpg
  inflating: Dataset/Dataset/test_set/forest/1009821.jpg
  inflating:
Dataset/Dataset/test_set/forest/111188170_river_in_the_mountain_forest.jpg
  inflating: Dataset/Dataset/test_set/forest/1170x500_Ireland_web.jpg
  inflating: Dataset/Dataset/test_set/forest/1200px_Mountainarea.jpg
  inflating: Dataset/Dataset/test_set/forest/146019.jpg
  inflating: Dataset/Dataset/test_set/forest/1506697583544.jpg
  inflating: Dataset/Dataset/test_set/forest/1551622076_img_5241.jpg
  inflating: Dataset/Dataset/test_set/forest/1551903255_2942.jpg
  inflating:
Dataset/Dataset/test_set/forest/1556508284pexels_photo_1179229.jpeg
  inflating:
Dataset/Dataset/test_set/forest/16475617_web1_ForestHealth_VIB_190418_2.jpg
  inflating: Dataset/Dataset/test_set/forest/18435324436_6a20e7fc70_k.jpg
  inflating: Dataset/Dataset/test_set/forest/1_chimp.jpg
  inflating: Dataset/Dataset/test_set/forest/200px_View_of_Lake_Moraine.jpg
  inflating: Dataset/Dataset/test_set/forest/2017_10_12_09_01_56.jpg
  inflating:
Dataset/Dataset/test_set/forest/220px_The_forest_near_Blatets_Vinitsa.JPG
  inflating:
Dataset/Dataset/test_set/forest/23769_pcbkrdoss_1500310327.jpg
  inflating:
Dataset/Dataset/test_set/forest/2E215059_55C7_417B_8DDD693AA6E416B4_source.
.jpg
  inflating: Dataset/Dataset/test_set/forest/31105585103_4c32392ac1_k.jpg
  inflating: Dataset/Dataset/test_set/forest/381417.jpg
  inflating:
Dataset/Dataset/test_set/forest/4632581118_dcfb9ed978_b.jpg.860x0_q70_crop_
scale.jpg
  inflating:
Dataset/Dataset/test_set/forest/4fe3f4e45d6bb93070989b8bbb77d30e.jpg
  inflating:
Dataset/Dataset/test_set/forest/4k_timelapse_heavy_rain_on_mountain_forest_
tree_fog_motion_bad_weather_condition_rfift1zh_thumbnail_.png
  inflating: Dataset/Dataset/test_set/forest/5325.jpg
  inflating: Dataset/Dataset/test_set/forest/5472.jpg
  inflating:
Dataset/Dataset/test_set/forest/559672101517195076987621071193712n.jpg
  inflating:
Dataset/Dataset/test_set/forest/78closer_exterior_view_of_northern_Rocky_Mo
untain_forest.jpg
```

inflating:
Dataset/Dataset/test_set/forest/79806645_landscape_of_tall_grass_field_green_mountain_forest.jpg
inflating:
Dataset/Dataset/test_set/forest/7_18_MedicineBowHikingFishing_KL_1319_4003.jpg
inflating:
Dataset/Dataset/test_set/forest/7ece9530_9cf1_11e9_bf3c_4fe6e6438142.jpg
inflating: Dataset/Dataset/test_set/forest/852554.jpg
inflating: Dataset/Dataset/test_set/forest/91ErlodmE5L.jpg
inflating: Dataset/Dataset/test_set/forest/91sALlLjdLL.jpg
inflating: Dataset/Dataset/test_set/forest/A003_C014_0724EC.0000000.jpg
inflating:
Dataset/Dataset/test_set/forest/Adirondack_Habitats_Mixed_Forest_Barnum_Brook_Trail_Paul_Smiths_VIC_23_May_2012_61.jpg
inflating:
Dataset/Dataset/test_set/forest/Adirondack_Habitats_Mixed_Forest_Jenkins_Mountain_Trail_Paul_Smiths_VIC_12_August_2013_71.jpg
inflating: Dataset/Dataset/test_set/forest/Almaty_Mountains.jpg
inflating: Dataset/Dataset/test_set/forest/DSCN8209(1)_250x333.JPG
inflating: Dataset/Dataset/test_set/forest/DSC_0072_Forest.jpg
inflating: Dataset/Dataset/test_set/forest/Deciduous_forest.jpg
inflating:
Dataset/Dataset/test_set/forest/Dupont_Forest_Triple_Falls_Rob_Travis_2_1.jpg
pg
inflating:
Dataset/Dataset/test_set/forest/Fall_Trees_Alaskan_Adventure_by_John_Simeone.jpg
inflating: Dataset/Dataset/test_set/forest/Fallen_el499694482182.jpg
inflating:
Dataset/Dataset/test_set/forest/_101542074_gettyimages_956391468.jpg
inflating: Dataset/Dataset/test_set/forest/a.jpg
inflating: Dataset/Dataset/test_set/forest/acadia_np_622419_High_Res.jpg
inflating:
Dataset/Dataset/test_set/forest/altai_regio_pine_forest_1550x804.jpg
inflating:
Dataset/Dataset/test_set/forest/amazing_green_trees_in_dense_mountain_forest_nature_landscape_in_4k_aerial_view_b7oqfwutg_thumbnail.png
inflating: Dataset/Dataset/test_set/forest/aokigaharaforest_1_star.jpg
inflating:
Dataset/Dataset/test_set/forest/appalachian_mtns_forest_usda_srs.jpg
inflating:
Dataset/Dataset/test_set/forest/austria_mountain_forest_landscape_wallpaper_1920x1200.jpg
inflating:
Dataset/Dataset/test_set/forest/bavarian_forest_3385966_1280_1.jpg
inflating:
Dataset/Dataset/test_set/forest/beautiful_green_forest_range_images_picture_photos_wallpaper_download.jpg
inflating:
Dataset/Dataset/test_set/forest/beautiful_morning_mountain_forest_scenery_free_stock_photos_picjumbo_DSC02176.jpg
inflating:
Dataset/Dataset/test_set/forest/beautiful_mountain_forest_wallpaper_1920x1200.jpg
inflating: Dataset/Dataset/test_set/forest/beech_oak_forest_560.jpg
inflating: Dataset/Dataset/test_set/forest/britishforest_696483208.jpg
inflating:
Dataset/Dataset/test_set/forest/canva_waterfalls_in_the_mountain_forest_MADR_13e0W4.jpg

inflating:
Dataset/Dataset/test_set/forest/ce8b73d56bd242eb1f2369fe856f1c63_700.jpg
inflating:
Dataset/Dataset/test_set/forest/cold_daylight_environment_1423600_640x427.jpg
inflating: Dataset/Dataset/test_set/forest/easternArc.jpg
inflating:
Dataset/Dataset/test_set/forest/em_tiger_mountain_570x284_nc.jpg
inflating: Dataset/Dataset/test_set/forest/europeslostf.jpg
inflating:
Dataset/Dataset/test_set/forest/fanas_gregorschmucki_2016_28_1_2600x1733.jpg
inflating:
Dataset/Dataset/test_set/forest/fantastic_dark_landscape_of_mountain_forest_in_clouds_fog_or_mist_picture_id688948674.jpg
inflating:
Dataset/Dataset/test_set/forest/fb26e4420f3ae3b12788ffffdea0fb132_full.jpg
inflating:
Dataset/Dataset/test_set/forest/file_20180627_112634_8tdgn4.jpg
inflating: Dataset/Dataset/test_set/with
fire/180802_CarrFire_010_large_700x467.jpg
inflating: Dataset/Dataset/test_set/with fire/19464620_401.jpg
inflating: Dataset/Dataset/test_set/with fire/599857.jpg
inflating: Dataset/Dataset/test_set/with fire/Bandipur_fires_2019.jpg
inflating: Dataset/Dataset/test_set/with fire/FORESTFIRE (1).jpg
inflating: Dataset/Dataset/test_set/with fire/Fire_2_696x392.jpg
inflating: Dataset/Dataset/test_set/with fire/Forest_Fire (3).jpg
inflating: Dataset/Dataset/test_set/with fire/Forest_Fire (4).jpg
inflating: Dataset/Dataset/test_set/with
fire/Forest_fire_MNRF_esize_IMG_6743.jpg
inflating: Dataset/Dataset/test_set/with fire/GettyImages_482867948.0.jpg
inflating: Dataset/Dataset/test_set/with
fire/GettyImages_862092472_1160x773.jpg
inflating: Dataset/Dataset/test_set/with
fire/How_to_Protect_Your_Home_From_Forest_Fire_1024x588.jpg
inflating: Dataset/Dataset/test_set/with fire/RED7_May29_1986.jpg
inflating: Dataset/Dataset/test_set/with
fire/The_Rim_Fire_in_the_Stanislaus_National_Forest_near_in_California_began_on_Aug._17__2013_0004.jpg
inflating: Dataset/Dataset/test_set/with
fire/Untitled_design_161_866x487.jpg
inflating: Dataset/Dataset/test_set/with
fire/Uttarakhand_forest_fire.jpeg
inflating: Dataset/Dataset/test_set/with
fire/Washington_DNR_Chiwaukum_WildFires_2014_2015_WA_DNR_cropped.jpg
inflating: Dataset/Dataset/test_set/with fire/Wild_fires.jpg
inflating: Dataset/Dataset/test_set/with fire/X80IR0GYSsG6RaiLcsXX.jpg
inflating: Dataset/Dataset/test_set/with
fire/b2683a16be44f230a90f50bb944315e994b43042e43df798bb4feaf27e0f8bc8.jpg
inflating: Dataset/Dataset/test_set/with
fire/climate_change_forest_fire.jpeg
inflating: Dataset/Dataset/test_set/with fire/cumming_forest_fires.jpg
inflating: Dataset/Dataset/test_set/with fire/deerfire_high_res_edit.jpg
inflating: Dataset/Dataset/test_set/with fire/defense_large.jpg
inflating: Dataset/Dataset/test_set/with fire/f90_fire_1168x657.jpg
inflating: Dataset/Dataset/test_set/with
fire/file_20190308_155532_1nvt27.jpg
inflating: Dataset/Dataset/test_set/with fire/forest_fire_0.jpg
inflating: Dataset/Dataset/test_set/with
fire/forest_fire_2268729_1280.jpg

inflating: Dataset/Dataset/test_set/with
fire/forest_fire_at_bandipur_tiger_reserve_04f0dd5e_3919_11e9_9798_f85edb62
de22.jpg
inflating: Dataset/Dataset/test_set/with fire/forestfire.jpg
inflating: Dataset/Dataset/test_set/with
fire/forestfire_kApH_621x414_LiveMint.jpg
inflating: Dataset/Dataset/test_set/with
fire/growing_risk_future_wildfires_adobestock_199370851.jpeg
inflating: Dataset/Dataset/test_set/with
fire/header_hypermaritime_fire.jpg
inflating: Dataset/Dataset/test_set/with fire/horseshoe_bay_fire.jpg
inflating: Dataset/Dataset/test_set/with fire/image.jpg
inflating: Dataset/Dataset/test_set/with fire/in_forestfire1_(1).jpg
inflating: Dataset/Dataset/test_set/with fire/in_forestfires_shutter.jpg
inflating: Dataset/Dataset/test_set/with fire/in_forestfiress_(1).jpg
inflating: Dataset/Dataset/test_set/with fire/korea_forest_fire_4.jpg
inflating: Dataset/Dataset/test_set/with fire/louisiana_forest_fire.jpg
inflating: Dataset/Dataset/test_set/with fire/maxresdefault.jpg
inflating: Dataset/Dataset/test_set/with
fire/photo_1555842027_660d9d8df55b.jpg
inflating: Dataset/Dataset/test_set/with
fire/ring_of_fire_bailey_colorado_rocky_mountain_forest_wildfire_picture_id
157384116.jpg
inflating: Dataset/Dataset/test_set/with
fire/rsz_1fire_pix_accumulation_640_1_2.jpg
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inflating: Dataset/Dataset/test_set/with fire/shutterstock_710588224.jpg
inflating: Dataset/Dataset/test_set/with
fire/skynews_ashdown_forest_fire_4653702.jpg
inflating: Dataset/Dataset/test_set/with
fire/uttarakhand_forest_fire_750x500.jpg
inflating: Dataset/Dataset/test_set/with
fire/wildfire_header_image_1024x1024.jpg
inflating: Dataset/Dataset/train_set/forest/with_fire (1).gif
inflating: Dataset/Dataset/train_set/forest/with_fire (1).jpeg
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inflating: Dataset/Dataset/train_set/forest/with_fire (101).jpg
inflating: Dataset/Dataset/train_set/forest/with_fire (102).jpg
inflating: Dataset/Dataset/train_set/forest/with_fire (103).jpg
inflating: Dataset/Dataset/train_set/forest/with_fire (104).jpg
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inflating: Dataset/Dataset/train_set/forest/with_fire (12).jpg

[illegible]

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[illegible]

[illegible]

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[illegible]

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inflating: Dataset/Dataset/train_set/with fire/with fire (61).jpg
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inflating: Dataset/Dataset/train_set/with fire/with fire (70).jpg
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inflating: Dataset/Dataset/train_set/with fire/with fire (89).jpg
inflating: Dataset/Dataset/train_set/with fire/with fire (9).jpg
inflating: Dataset/Dataset/train_set/with fire/with fire (90).jpg
inflating: Dataset/Dataset/train_set/with fire/with fire (91).jpg
inflating: Dataset/Dataset/train_set/with fire/with fire (92).jpg
inflating: Dataset/Dataset/train_set/with fire/with fire (93).jpg
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inflating: Dataset/Dataset/train_set/with fire/with fire (98).jpg
inflating: Dataset/Dataset/train_set/with fire/with fire (99).jpg
inflating: Dataset/Dataset/train_set/with fire/with fire.jpeg
inflating: forest1.h5

```

In [3]:

```

!pip install tensorflow
!pip install opencv-python
!pip install opencv-contrib-python
import tensorflow as tf
import numpy as np
from tensorflow import keras
import os
import cv2
from tensorflow.keras.preprocessing.image import ImageDataGenerator
from tensorflow.keras.preprocessing import image

Looking in indexes: https://pypi.org/simple, https://us-
python.pkg.dev/colab-wheels/public/simple/
Requirement already satisfied: tensorflow in /usr/local/lib/python3.7/dist-
packages (2.9.2)
Requirement already satisfied: opt-einsum>=2.3.2 in
/usr/local/lib/python3.7/dist-packages (from tensorflow) (3.3.0)

```

Requirement already satisfied: wrapt>=1.11.0 in
/usr/local/lib/python3.7/dist-packages (from tensorflow) (1.14.1)
Requirement already satisfied: astunparse>=1.6.0 in
/usr/local/lib/python3.7/dist-packages (from tensorflow) (1.6.3)
Requirement already satisfied: numpy>=1.20 in
/usr/local/lib/python3.7/dist-packages (from tensorflow) (1.21.6)
Requirement already satisfied: six>=1.12.0 in
/usr/local/lib/python3.7/dist-packages (from tensorflow) (1.15.0)
Requirement already satisfied: keras<2.10.0,>=2.9.0rc0 in
/usr/local/lib/python3.7/dist-packages (from tensorflow) (2.9.0)
Requirement already satisfied: absl-py>=1.0.0 in
/usr/local/lib/python3.7/dist-packages (from tensorflow) (1.3.0)
Requirement already satisfied: termcolor>=1.1.0 in
/usr/local/lib/python3.7/dist-packages (from tensorflow) (2.0.1)
Requirement already satisfied: flatbuffers<2,>=1.12 in
/usr/local/lib/python3.7/dist-packages (from tensorflow) (1.12)
Requirement already satisfied: packaging in /usr/local/lib/python3.7/dist-
packages (from tensorflow) (21.3)
Requirement already satisfied: gast<=0.4.0,>=0.2.1 in
/usr/local/lib/python3.7/dist-packages (from tensorflow) (0.4.0)
Requirement already satisfied: typing-extensions>=3.6.6 in
/usr/local/lib/python3.7/dist-packages (from tensorflow) (4.1.1)
Requirement already satisfied: tensorflow-estimator<2.10.0,>=2.9.0rc0 in
/usr/local/lib/python3.7/dist-packages (from tensorflow) (2.9.0)
Requirement already satisfied: protobuf<3.20,>=3.9.2 in
/usr/local/lib/python3.7/dist-packages (from tensorflow) (3.17.3)
Requirement already satisfied: grpcio<2.0,>=1.24.3 in
/usr/local/lib/python3.7/dist-packages (from tensorflow) (1.50.0)
Requirement already satisfied: google-pasta>=0.1.1 in
/usr/local/lib/python3.7/dist-packages (from tensorflow) (0.2.0)
Requirement already satisfied: setuptools in /usr/local/lib/python3.7/dist-
packages (from tensorflow) (57.4.0)
Requirement already satisfied: libclang>=13.0.0 in
/usr/local/lib/python3.7/dist-packages (from tensorflow) (14.0.6)
Requirement already satisfied: keras-preprocessing>=1.1.1 in
/usr/local/lib/python3.7/dist-packages (from tensorflow) (1.1.2)
Requirement already satisfied: h5py>=2.9.0 in
/usr/local/lib/python3.7/dist-packages (from tensorflow) (3.1.0)
Requirement already satisfied: tensorboard<2.10,>=2.9 in
/usr/local/lib/python3.7/dist-packages (from tensorflow) (2.9.1)
Requirement already satisfied: tensorflow-io-gcs-filesystem>=0.23.1 in
/usr/local/lib/python3.7/dist-packages (from tensorflow) (0.27.0)
Requirement already satisfied: wheel<1.0,>=0.23.0 in
/usr/local/lib/python3.7/dist-packages (from astunparse>=1.6.0->tensorflow)
(0.37.1)
Requirement already satisfied: cached-property in
/usr/local/lib/python3.7/dist-packages (from h5py>=2.9.0->tensorflow)
(1.5.2)
Requirement already satisfied: tensorboard-data-server<0.7.0,>=0.6.0 in
/usr/local/lib/python3.7/dist-packages (from tensorboard<2.10,>=2.9-
>tensorflow) (0.6.1)
Requirement already satisfied: markdown>=2.6.8 in
/usr/local/lib/python3.7/dist-packages (from tensorboard<2.10,>=2.9-
>tensorflow) (3.4.1)
Requirement already satisfied: google-auth<3,>=1.6.3 in
/usr/local/lib/python3.7/dist-packages (from tensorboard<2.10,>=2.9-
>tensorflow) (1.35.0)
Requirement already satisfied: tensorboard-plugin-wit>=1.6.0 in
/usr/local/lib/python3.7/dist-packages (from tensorboard<2.10,>=2.9-
>tensorflow) (1.8.1)

Requirement already satisfied: google-auth-oauthlib<0.5,>=0.4.1 in
/usr/local/lib/python3.7/dist-packages (from tensorboard<2.10,>=2.9->tensorflow) (0.4.6)

Requirement already satisfied: requests<3,>=2.21.0 in
/usr/local/lib/python3.7/dist-packages (from tensorboard<2.10,>=2.9->tensorflow) (2.23.0)

Requirement already satisfied: werkzeug>=1.0.1 in
/usr/local/lib/python3.7/dist-packages (from tensorboard<2.10,>=2.9->tensorflow) (1.0.1)

Requirement already satisfied: cachetools<5.0,>=2.0.0 in
/usr/local/lib/python3.7/dist-packages (from google-auth<3,>=1.6.3->tensorboard<2.10,>=2.9->tensorflow) (4.2.4)

Requirement already satisfied: pyasn1-modules>=0.2.1 in
/usr/local/lib/python3.7/dist-packages (from google-auth<3,>=1.6.3->tensorboard<2.10,>=2.9->tensorflow) (0.2.8)

Requirement already satisfied: rsa<5,>=3.1.4 in
/usr/local/lib/python3.7/dist-packages (from google-auth<3,>=1.6.3->tensorboard<2.10,>=2.9->tensorflow) (4.9)

Requirement already satisfied: requests-oauthlib>=0.7.0 in
/usr/local/lib/python3.7/dist-packages (from google-auth-oauthlib<0.5,>=0.4.1->tensorboard<2.10,>=2.9->tensorflow) (1.3.1)

Requirement already satisfied: importlib-metadata>=4.4 in
/usr/local/lib/python3.7/dist-packages (from markdown>=2.6.8->tensorboard<2.10,>=2.9->tensorflow) (4.13.0)

Requirement already satisfied: zipp>=0.5 in /usr/local/lib/python3.7/dist-packages (from importlib-metadata>=4.4->markdown>=2.6.8->tensorboard<2.10,>=2.9->tensorflow) (3.10.0)

Requirement already satisfied: pyasn1<0.5.0,>=0.4.6 in
/usr/local/lib/python3.7/dist-packages (from pyasn1-modules>=0.2.1->google-auth<3,>=1.6.3->tensorboard<2.10,>=2.9->tensorflow) (0.4.8)

Requirement already satisfied: certifi>=2017.4.17 in
/usr/local/lib/python3.7/dist-packages (from requests<3,>=2.21.0->tensorboard<2.10,>=2.9->tensorflow) (2022.9.24)

Requirement already satisfied: chardet<4,>=3.0.2 in
/usr/local/lib/python3.7/dist-packages (from requests<3,>=2.21.0->tensorboard<2.10,>=2.9->tensorflow) (3.0.4)

Requirement already satisfied: idna<3,>=2.5 in
/usr/local/lib/python3.7/dist-packages (from requests<3,>=2.21.0->tensorboard<2.10,>=2.9->tensorflow) (2.10)

Requirement already satisfied: urllib3!=1.25.0,!1.25.1,<1.26,>=1.21.1 in
/usr/local/lib/python3.7/dist-packages (from requests<3,>=2.21.0->tensorboard<2.10,>=2.9->tensorflow) (1.24.3)

Requirement already satisfied: oauthlib>=3.0.0 in
/usr/local/lib/python3.7/dist-packages (from requests-oauthlib>=0.7.0->google-auth-oauthlib<0.5,>=0.4.1->tensorboard<2.10,>=2.9->tensorflow) (3.2.2)

Requirement already satisfied: pyparsing!=3.0.5,>=2.0.2 in
/usr/local/lib/python3.7/dist-packages (from packaging->tensorflow) (3.0.9)

Looking in indexes: <https://pypi.org/simple>, <https://us-python.pkg.dev/colab-wheels/public/simple/>

Requirement already satisfied: opencv-python in
/usr/local/lib/python3.7/dist-packages (4.6.0.66)

Requirement already satisfied: numpy>=1.14.5 in
/usr/local/lib/python3.7/dist-packages (from opencv-python) (1.21.6)

Looking in indexes: <https://pypi.org/simple>, <https://us-python.pkg.dev/colab-wheels/public/simple/>

Requirement already satisfied: opencv-contrib-python in
/usr/local/lib/python3.7/dist-packages (4.6.0.66)

Requirement already satisfied: numpy>=1.14.5 in
/usr/local/lib/python3.7/dist-packages (from opencv-contrib-python) (1.21.6)

In [4]:

```
train=ImageDataGenerator(rescale=1./255,
                        shear_range=0.2,
                        rotation_range=180,
                        zoom_range=0.2,
                        horizontal_flip=True)
train = ImageDataGenerator(rescale=1/255)
test = ImageDataGenerator(rescale=1/255)
```

In [5]:

```
train_dataset =
train.flow_from_directory("/content/drive/MyDrive/dataset/Dataset/Dataset/t
rain_set",
                        target_size=(128,128),
                        batch_size = 32,
                        class_mode = 'binary' )
```

Found 436 images belonging to 2 classes.

In [6]:

```
test_dataset =
test.flow_from_directory("/content/drive/MyDrive/dataset/Dataset/Dataset/te
st_set",
                        target_size=(128,128),
                        batch_size = 32,
                        class_mode = 'binary' )
```

Found 121 images belonging to 2 classes.

In [7]:

```
test_dataset.class_indices
```

Out[7]:

```
{'forest': 0, 'with fire': 1}
```

In [8]:

```
#to define linear initialisation import sequential
from keras.models import Sequential
#to add layer import Dense
from keras.layers import Dense
#to create convolution 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')
```

In [9]:

```
model = keras.Sequential()
model.add(Convolution2D(32, (3,3), input_shape=(128,128,3), activation='relu')
)
model.add(MaxPooling2D(pool_size=(2,2)))
model.add(Convolution2D(32, (3,3), activation='relu'))
model.add(MaxPooling2D(pool_size=(2,2)))
model.add(Convolution2D(32, (3,3), activation='relu'))
model.add(MaxPooling2D(pool_size=(2,2)))
model.add(Convolution2D(32, (3,3), activation='relu'))
model.add(MaxPooling2D(pool_size=(2,2)))
model.add(Flatten())
```

In [10]:

```
model.add(Dense(150, activation='relu'))
```

```
model.add(Dense(1, activation='sigmoid'))
```

In [11]:

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

In [12]:

```
r = model.fit(train_dataset, epochs = 5, validation_data = test_dataset)
```

Epoch 1/5

```
14/14 [=====] - 245s 18s/step - loss: 0.5671 - accuracy: 0.7041 - val_loss: 0.2801 - val_accuracy: 0.9421
```

Epoch 2/5

```
14/14 [=====] - 30s 2s/step - loss: 0.3847 - accuracy: 0.8280 - val_loss: 0.2640 - val_accuracy: 0.8678
```

Epoch 3/5

```
14/14 [=====] - 27s 2s/step - loss: 0.3057 - accuracy: 0.8486 - val_loss: 0.1880 - val_accuracy: 0.9504
```

Epoch 4/5

```
14/14 [=====] - 29s 2s/step - loss: 0.2268 - accuracy: 0.9174 - val_loss: 0.0659 - val_accuracy: 1.0000
```

Epoch 5/5

```
14/14 [=====] - 27s 2s/step - loss: 0.1779 - accuracy: 0.9427 - val_loss: 0.0386 - val_accuracy: 0.9917
```

In [13]:

```
predictions = model.predict(test_dataset)
```

```
predictions = np.round(predictions)
```

```
4/4 [=====] - 5s 1s/step
```

In [14]:

```
predictions
```

Out[14]:

```
array([[0.],
       [0.],
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       [0.],
       [0.],
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```

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```

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[1.]], dtype=float32)

print(len(predictions))
121

model.save("forest2.h5")

#import load_model from keras.model
from keras.models import load_model
#import image class from keras
import tensorflow as tf
from tensorflow.keras.preprocessing import image
#import numpy
import numpy as np
#import cv2
import cv2

model = load_model("forest2.h5")

def predictImage(filename):
    img1 = image.load_img(filename,target_size=(128,128))
    Y = image.img_to_array(img1)
    X = np.expand_dims(Y,axis=0)
    val = model.predict(X)
    print(val)
    if val == 1:
        print(" fire")
    elif val == 0:
        print("no fire")

predictImage("/content/ff2.jpg")

```

In [15]:

In [16]:

In [17]:

In [18]:

In [19]:

In [22]:

In [23]:

In [24]:

In [25]:

```
#import opencv librariiy
import cv2
#import numpy
import numpy as np
#import image function from keras
from keras.preprocessing import image
#import load_model from keras
from keras.models import load_model
#import client from twilio API
from twilio.rest import Client
#imort playsound package
from playsound import playsound
```

WARNING:playsound:playsound is relying on another python subprocess. Please use `pip install pygobject` if you want playsound to run more efficiently.

In [38]:

```
#load the saved model
model = load_model(r'forest2.h5')
#define video
video = cv2.VideoCapture('/content/Fighting Fire with Fire _ Explained in
30 Seconds.mp4')
#define the features
name = ['forest','with forest']
```

In [34]:

```
account_sid = 'AC1a5f39010ff28fb1d8407e86df2e2bde'
auth_token = '6d9eaf657223402abe3b69ab5ead5122'
client = Client(account_sid, auth_token)
```

```
message = client.messages \
    .create(
        body='Forest fire is detected , stay alert',
        from_='+12183044047',
        to='+917094810572'
    )
```

```
print(message.sid)
SM84110c6c51611aca506fe559f0426ad8
```

In [53]:

```
#import opencv library
import cv2
#import numpy
import numpy as np
#import images and load_model function from keras
from keras_preprocessing import image
from keras.models import load_model
#import client from twilio API
from twilio.rest import Client
#import playsound package
from playsound import playsound

#load the saved model
model = load_model(r'forest1.h5')
video = cv2.VideoCapture('/content/Fighting Fire with Fire _ Explained in
30 Seconds.mp4')
name = ['forest','with fire']
```