In [1]:
```
import keras
from keras.preprocessing.image import ImageDataGenerator
```

In [2]:
```
#Define the parameters/arguments for ImageDataGenerator class
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)
```

In [6]:
```
#Applying ImageDataGenerator functionality to trainset
x_train=train_datagen.flow_from_directory('/content/Dataset/Dataset/train_set',target_size=(128,128),batch_size=32,class_mode='binary')
```

```
Found 436 images belonging to 2 classes.
```

In [7]:
```
#Applying ImageDataGenerator functionality to testset
x_test=test_datagen.flow_from_directory('/content/Dataset/Dataset/test_set',target_size=(128,128),batch_size=32,class_mode='binary')
```

```
Found 121 images belonging to 2 classes.
```

In [8]:
```
#import model building libraries

#To define Linear initialisation import Sequential
from keras.models import Sequential
#To add layers 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]:
```
#initializing the model
model=Sequential()
```

In [10]:
```
#add convolutional layer
model.add(Convolution2D(32,(3,3),input_shape=(128,128,3),activation='relu'))
#add maxpooling layer
model.add(MaxPooling2D(pool_size=(2,2)))
#add flatten layer
model.add(Flatten())
```

In [11]:
```
#add hidden layer
model.add(Dense(150,activation='relu'))
#add output layer
model.add(Dense(1,activation='sigmoid'))
```

In [12]:
```
#configure the learning process
model.compile(loss='binary_crossentropy',optimizer="adam",metrics=["accuracy"])
```

In [13]:
```
#Training the model
model.fit_generator(x_train,steps_per_epoch=14,epochs=10,validation_data=x_test,validation_steps=4)
```

```
Epoch 1/10
14/14 [==============================] - 29s 2s/step - loss: 2.1856 - accuracy: 0.7156 - val_loss: 0.3046 - val_accuracy: 0.9256
Epoch 2/10
14/14 [==============================] - 25s 2s/step - loss: 0.3005 - accuracy: 0.8899 - val_loss: 0.0900 - val_accuracy: 0.9669
Epoch 3/10
14/14 [==============================] - 24s 2s/step - loss: 0.3225 - accuracy: 0.8830 - val_loss: 0.0665 - val_accuracy: 0.9752
Epoch 4/10
14/14 [==============================] - 25s 2s/step - loss: 0.2286 - accuracy: 0.9083 - val_loss: 0.0653 - val_accuracy: 0.9835
Epoch 5/10
14/14 [==============================] - 24s 2s/step - loss: 0.2062 - accuracy: 0.9106 - val_loss: 0.0727 - val_accuracy: 0.9752
Epoch 6/10
14/14 [==============================] - 24s 2s/step - loss: 0.1593 - accuracy: 0.9335 - val_loss: 0.0804 - val_accuracy: 0.9669
Epoch 7/10
14/14 [==============================] - 24s 2s/step - loss: 0.1552 - accuracy: 0.9335 - val_loss: 0.0777 - val_accuracy: 0.9669
Epoch 8/10
14/14 [==============================] - 24s 2s/step - loss: 0.1445 - accuracy: 0.9335 - val_loss: 0.0795 - val_accuracy: 0.9669
```

```
Epoch 9/10
14/14 [==============================] - 24s 2s/step - loss: 0.1577 - accuracy: 0.9381 - val_loss: 0.0851 - val_accuracy: 0.9752
Epoch 10/10
14/14 [==============================] - 24s 2s/step - loss: 0.1690 - accuracy: 0.9289 - val_loss: 0.0647 - val_accuracy: 0.9752
```

Out[13]:

In [14]:
```
model.save("forest1.h5")
```

In [59]:
```
#import load_model from keras.model
from keras.models import load_model
#import image class from keras
from tensorflow.keras.preprocessing import image
#import numpy
import numpy as np
#import cv2
import cv2
```

In [60]:
```
#load the saved model
model = load_model("forest1.h5")
```

In [63]:
```
img=image.load_img('/content/Dataset/Dataset/test_set/with fire/180802_CarrFire_010_large_700x467.jpg')
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)
```

In [71]:
```
pred=model.predict(x)
```

```
1/1 [==============================] - 0s 37ms/step
```

In [72]:
```
pred
```

Out[72]:
```
array([[1.]], dtype=float32)
```

In [ ]: