```
In [8]: import keras
        from keras.preprocessing.image import ImageDataGenerator
```

```
In [14]: from keras.models import load_model
         from keras.layers import Lambda
         import tensorflow as tf
```

```
In [22]: tf.keras.preprocessing.image_dataset_from_directory(
             directory="C:\\Users\\Akash\\Downloads\\Dataset",
             labels="inferred",
             label_mode="int",
             class_names=None,
             color_mode="rgb",
             batch_size=32,
             image_size=(256, 256),
             shuffle=True,
             seed=None,
             validation_split=None,
             subset=None,
             interpolation="bilinear",
             follow_links=False,
             crop_to_aspect_ratio=False,
         )
```

Found 558 files belonging to 1 classes.

Out[22]: <BatchDataset element_spec=(TensorSpec(shape=(None, 256, 256, 3), dtype=tf.float32, name=None), TensorSpec(shape=(None,), dtype=tf.int32, name=None))>

```
In [58]: tf.keras.preprocessing.image.load_img(
             path="C:\\Users\\Akash\\Downloads\\Dataset\\Dataset\\train_set\\forest\\with_fire (1).gif", grayscale=False, color_mode="rgb"
         )
```

```
In [10]: 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 [21]: #: Applying ImageDataGenerator functionality to trainset.
         x_train = train_datagen.flow_from_directory(r'C:\Users\Akash\Downloads\Dataset\Dataset\train_set',
                                                      target_size = (128,128),
                                                      batch_size = 32,
                                                      class_mode= 'binary')
```

Found 436 images belonging to 2 classes.

```
In [22]: x_test = test_datagen.flow_from_directory(r'C:\Users\Akash\Downloads\Dataset\Dataset\test_set',
                                                    target_size = (128,128),
                                                    batch_size = 32,
                                                    class_mode= 'binary')
```

Found 121 images belonging to 2 classes.

```
In [23]: from keras.models import Sequential
         from keras.layers import Convolution2D,MaxPooling2D,Dense,Flatten
         import warnings
         warnings.filterwarnings('ignore')
```

```
In [24]: model = Sequential()
         model.add(Convolution2D(32,(3,3),input_shape=(128,128,3),activation='relu'))
         model.add(MaxPooling2D(pool_size=(2,2)))
         model.add(Flatten())
         model.add(Dense(units=256,activation='relu'))
         model.add(Dense(units=1,activation='sigmoid'))
         model.summary()
```

```
Epoch 1/10
14/14 [==============================] - 60s 4s/step - loss: 3.7004 - accuracy: 0.6674 - mse: 0.2822 - val_loss: 0.4052 - val_a
ccuracy: 0.9174 - val_mse: 0.0760
Epoch 2/10
14/14 [==============================] - 42s 3s/step - loss: 0.3510 - accuracy: 0.8739 - mse: 0.0887 - val_loss: 0.2228 - val_a
ccuracy: 0.9587 - val_mse: 0.0375
Epoch 3/10
14/14 [==============================] - 46s 3s/step - loss: 0.2168 - accuracy: 0.9243 - mse: 0.0582 - val_loss: 0.1112 - val_a
ccuracy: 0.9587 - val_mse: 0.0278
Epoch 4/10
14/14 [==============================] - 35s 3s/step - loss: 0.1760 - accuracy: 0.9358 - mse: 0.0494 - val_loss: 0.0607 - val_a
ccuracy: 0.9587 - val_mse: 0.0197
Epoch 5/10
14/14 [==============================] - 37s 3s/step - loss: 0.1988 - accuracy: 0.9128 - mse: 0.0621 - val_loss: 0.0753 - val_a
ccuracy: 0.9752 - val_mse: 0.0229
Epoch 6/10
14/14 [==============================] - 37s 3s/step - loss: 0.1705 - accuracy: 0.9197 - mse: 0.0540 - val_loss: 0.0659 - val_a
ccuracy: 0.9752 - val_mse: 0.0203
Epoch 7/10
14/14 [==============================] - 36s 3s/step - loss: 0.1686 - accuracy: 0.9220 - mse: 0.0526 - val_loss: 0.0701 - val_a
ccuracy: 0.9752 - val_mse: 0.0214
Epoch 8/10
14/14 [==============================] - 37s 3s/step - loss: 0.1564 - accuracy: 0.9381 - mse: 0.0493 - val_loss: 0.0773 - val_a
ccuracy: 0.9752 - val_mse: 0.0238
Epoch 9/10
14/14 [==============================] - 47s 3s/step - loss: 0.1739 - accuracy: 0.9358 - mse: 0.0507 - val_loss: 0.0990 - val_a
ccuracy: 0.9752 - val_mse: 0.0273
Epoch 10/10
14/14 [==============================] - 48s 3s/step - loss: 0.1718 - accuracy: 0.9266 - mse: 0.0523 - val_loss: 0.0545 - val_a
ccuracy: 0.9835 - val_mse: 0.0162
```

Out[31]: <keras.callbacks.History at 0x161007b09d0>

In [32]: `model.save("forest1.h5")`