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

```
Mounted at /content/drive
```

ASSIGNMENT 3, NAME: SENTHIL KUMARAN V, ROLL NUMBER: 110819104032

```
ls
```

```
drive/  sample_data/
```

```
cd /content/drive/MyDrive/NalayaThiran/images
```

```
/content/drive/MyDrive/NalayaThiran/images
```

```
pwd
```

```
'/content/drive/MyDrive/NalayaThiran/images'
```

```
!unzip flowers.zip
```

```
Archive:  flowers.zip
  inflating: images/flower1.jpeg
  inflating: images/flower2.jpeg
  inflating: images/flower3.jpeg
  inflating: images/flower4.jpeg
  inflating: images/flower5.jpeg
```

Saving...

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

```
train_datagen = ImageDataGenerator(rescale = 1./255,zoom_range= 0.3,horizontal_flip=True,vertical_flip=True)
```

```
test_datagen = ImageDataGenerator(rescale = 1./255)
```

```
x_train = train_datagen.flow_from_directory(r"/content/drive/MyDrive/NalayaThiran/images",target_size= (64,64),class_mode= "categoric
```

```
    Found 5 images belonging to 1 classes.
```

```
x_test = test_datagen.flow_from_directory(r"/content/drive/MyDrive/NalayaThiran/images",target_size= (64,64),class_mode= "categorical
```

```
    Found 5 images belonging to 1 classes.
```

```
x_train.class_indices
```

```
    {'images': 0}
```

```
from tensorflow.keras.models import Sequential
from tensorflow.keras.layers import Dense,Convolution2D,MaxPooling2D,Flatten
```

```
model = Sequential()
```

```
model.add(Convolution2D(32,(3,3),activation="relu",strides=(1, 1),input_shape =(64,64,3)))
```

```
model.add(MaxPooling2D(strides=(1, 1)))
```

```
model.add(Flatten())
```

Saving...

```
model.summary()
```

```
Model: "sequential"
_________________________________________________________________
 Layer (type)                Output Shape              Param #
=================================================================
 conv2d (Conv2D)             (None, 62, 62, 32)        896

 conv2d_1 (Conv2D)           (None, 60, 60, 32)        9248

 max_pooling2d (MaxPooling2D  (None, 59, 59, 32)       0
 )

 flatten (Flatten)           (None, 111392)            0

=================================================================
Total params: 10,144
Trainable params: 10,144
Non-trainable params: 0
_________________________________________________________________
```

```
model.add(Dense(300,activation="relu"))
model.add(Dense(300,activation="relu"))


model.add(Dense(5,activation="softmax"))


model.compile(loss = "categorical_crossentropy",optimizer="adam",metrics=["accuracy"])


len(x_train)
```

```
1
```

```
model.fit(x_train,epochs = 10,steps_per_epoch=len(x_train),validation_data=x_test,validation_steps=len(x_test))
```



```
1/1 [==============================] - 2s 2s/step - loss: 8.0900 - accuracy: 0.0000e+00 - val_loss: 25.2246 - val_accuracy: 0.0
Epoch 2/10
1/1 [==============================] - 1s 650ms/step - loss: 22.6399 - accuracy: 0.0000e+00 - val_loss: 45.3184 - val_accuracy:
```

```
Epoch 3/10
1/1 [==============================] - 1s 639ms/step - loss: 45.6417 - accuracy: 1.0000 - val_loss: 70.7722 - val_accuracy: 0.0
Epoch 4/10
1/1 [==============================] - 1s 655ms/step - loss: 61.9453 - accuracy: 0.0000e+00 - val_loss: 98.8670 - val_accuracy:
Epoch 5/10
1/1 [==============================] - 1s 628ms/step - loss: 99.7081 - accuracy: 0.0000e+00 - val_loss: 148.1156 - val_accuracy
Epoch 6/10
1/1 [==============================] - 1s 673ms/step - loss: 147.6259 - accuracy: 1.0000 - val_loss: 202.1254 - val_accuracy: 1
Epoch 7/10
1/1 [==============================] - 1s 625ms/step - loss: 198.1669 - accuracy: 1.0000 - val_loss: 264.6966 - val_accuracy: 0
Epoch 8/10
1/1 [==============================] - 1s 696ms/step - loss: 252.2557 - accuracy: 0.2000 - val_loss: 365.6781 - val_accuracy: 0
Epoch 9/10
1/1 [==============================] - 1s 649ms/step - loss: 383.2219 - accuracy: 0.0000e+00 - val_loss: 471.2452 - val_accurac
Epoch 10/10
1/1 [==============================] - 1s 652ms/step - loss: 501.7845 - accuracy: 0.0000e+00 - val_loss: 656.0264 - val_accurac
<keras.callbacks.History at 0x7feca2016f50>
```

```
model.save("flower.h5")
```

```
import numpy as np
from tensorflow.keras.models import load_model
from tensorflow.keras.preprocessing import image
```

```
model = load_model("flower.h5")
```

```
img = image.load_img(r"/content/drive/MyDrive/NalayaThiran/images/flower1.jpeg")
```

```
img
```

```
img = image.load_img(r"/content/drive/MyDrive/NalayaThiran/images/flower4.jpeg",target_size=(100,120))
```

```
img
```

```
x = image.img_to_array(img)
```

```
x
```

```
array([[[ 67.,  75.,  62.],
        [ 86.,  92.,  90.],
        [ 83.,  92.,  89.],
        ...,
        [ 69.,  92.,  48.],
        [ 69.,  91.,  44.],
        [ 64.,  83.,  38.]],

       [[ 84.,  98.,  85.],
        [ 93., 108., 101.],
        [100., 117., 107.],
        ...,
        [ 66.,  95.,  51.],
        [ 66.,  95.,  51.],
        [ 66.,  95.,  51.]],
```

```
               [[ 73.,  88.,  81.],
                [ 67.,  87.,  78.],
                [ 51.,  79.,  57.],
                ...,
                [ 60., 102.,  52.],
                [ 58.,  98.,  48.],
                [ 50.,  87.,  44.]],

               ...,

               [[ 10.,   9.,   7.],
                [  4.,   0.,   2.],
                [  9.,  20.,  12.],
                ...,
                [  3.,   1.,   2.],
                [  3.,   1.,   2.],
                [  3.,   1.,   2.]],

               [[ 20.,  43.,  27.],
                [ 11.,  12.,  14.],
                [  8.,   8.,  10.],
                ...,
                [  3.,   1.,   2.],
                [  3.,   1.,   2.],
                [  3.,   1.,   2.]],

               [[ 30.,  76.,  50.],
                [ 19.,  52.,  35.],
                [ 23.,  22.,  20.],
                ...,
                [  2.,   0.,   1.],
                [  2.,   0.,   1.],
                [  2.,   0.,   1.]]], dtype=float32)
```

```
x = np.expand_dims(x,axis = 0)
```

Saving...

```
x
```

```
array([[[[ 67.,  75.,  62.],
```

```
 [ 86.,  92.,  90.],
 [ 83.,  92.,  89.],
 ...,
 [ 69.,  92.,  48.],
 [ 69.,  91.,  44.],
 [ 64.,  83.,  38.]],

[[ 84.,  98.,  85.],
 [ 93., 108., 101.],
 [100., 117., 107.],
 ...,
 [ 62.,  95.,  48.],
 [ 68., 100.,  51.],
 [ 66.,  95.,  51.]],

[[ 73.,  88.,  81.],
 [ 67.,  87.,  78.],
 [ 51.,  79.,  57.],
 ...,
 [ 60., 102.,  52.],
 [ 58.,  98.,  48.],
 [ 50.,  87.,  44.]],

...,

[[ 10.,   9.,   7.],
 [  4.,   0.,   2.],
 [  9.,  20.,  12.],
 ...,
 [  3.,   1.,   2.],
 [  3.,   1.,   2.],
 [  3.,   1.,   2.]],

[[ 20.,  43.,  27.],
 [ 11.,  12.,  14.],
 [  8.,   8.,  10.],
 ...,
 [  3.,   1.,   2.],
 [  3.,   1.,   2.],
 [  3.,   1.,   2.]],
```

Saving...

```
[[ 30.,  76.,  50.],
 [ 19.,  52.,  35.],
 [ 23.,  22.,  20.],
 ...,
 [  2.,   0.,   1.],
 [  2.,   0.,   1.],
 [  2.,   0.,   1.]]], dtype=float32)
```

```
/content/drive/MyDrive/NalayaThiran/images/flower3.jpeg
```

```
pred
```

```
x_test.class_indices
```

```
{'images': 0}
```

```
index = ["","images"]
```

```
img = image.load_img(r"/content/drive/MyDrive/NalayaThiran/images/flower2.jpeg",target_size=(64,64))
```

```
img
```

```
e/MyDrive/NalayaThiran/images/flower3.jpeg")
```

```
img
```

Saving...

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