ASSIGNMENT 3, NAME: MITHOON N S, ROLL NUMBER: 110819104301

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

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

```
ls
```

```
drive/  sample_data/
```

```
cd /content/drive/MyDrive/IBM-NALAIYATHIRAN/images
```

```
/content/drive/MyDrive/IBM-NALAIYATHIRAN/images
```

```
pwd
```

```
'/content/drive/MyDrive/IBM-NALAIYATHIRAN/images'
```

```
!unzip flowers.zip
```

```
Archive:  flowers.zip
  inflating: images/f1.jpg
  inflating: images/f2.jpg
  inflating: images/f3.jpg
  inflating: images/f4.jpg
  inflating: images/f5.jpg
```

Image Augmentation

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

```
train_datagen = ImageDataGenerator(rescale = 1./255,zoo
```

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

```
x_train = train_datagen.flow_from_directory(r"/content/
```

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

```
x_test = test_datagen.flow_from_directory(r"/content/dr
```

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

f1.jpg ×

```
x_train.class_indices
```

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

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


model = Sequential()


model.add(Convolution2D(32,(3,3),activation="relu",stri


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


model.add(Flatten())


model.summary()
```

```
Model: "sequential"
_________________________________________________________
 Layer (type)                Output Shape              
=========================================================
 conv2d (Conv2D)             (None, 62, 62, 32)        

 max_pooling2d (MaxPooling2D  (None, 61, 61, 32)
 )

 flatten (Flatten)           (None, 119072)            

=========================================================
Total params: 896
Trainable params: 896
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",optimiz


len(x_train)
```

```
1
```

```
model.fit(x_train,epochs = 10,steps_per_epoch=len(x_tra
```

```
Epoch 1/10
1/1 [==============================] - 2s 2s/step
```

```
Epoch 2/10
1/1 [==============================] - 1s 877ms/st
Epoch 3/10
1/1 [==============================] - 1s 671ms/st
Epoch 4/10
1/1 [==============================] - 1s 713ms/st
Epoch 5/10
1/1 [==============================] - 1s 717ms/st
Epoch 6/10
1/1 [==============================] - 1s 714ms/st
Epoch 7/10
1/1 [==============================] - 1s 792ms/st
Epoch 8/10
1/1 [==============================] - 1s 691ms/st
Epoch 9/10
1/1 [==============================] - 1s 805ms/st
Epoch 10/10
1/1 [==============================] - 1s 690ms/st
<keras.callbacks.History at 0x7f4dadb00510>
```

```
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/IBM-NALAI
```

```
img
```

```
img = image.load_img(r"/content/drive/MyDrive/IBM-NALAI
```

```
img
```

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

```
x
```

```
array([[[20., 25., 55.],
        [20., 25., 55.],
        [19., 24., 56.],
        ...,
        [17., 24., 52.],
        [18., 23., 53.],
        [17., 22., 52.]],

       [[20., 27., 56.],
        [20., 27., 56.],
        [21., 26., 56.],
        ...,
        [20., 27., 55.],
        [19., 26., 54.],
        [19., 26., 54.]],

       [[21., 27., 59.],
        [22., 28., 60.],
        [20., 27., 56.],
        ...,
        [20., 30., 57.],
        [23., 30., 58.],
        [22., 29., 57.]],

       ...,

       [[39., 72., 91.],
        [41., 74., 91.],
        [43., 76., 91.],
        ...,
        [16., 28., 52.],
        [16., 28., 54.],
        [16., 28., 54.]],

       [[39., 70., 88.],
        [41., 72., 90.],
        [41., 74., 89.],
        ...,
        [16., 28., 54.],
        [16., 28., 54.],
```

```
                [15., 27., 53.]],

               [[39., 70., 88.],
                [39., 70., 88.],
                [40., 73., 90.],
                ...,
                [17., 27., 54.],
                [17., 27., 54.],
                [17., 27., 54.]]], dtype=float32)
```

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

```
x
```

```
     array([[[[20., 25., 55.],
              [20., 25., 55.],
              [19., 24., 56.],
              ...,
              [17., 24., 52.],
              [18., 23., 53.],
              [17., 22., 52.]],

             [[20., 27., 56.],
              [20., 27., 56.],
              [21., 26., 56.],
              ...,
              [20., 27., 55.],
              [19., 26., 54.],
              [19., 26., 54.]],

             [[21., 27., 59.],
              [22., 28., 60.],
              [20., 27., 56.],
              ...,
              [20., 30., 57.],
              [23., 30., 58.],
              [22., 29., 57.]],

             ...,

             [[39., 72., 91.],
              [41., 74., 91.],
              [43., 76., 91.],
              ...,
              [16., 28., 52.],
              [16., 28., 54.],
              [16., 28., 54.]],

             [[39., 70., 88.],
              [41., 72., 90.],
              [41., 74., 89.],
              ...,
              [16., 28., 54.],
              [16., 28., 54.],
              [15., 27., 53.]],

             [[39., 70., 88.],
              [39., 70., 88.],
```

```
                [40., 73., 90.],
                ...,
                [17., 27., 54.],
                [17., 27., 54.],
                [17., 27., 54.]]]], dtype=float32)
```

```
pred = model.predict(x)
```

```
1/1 [==============================] - 0s 126ms/st
```

```
pred
```

```
array([[0., 0., 0., 0., 1.]], dtype=float32)
```

```
x_test.class_indices
```

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

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

```
img = image.load_img(r"/content/drive/MyDrive/IBM-NALAI
```

```
img
```

```
img = image.load_img(r"/content/drive/MyDrive/IBM-NALAI
```

```
img
```

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