

**Assignment -3**  
Python Programming

Assignment Date	6 OCTOBER 2022
Student Name	Raagavi M
Student Roll Number	820419106044
Maximum Marks	2 Marks

- Download the Dataset
- Image Augmentation
- Create Model
- Add Layers (Convolution,MaxPooling,Flatten,Dense-(Hidden Layers),Output)
- Compile The Model
- Fit The Model
- Save The Model
- Test The Model

In [1]:

```
ls
```

sample\_data/

In [2]:

```
cd /content/drive/MyDrive/Dataset
```

/content/drive/MyDrive/Dataset

In [3]:

```
ls
```

Churn\_Modelling.csv Flowers-Dataset.zip

In [4]:

```
!unzip Flowers-Dataset.zip
```

Archive: Flowers-Dataset.zip

```
inflating: flowers/daisy/100080576_f52e8ee070_n.jpg
inflating: flowers/daisy/10140303196_b88d3d6cec.jpg
inflating: flowers/daisy/10172379554_b296050f82_n.jpg
inflating: flowers/daisy/10172567486_2748826a8b.jpg
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```

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inflating: flowers/daisy/20289938802\_e16fa9f23d.jpg  
inflating: flowers/daisy/20329326505\_a777c71cc2.jpg

```
inflating: flowers/tulip/8768645961_8f1e097170_n.jpg
inflating: flowers/tulip/8817622133_a42bb90e38_n.jpg
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inflating: flowers/tulip/8908062479_449200a1b4.jpg
inflating: flowers/tulip/8908097235_c3e746d36e_n.jpg
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inflating: flowers/tulip/9947385346_3a8cacea02_n.jpg
inflating: flowers/tulip/9976515506_d496c5e72c.jpg
```

In [50]:

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

In [51]:

```
train_datagen = ImageDataGenerator(rescale=1./255, horizontal_flip = True, vertical_flip=True, zoom_range=0.2)
```

In [52]:

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

In [53]:

```
x_train=train_datagen.flow_from_directory(r"/content/drive/MyDrive/Dataset/flowers", target_size=(64, 64), class_mode="categorical", batch_size=24)
```

Found 4317 images belonging to 5 classes.

In [54]:

```
x_test=test_datagen.flow_from_directory(r"/content/drive/MyDrive/Dataset/flowers", target_size=(64, 64), class_mode="categorical", batch_size=24)
```

Found 4317 images belonging to 5 classes.

In [44]:

```
#model
```

In [55]:

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

In [56]:

```
model=Sequential()
```

In [72]:

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

In [74]:

```
model.add(MaxPooling2D(pool_size=(2, 2)))
```



```
model.add(MaxPooling2D(pool_size=(2,2)))
```

In [75]:

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

In [76]:

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

In [77]:

```
model.add(Dense(5,activation='softmax'))
```

In [78]:

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

In [79]:

```
len(x_train)
```

Out[79]:

180

In [80]:

```
model.fit(x_train,epochs=5,validation_data=x_test,steps_per_epoch=len(x_train),validation_steps=len(x_test))
```

Epoch 1/5

180/180 [=====] - 127s 701ms/step - loss: 1.2830 - accuracy: 0.4656 - val\_loss: 1.0815 - val\_accuracy: 0.5617

Epoch 2/5

180/180 [=====] - 128s 710ms/step - loss: 1.0532 - accuracy: 0.5905 - val\_loss: 0.9313 - val\_accuracy: 0.6500

Epoch 3/5

180/180 [=====] - 127s 707ms/step - loss: 0.9782 - accuracy: 0.6173 - val\_loss: 0.8848 - val\_accuracy: 0.6498

Epoch 4/5

180/180 [=====] - 126s 698ms/step - loss: 0.8780 - accuracy: 0.6625 - val\_loss: 0.7988 - val\_accuracy: 0.6924

Epoch 5/5

180/180 [=====] - 125s 694ms/step - loss: 0.8391 - accuracy: 0.6757 - val\_loss: 0.7901 - val\_accuracy: 0.6908

Out[80]:

<keras.callbacks.History at 0x7f93968e53d0>

In [81]:

```
model.save('flowers.h5')
```

In [82]:

```
#testing of the model
```

In [83]:

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

In [84]:

```
model=load_model("/content/drive/MyDrive/Dataset/flowers.h5")
```

In [88]:

```
img=image.load_img("/content/drive/MyDrive/Dataset/flowers/daisy/10140303196_b88d3d6cec.i
```

```
pg",target_size=(64,64))
```

In [89]:



Out[89]:



```
In [90]:
```

```
x=image.img_to_array
```

```
In [91]:
```

X

Out[91]:

```
<function keras.preprocessing.image.img_to_array(img, data_format=None, dtype=None)>
```

