Assignment -3
Python Programming

Assignment Date	06 October 2022
Student Name	Hemapriya R
Student Roll Number	820419106019
Maximum Marks	2 Marks

Tasks:

1.Download the dataset

2.Image Augmentation

3.Create Model

4.Add Layers(Convolution,Maxpooling,Flatten,Dense-(Hidden Layers),Output)

5.Compile the model

6.Fit the model

7.Save the model

8.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
  inflating: flowers/daisy/10172636503_21bededa75_n.jpg
  inflating: flowers/daisy/102841525_bd6628ae3c.jpg
  inflating: flowers/daisy/10300722094_28fa978807_n.jpg
  inflating: flowers/daisy/1031799732_e7f4008c03.jpg
  inflating: flowers/daisy/10391248763_1d16681106_n.jpg
  inflating: flowers/daisy/10437754174_22ec990b77_m.jpg
  inflating: flowers/daisy/10437770546_8bb6f7bdd3_m.jpg
  inflating: flowers/daisy/10437929963_bc13eebe0c.jpg
  inflating: flowers/daisy/10466290366_cc72e33532.jpg
  inflating: flowers/daisy/10466558316_a7198b87e2.jpg
  inflating: flowers/daisy/10555749515_13a12a026e.jpg
  inflating: flowers/daisy/10555815624_dc211569b0.jpg
  inflating: flowers/daisy/10555826524_423eb8bf71_n.jpg
  inflating: flowers/daisy/10559679065_50d2b16f6d.jpg
  inflating: flowers/daisy/105806915_a9c13e2106_n.jpg
  inflating: flowers/daisy/10712722853_5632165b04.jpg
  inflating: flowers/daisy/107592979_aaa9cdfe78_m.jpg
  inflating: flowers/daisy/10770585085_4742b9dac3_n.jpg
  inflating: flowers/daisy/10841136265_af473efc60.jpg
  inflating: flowers/daisy/10993710036_2033222c91.jpg
  inflating: flowers/daisy/10993818044_4c19b86c82.jpg
  inflating: flowers/daisy/10994032453_ac7f8d9e2e.jpg
  inflating: flowers/daisy/11023214096_b5b39fab08.jpg
  inflating: flowers/daisy/11023272144_fce94401f2_m.jpg
  inflating: flowers/daisy/11023277956_8980d53169_m.jpg
  inflating: flowers/daisy/11124324295_503f3a0804.jpg
  inflating: flowers/daisy/1140299375_3aa7024466.jpg
  inflating: flowers/daisy/11439894966_dca877f0cd.jpg
  inflating: flowers/daisy/1150395827_6f94a5c6e4_n.jpg
  inflating: flowers/daisy/11642632_1e7627a2cc.jpg
  inflating: flowers/daisy/11834945233_a53b7a92ac_m.jpg
  inflating: flowers/daisy/11870378973_2ec1919f12.jpg
  inflating: flowers/daisy/11891885265_ccefec7284_n.jpg
  inflating: flowers/daisy/12193032636_b50ae7db35_n.jpg
  inflating: flowers/daisy/12348343085_d4c396e5b5_m.jpg
  inflating: flowers/daisy/12585131704_0f64b17059_m.jpg
  inflating: flowers/daisy/12601254324_3cb62c254a_m.jpg
  inflating: flowers/daisy/1265350143_6e2b276ec9.jpg
  inflating: flowers/daisy/12701063955_4840594ea6_n.jpg
  inflating: flowers/daisy/1285423653_18926dc2c8_n.jpg
  inflating: flowers/daisy/1286274236_1d7ac84efb_n.jpg
  inflating: flowers/daisy/12891819633_e4c82b51e8.jpg
```

```
  inflating: flowers/tulip/8768645961_8f1e097170_n.jpg
  inflating: flowers/tulip/8817622133_a42bb90e38_n.jpg
  inflating: flowers/tulip/8838347159_746d14e6c1_m.jpg
  inflating: flowers/tulip/8838354855_c474fc66a3_m.jpg
  inflating: flowers/tulip/8838914676_8ef4db7f50_n.jpg
  inflating: flowers/tulip/8838975946_f54194894e_m.jpg
  inflating: flowers/tulip/8838983024_5c1a767878_n.jpg
  inflating: flowers/tulip/8892851067_79242a7362_n.jpg
  inflating: flowers/tulip/8904780994_8867d64155_n.jpg
  inflating: flowers/tulip/8908062479_449200a1b4.jpg
  inflating: flowers/tulip/8908097235_c3e746d36e_n.jpg
  inflating: flowers/tulip/9019694597_2d3bbedb17.jpg
  inflating: flowers/tulip/9030467406_05e93ff171_n.jpg
  inflating: flowers/tulip/9048307967_40a164a459_m.jpg
  inflating: flowers/tulip/924782410_94ed7913ca_m.jpg
  inflating: flowers/tulip/9378657435_89fabf13c9_n.jpg
  inflating: flowers/tulip/9444202147_405290415b_n.jpg
  inflating: flowers/tulip/9446982168_06c4d71da3_n.jpg
  inflating: flowers/tulip/9831362123_5aac525a99_n.jpg
  inflating: flowers/tulip/9870557734_88eb3b9e3b_n.jpg
  inflating: flowers/tulip/9947374414_fdf1d0861c_n.jpg
  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=Tr
ue,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",targe
t_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)))
```

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),validatio
n_steps=len(x_test))
```

```
Epoch 1/5
180/180 [==============================] - 127s 701ms/step - loss: 1.2830 - accuracy: 0.4
656 - val_loss: 1.0815 - val_accuracy: 0.5617
Epoch 2/5
180/180 [==============================] - 128s 710ms/step - loss: 1.0532 - accuracy: 0.5
905 - val_loss: 0.9313 - val_accuracy: 0.6500
Epoch 3/5
180/180 [==============================] - 127s 707ms/step - loss: 0.9782 - accuracy: 0.6
173 - val_loss: 0.8848 - val_accuracy: 0.6498
Epoch 4/5
180/180 [==============================] - 126s 698ms/step - loss: 0.8780 - accuracy: 0.6
625 - val_loss: 0.7988 - val_accuracy: 0.6924
Epoch 5/5
180/180 [==============================] - 125s 694ms/step - loss: 0.8391 - accuracy: 0.6
757 - 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.j
```

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

In [89]:

```
img
```

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)>
```