ASSIGNMENT – 3
Python Programming

College Name	Karpagam College of Engineering
Student Name	Mr . Vishwa M
Student Roll Number	19L258

1.DOWNLOAD THE DATA SET

Solution :

```
!unzip '/content/drive/MyDrive/Flowers-Dataset.zip'
```

Output:

```
Archive:  /content/drive/MyDrive/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
```

2.IMAGE AUGMENTATION

Solution :

```
from tensorflow.keras.preprocessing.image import ImageDataGenerator
train_datagen=ImageDataGenerator(rescale=1./255,
                                 zoom_range=0.2,
                                 horizontal_flip=True)
test_datagen=ImageDataGenerator(rescale=1./255)
xtrain=train_datagen.flow_from_directory('/content/flowers',
                                         target_size=(76,76),
                                         class_mode='categorical',
                                         batch_size=100)
xtest=test_datagen.flow_from_directory('/content/flowers',
                                         target_size=(76,76),
                                         class_mode='categorical',
                                         batch_size=100)
```

3.CREAT MODEL

Solution:

```
from tensorflow.keras.models import Sequential
from tensorflow.keras.layers import Convolution2D,MaxPool2D,Flatten,Dense
```

4.ADD LAYERS

Solution:

```
model=Sequential()
model.add(Convolution2D(32,(3,3),activation='relu',input_shape=(76,76,3)))
model.add(MaxPool2D(pool_size=(2,2)))
model.add(Flatten())
model.add(Dense(300,activation='relu'))
model.add(Dense(150,activation='relu'))
model.add(Dense(4,activation='softmax'))
```

5.COMPILE THE MODEL

Solution:

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

6.FIT THE MODEL

Solution:

```
model.fit_generator(xtrain,
                    steps_per_epoch= len (xtrain),
                    epochs= 10,
                    validation_data=xtest,
                    validation_steps= len (xtest))
```

7 : SAVE THE MODEL

Solution :

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

8.TESTING THE MODEL

testing 1

Solution:

```
from tensorflow.keras.preprocessing import image
import numpy as np
img=image.load_img('/content/flowers/daisy/10140303196_b88d3d6cec.jpg',target_s
ize=(76,76))
img
```

Output:

Solution:

```
x=image.img_to_array(img)
x
x=np.expand_dims(x,axis=0)
pred=np.argmax(model.predict(x))
pred
op=['daisy','dandelion','rose','sunflower','tulip']
op[pred]
```

Output:

```
'daisy'
```

testing 2

Solution:

```
img
img=image.load_img('/content/flowers/rose/10503217854_e66a804309.jpg',target_si
ze=(76,76))
```

Output:

Solution:

```
x=image.img_to_array(img)
x
x=np.expand_dims(x,axis=0)
pred=np.argmax(model.predict(x))
pred
op=['daisy','dandelion','rose','sunflower','tulip']
op[pred]
```

Output:

```
'daisy'
```

testing 3

Solution:

```
img=image.load_img('/content/flowers/sunflower/1022552002_2b93faf9e7_n.jpg',tar
get_size=(76,76))
img
```

Output:

Solution:

```
x=image.img_to_array(img)
x
x=np.expand_dims(x,axis=0)
pred=np.argmax(model.predict(x))
pred
op=['daisy','dandelion','rose','sunflower','tulip']
op[pred]
```

Output:

```
'daisy'
```