Assignment -3

Python Programming

Assignment Date	06-10 2022
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Student Roll Number	820419106067
Maximum Marks	2 Marks

In [ ]:

```
ls
```

```
sample_data/
```

In [ ]:

```
cd/content/drive/MyDrive/ACNN
```

```
/content/drive/MyDrive/ACNN
```

In [ ]:

```
ls
```

```
flowers/  Flowers-Dataset.zip  Untitled0.ipynb
```

In [ ]:

```
pwd
```

Out[4]:

```
'/content/drive/MyDrive/ACNN'
```

In [7]:

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

```
  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/daisy/1299501272_59d9da5510_n.jpg
  inflating: flowers/daisy/1306119996_ab8ae14d72_n.jpg
  inflating: flowers/daisy/1314069875_da8dc023c6_m.jpg
  inflating: flowers/daisy/1342002397_9503c97b49.jpg
  inflating: flowers/daisy/134409839_71069a95d1_m.jpg
  inflating: flowers/daisy/1344985627_c3115e2d71_n.jpg
  inflating: flowers/daisy/13491959645_2cd9df44d6_n.jpg
```

In [8]:

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

In [9]:

```
train_datagen = ImageDataGenerator(rescale= 1./255,horizontal_flip = True,vertical_flip = T
```

In [10]:

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

In [11]:

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

```
Found 4317 images belonging to 5 classes.
```

In [12]:

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

```
Found 4317 images belonging to 5 classes.
```

In [ ]:

```
#model
```

In [13]:

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

In [14]:

```
model = Sequential()
```

In [15]:

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

In [16]:

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

In [17]:

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

In [18]:

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

In [19]:

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

In [20]:

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

In [21]:

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

In [22]:

```
len(x_train)
```

Out[22]:

```
180
```

In [25]:

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

```
Epoch 1/5
180/180 [==============================] - 68s 378ms/step - loss: 0.9906 - a
ccuracy: 0.6085 - val_loss: 0.9523 - val_accuracy: 0.6396
Epoch 2/5
180/180 [==============================] - 69s 382ms/step - loss: 0.9248 - a
ccuracy: 0.6386 - val_loss: 0.9120 - val_accuracy: 0.6574
Epoch 3/5
180/180 [==============================] - 68s 378ms/step - loss: 0.8777 - a
ccuracy: 0.6637 - val_loss: 0.8271 - val_accuracy: 0.6759
Epoch 4/5
180/180 [==============================] - 69s 386ms/step - loss: 0.8483 - a
ccuracy: 0.6722 - val_loss: 0.8134 - val_accuracy: 0.6864
Epoch 5/5
180/180 [==============================] - 68s 380ms/step - loss: 0.8059 - a
ccuracy: 0.6921 - val_loss: 0.7686 - val_accuracy: 0.7116
```

Out[25]:

```
<keras.callbacks.History at 0x7f68afc30050>
```

In [26]:

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

In [ ]:

```
#testing of the model
```

In [27]:

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

In [28]:

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

In [31]:

```
img=image.load_img("/content/drive/MyDrive/ACNN/flowers/rose/174109630_3c544b8a2f.jpg",targ
```

In [32]:

```
img
```

Out[32]:

In [33]:

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

In [34]:

```
x
```

Out[34]:

```
array([[[ 38.,  38.,  64.],
        [ 44.,  47.,  28.],
        [ 81.,  72.,  93.],
        ...,
        [ 19.,  24.,  30.],
        [ 19.,  24.,  30.],
        [ 18.,  21.,  28.]],

       [[ 31.,  34.,  39.],
        [178., 165., 174.],
        [198., 192., 192.],
        ...,
        [ 17.,  22.,  28.],
        [ 20.,  25.,  31.],
        [ 17.,  20.,  27.]],

       [[205., 204., 209.],
        [222., 212., 210.],
        [199., 187., 187.],
        ...,
        [ 21.,  26.,  32.],
        [ 15.,  20.,  26.],
        [ 18.,  21.,  26.]],

       ...,

       [[233., 234., 229.],
        [235., 236., 231.],
        [238., 239., 234.],
        ...,
        [121., 113., 102.],
        [165., 165., 155.],
        [148., 162., 139.]],

       [[234., 235., 230.],
        [235., 236., 231.],
        [237., 238., 233.],
        ...,
        [187., 193., 179.],
        [153., 156., 139.],
        [118., 144., 157.]],

       [[228., 229., 223.],
        [231., 232., 226.],
        [232., 233., 228.],
        ...,
        [198., 198., 188.],
        [125., 127., 114.],
        [117., 134., 126.]]], dtype=float32)
```

In [35]:

```
x.ndim
```

Out[35]:

```
3
```

In [36]:

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

In [37]:

```
x.ndim
```

Out[37]:

```
4
```

In [39]:

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

In [40]:

```
pred
```

Out[40]:

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

In [41]:

```
labels = ["daisy","dandelion","rose","sunflower","tulip"]
```

In [42]:

```
np.argmax(pred)
```

Out[42]:

```
2
```

In [43]:

```
labels[np.argmax(pred)]
```

Out[43]:

```
'rose'
```

In [ ]:

```

```