Assignment -3

Problem Statement :- Build CNN Model for Classification Of Flowers

Assignment Date	09 October 2022
Student Name	S.UMESH
Student Roll Number	923119106010
Maximum Marks	2 Marks

1.Download the dataset

Dataset is downloaded from the question paper

In [7]:

```
from google.colab import drive
drive.mount('/content/drive')
Drive already mounted at /content/drive; to attempt to forcibly remount, ca
ll drive.mount("/content/drive", force_remount=True).
```

Unzip the data

In [8]:

```
# Extract data

!unzip '/content/drive/MyDrive/Flowers-Dataset.zip'
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
  inflating: flowers/daisy/11023272144_fce94401f2_m.jpg
```

2.Image augmentation

In [9]:

```
# Import necessary lib.

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

In [10]:

```
# Data Augmentation on training variable

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

In [12]:

```
# Data Augmentation on flowers data

xtrain = train_datagen.flow_from_directory('/content/flowers',
                                           target_size=(64,64),
                                           class_mode='categorical',
                                           batch_size=100)
Found 4317 images belonging to 5 classes.
```

3.Create model

In [13]:

```
# Importing reg lib

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

4.Build the model

In [14]:

```
# Build a CNN block

model = Sequential() # Initializing sequential model
model.add(Convolution2D(32,(3,3),activation='relu',input_shape=(64,64,3)))
# convolution layer
model.add(MaxPooling2D(pool_size=(2, 2))) # Max pooling layer
model.add(Flatten()) # Flatten layer
model.add(Dense(300,activation='relu')) # Hidden layer 1
model.add(Dense(150,activation='relu')) # Hidden layer 2
model.add(Dense(4,activation='softmax')) # Output layer
```

5.Compile the model

In [69]:

```
# Compiling the model

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

6.Fit the model

> Here we have only one folder of flowers, we did not have separate folder like train nand test so we could not fit here

7.Save model

In [16]:

```
# Save model

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

8.Testing model

In [49]:

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

In [50]:

```
# Testing the model

img =
image.load_img('/content/flowers/dandelion/8083321316_f62ea76f72_n.jpg',tar
get_size=(64,64)) # Reading image
x = image.img_to_array(img)
x = np.expand_dims(x,axis=0)
pred = np.argmax(model.predict(x))
op = ['daisy','dandelion','rose','sunflower','tulip']
op[pred]
```

Out[50]:

```
'dandelion'
```

In [58]:

```
img =
image.load_img('/content/flowers/tulip/5543457754_89c44c88de_n.jpg',target_
size=(64,64)) # Reading image
x = image.img_to_array(img)
x = np.expand_dims(x,axis=0)
pred = np.argmax(model.predict(x))
op = ['daisy','dandelion','rose','sunflower','tulip']
op[pred]
```

Out[58]:

```
'dandelion'
```

In [65]:

```
xtrain.class_indices
```

Out[65]:

```
{'daisy': 0, 'dandelion': 1, 'rose': 2, 'sunflower': 3, 'tulip': 4}
```