## Assignment -3 Build CNN Model for Classification Of Flowers

Assignment submission	10 October 2022
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Maximum Marks	2 Marks

## 1. Download the dataset: Dataset

```
>from google.colab import drive
>drive.mount('/content/drive')

Mounted at /content/drive

>cd /content/drive/MyDrive

/content/drive/MyDrive

>!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/101725636503_21bededa75_n.jpg
   inflating: flowers/daisy/102841525_bd6628ae3c.jpg
```

## 2. Image Augmentation

```
from tensorflow.keras.preprocessing.image import ImageDataGenerator
train_datagen=ImageDataGenerator(rescale=1./255,zoom_range=0.2,horizontal_fli
p=True,vertical_flip=False)
```

test datagen=ImageDataGenerator(rescale=1./255)

## 3. Create Model

```
>X_train=train_datagen.flow_from_directory('/content/drive/MyDrive/Flowers-Dataset/flowers', target_size=(64,64), class_mode='categorical', batch_size=24)
Found 30 images belonging to 5 classes.

>X_test=train_datagen.flow_from_directory('/content/drive/MyDrive/Flowers-Dataset/flowers', target_size=(64,64), class_mode='categorical', batch_size=24)
Found 40 images belonging to 5 classes.
```

```
>X train.class indices
{'daisy': 0, 'dandelion': 1, 'rose': 2, 'sunflower': 3, 'tulip': 4}
4. Add Layers (Convolution, MaxPooling, Flatten, Dense-(Hidden Layers), Output)
from tensorflow.keras.models import Sequential
from tensorflow.keras.layers import Dense, Convolution2D, MaxPooling2D, Flatten
model=Sequential()
model.add(Convolution2D(32,(3,3),input shape=(64,64,3),activation='relu'))
model.add(MaxPooling2D(pool size=(2,2)))
model.add(Flatten())
model.summary()
Model: "sequential 1"
Layer (type)
                          Output Shape
                                                   Param #
______
 conv2d (Conv2D)
                           (None, 62, 62, 32)
                                                    896
max pooling2d (MaxPooling2D (None, 31, 31, 32)
                                                    0
 )
 flatten (Flatten)
                            (None, 30752)
                                                    0
______
Total params: 896
Trainable params: 896
Non-trainable params: 0
model.add(Dense(300,activation='relu'))
model.add(Dense(150,activation='relu'))
model.add(Dense(4,activation='softmax'))
5. Compile The Model
     model.compile(loss='categorical crossentropy',optimizer='adam',metrics=
['accuracy'])
6. Fit The Model
model.fit generator(X train, steps per epoch=len(X train), validation data=X te
st,validation_steps=len(X_test),epochs=10)
7. Save The Model
model.save('flowersss.h5')
8. Test The Model
```

import numpy as np

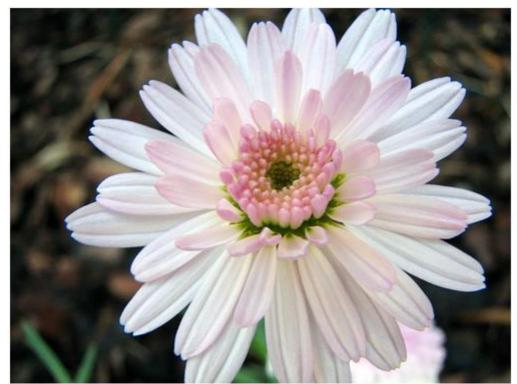
from tensorflow.keras.models import load\_model
from tensorflow.keras.preprocessing import image

model=load\_model('/content/drive/MyDrive/flowersss')

img=image.load\_img("/content/drive/MyDrive/flowers/daisy/153210866\_03cc9f2f36
.jpg" )

img

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>img=image.load\_img("/content/drive/MyDrive/flowers/daisy/153210866\_03cc9f2f3
6.jpg",target\_size=(64,64) )
img





```
>X=image.img_to_array(img)
>X
array([[[13., 20., 13.], [14., 23., 18.], [20., 27., 20.], ..., [50., 41.,
32.], [46., 37., 28.], [17., 19., 14.]], [[18., 20., 15.], [25., 31., 29.],
[29., 31., 28.], ..., [46., 48., 34.], [50., 41., 32.], [ 3., 5., 4.]],
[[14., 20., 16.], [17., 22., 16.], [18., 20., 17.], ..., [52., 50., 38.],
[50., 47., 38.], [21., 23., 20.]], ..., [[21., 26., 20.], [40., 40., 32.],
[34., 35., 30.], ..., [21., 28., 21.], [11., 15., 14.], [22., 21., 17.]],
[[26., 31., 27.], [53., 53., 43.], [32., 37., 31.], ..., [28., 34., 24.],
[21., 31., 22.], [50., 50., 38.]], [[34., 36., 31.], [43., 46., 35.], [24.,
```

```
26., 21.], ..., [71., 65., 49.], [69., 63., 47.], [83., 76., 60.]]],
dtype=float32)

>y=np.argmax(model.predict(X),axis=1)
>y

array([0])

>X_train.class_indices
{'daisy': 0, 'dandelion': 1, 'rose': 2, 'sunflower': 3, 'tulip': 4}

>index=['daisy', 'dandelion','rose', 'sunflower','tulip']
>index[y[0]]

'daisy'
```