

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

Assignment submission	11 October 2022
Student Name	M Narkess Banu
Student Roll Number	951919CS062
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/10172636503_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_flip=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='cate  
gorical',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,Convolutio  
n2D,MaxPooling2D,Flatten  
model=Sequential()  
model.add(Convolution2D(32,(3,3),input_shape=(64,6  
4,3),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_test,validation_steps=len(X_test),epochs=10)
```

## 7. Save The Model

```
model.save('flowerssss.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/flowerssss'
)
```

```
img=image.load_img("/content/drive/MyDrive/flowers/daisy/153210866_03cc9f2f36.jpg" )
img
```



```
>img=image.load_img("/content/drive/MyDrive/flowers/daisy/153210866_03cc9f2f36.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'
```