

# Assignment 3

- Download the Dataset :  
<https://drive.google.com/file/d/1xkynpL15pt6KT3YSIDimu4A5iRU9qYck/view>
- Image Augmentation
- Create Model
- Add Layers (Convolution,MaxPooling,Flatten,Dense-(Hidden Layers),Output)
- Compile The Model
- Fit The Model
- Save The Model
- Test The Model

## ▼ Importing Packages

```
from tensorflow.keras.models import Sequential
from tensorflow.keras.layers import Convolution2D,MaxPooling2D,Flatten,Dense
from tensorflow.keras.preprocessing.image import ImageDataGenerator as idm
import numpy as np
import warnings
#Supressing warnings
warnings.filterwarnings('ignore')
```

## ▼ 2.Image Augmentation

```
# Creating augmentation on training variable
train_flowers=idm(rescale=1./255, zoom_range=0.2, horizontal_flip=True)

# Passing training data to train variable
Xtrain = train_flowers.flow_from_directory('/content/drive/MyDrive/IBM/Flowers-Dataset', ta
```

```
-----
FileNotFoundError                                Traceback (most recent call last)
<ipython-input-3-ef61f13bf170> in <module>
```

```
3
4 # Passing training data to train variable
----> 5 Xtrain =
train_flowers.flow_from_directory('/content/drive/MyDrive/IBM/Flowers-
Dataset',target_size=(76,76),class_mode='categorical',batch_size=100)
```

```
# Creating augmentation on testing variable
test_flowers=idm(rescale=1./255)
```

```
# Passing testing data to test variable
Xtest = test_flowers.flow_from_directory('/content/drive/MyDrive/IBM/Flower_Training',target_size=(76,76),class_mode='categorical',batch_size=100)
```

```
Found 204 images belonging to 5 classes.
```

```
--> 50/100 [ 20s] 200 samples in sorted(os.listdir(directory)):
```

### ▼ 3. Create Model

```
'/content/drive/MyDrive/IBM/Flowers-Dataset'
```

```
Flower_model = Sequential()
Flower_model.add(Convolution2D(32,(3,3),activation='relu',input_shape=(76,76,3)))
Flower_model.add(MaxPooling2D(pool_size=(2,2)))
Flower_model.add(Flatten())
Flower_model.add(Dense(300,activation='relu'))
Flower_model.add(Dense(150,activation='relu'))
Flower_model.add(Dense(5,activation='softmax'))
```

### ▼ 4. Compile the Model

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

### ▼ 5. Fit the Model

```
Flower_model.fit_generator(Xtrain,steps_per_epoch= len (Xtrain),epochs= 10,validation_data=(Xtest,Xtest_targets))
```

```
Epoch 1/10
42/42 [=====] - 567s 14s/step - loss: 1.9592 - accuracy: 0.00
Epoch 2/10
42/42 [=====] - 26s 618ms/step - loss: 1.1221 - accuracy: 0.00
Epoch 3/10
42/42 [=====] - 26s 612ms/step - loss: 1.0173 - accuracy: 0.00
Epoch 4/10
42/42 [=====] - 26s 611ms/step - loss: 0.9552 - accuracy: 0.00
Epoch 5/10
42/42 [=====] - 26s 620ms/step - loss: 0.8832 - accuracy: 0.00
Epoch 6/10
42/42 [=====] - 26s 621ms/step - loss: 0.8373 - accuracy: 0.00
```

```

Epoch 7/10
42/42 [=====] - 26s 615ms/step - loss: 0.8125 - accuracy: 0
Epoch 8/10
42/42 [=====] - 26s 608ms/step - loss: 0.7663 - accuracy: 0
Epoch 9/10
42/42 [=====] - 26s 616ms/step - loss: 0.7333 - accuracy: 0
Epoch 10/10
42/42 [=====] - 26s 613ms/step - loss: 0.7128 - accuracy: 0
<keras.callbacks.History at 0x7fd5aec82f50>

```

## ▼ 7. Save the model

```
Flower_model.save('Flower.h5')
```

## ▼ 8. Test the model

```
test_img=image.load_img('/content/drive/MyDrive/IBM/Flowers-Dataset/sunflower/200557977_bf
test_img
```



```

x=image.img_to_array(test_img)
x=np.expand_dims(x,axis=0)
predicted=np.argmax(Flower_model.predict(x))
Prediction_category=['daisy','dandelion','rose','sunflower','tulip']
Prediction_category[predicted]

'sunflower'

```

```
test_img1=image.load_img('/content/drive/MyDrive/IBM/Flowers-Dataset/daisy/1140299375_3aa7
test_img1
```



```

x=image.img_to_array(test_img1)
x=np.expand_dims(x,axis=0)
predicted=np.argmax(Flower_model.predict(x))
Prediction_category[predicted]

'daisy'

```

```
test_img2=image.load_img('/content/drive/MyDrive/IBM/Flowers-Dataset/rose/7251352826_69b62  
test_img2
```



```
x=image.img_to_array(test_img2)  
x=np.expand_dims(x,axis=0)  
predicted=np.argmax(Flower_model.predict(x))  
Prediction_category[predicted]
```

'rose'

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