Assignment -3

Python Programming

Assignment Date	7 September 2022
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Student Roll Number	412519104030
Maximum Marks	2 Marks

Question-1:

Download dataset

Solution:

```
from google.colab import drive

drive.mount('/content/drive')

cd/content/drive/MyDrive/AI_IBM

!unzip Flowers-Dataset.zip
```

Question-2:

Image Augmentation

Solution:

```
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)

x_train=train_datagen.flow_from_directory(r"/content/drive/MyDrive/AI_IBM/flowers",target_size=(64,64),class_mode='categorical',batch_size=24)

x_train.class_indices
```

```
[ ] 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)

[ ] x_train=train_datagen.flow_from_directory(r"/content/drive/MyDrive/AI_IBM/flowers",target_size=(64,64),class_mode='categorical',batch_size=24)
    Found 4317 images belonging to 5 classes.

[ ] x_test=test_datagen.flow_from_directory(r"/content/drive/MyDrive/AI_IBM/flowers",target_size=(64,64),class_mode='categorical',batch_size=24)
    Found 4317 images belonging to 5 classes.

[ ] x_train.class_indices
    {'daisy': 0, 'dandelion': 1, 'rose': 2, 'sunflower': 3, 'tulip': 4}
```

Question 3

Create Model

Solution:

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

```
Step -3 Initializing CNN And Create Model

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

Question 4

Add Layers

Solution:

model=Sequential()

4.1 Input Layers (Convolution ,MaxPooling,Flatten)

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()

```
Step -4 Add layers

[ ] model=Sequential()

4.1 Input Layers (Convolution ,MaxPooling,Flatten)

[ ] 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"
    _________________________________________________________________
     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
    _________________________________________________________________
```

4.2 Hidden Layers

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

model.add(Dense(150,activation='relu'))

Step -7 Test The model

```
ls
```

```
flowers/  Flowers_classification_model1.h5  Flowers-Dataset.zip
```

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

```
# Load the model
model=load_model('Flowers_classification_model1.h5')
```

```
img=image.load_img(r"/content/drive/MyDrive/AI_IBM/flowers/s3.jpg",target_size=(64,64))
x=image.img_to_array(img)
x=np.expand_dims(x,axis=0)
y=np.argmax(model.predict(x),axis=1)
# x_train.class_indices
index=['daisy','dandelion','rose','sunflower','tulip']
index[y[0]]
```

```
'daisy'
```

** percent of accuracy with this model** **Team ID : PNT2022TMID03893**

4.3 Output Layers

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

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

len(x_train)

4.3 Output Layers

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

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

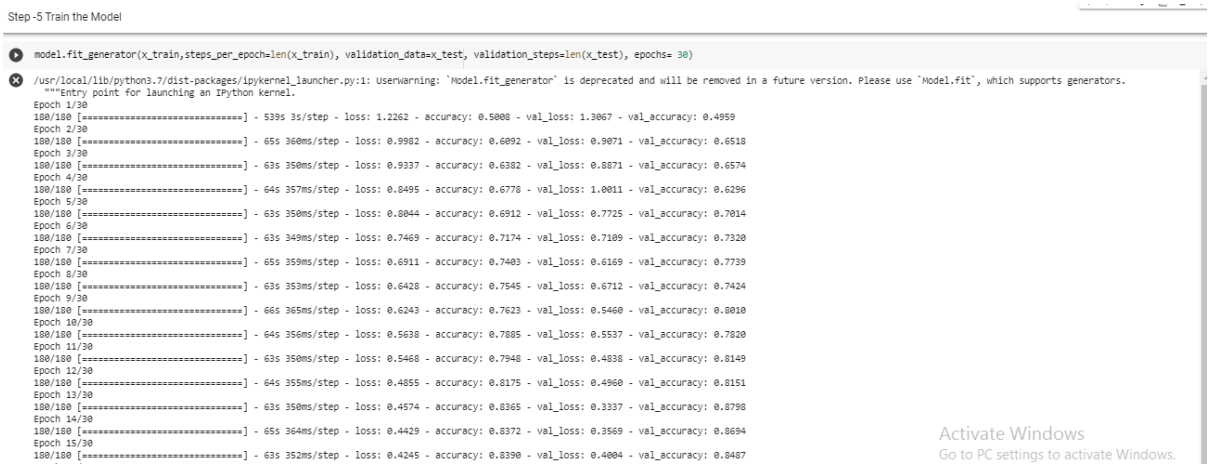
```
len(x_train)
```

```
180
```

Question 5

Train the Model

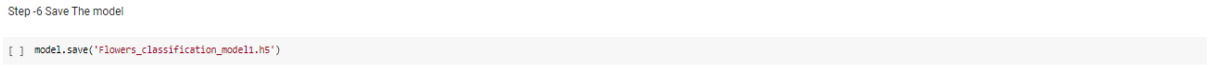
model.fit_generator(x_train,steps_per_epoch=len(x_train), validation_data=x_test,
validation_steps=len(x_test), epochs= 30)



Question 6

Save The model

```
model.save('Flowers_classification_model1.h5')
```



Question 7

Test The model

```
ls
imnumpy as np
from tensorflow.keras.models import load_model
from tensorflow.keras.preprocessing import imageport
model=load_model('Flowers_classification_model1.h5')
img=image.load_img(r"/content/drive/MyDrive/AI_IBM/flowers/s3.jpg",target_size=(64
,64))
x=image.img_to_array(img)
x=np.expand_dims(x,axis=0)
y=np.argmax(model.predict(x),axis=1)
index=['daisy','dandelion','rose','sunflower','tulip']
index[y[0]]
```

Step -7 Test The model

```
ls
```

```
flowers/  Flowers_classification_model1.h5  Flowers-Dataset.zip
```

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

```
[ ] # Load the model
    model=load_model('Flowers_classification_model1.h5')
```

```
[ ] img=image.load_img(r"/content/drive/MyDrive/AI_IBM/flowers/s3.jpg",target_size=(64,64))
    x=image.img_to_array(img)
    x=np.expand_dims(x,axis=0)
    y=np.argmax(model.predict(x),axis=1)
    # x_train.class_indices
    index=['daisy','dandelion','rose','sunflower','tulip']
    index[y[0]]
```

```
'daisy'
```

** percent of accuracy with this model** **Team ID : PNT2022TMID03893**