ASSIGNMENT-03

Build CNN Model for Classification Of Flowers

Assignment Date	05-October 2022
Student Name	Abarna S
Student Roll Number	922519205004
Maximum Marks	2 Marks

QUESTION 1:

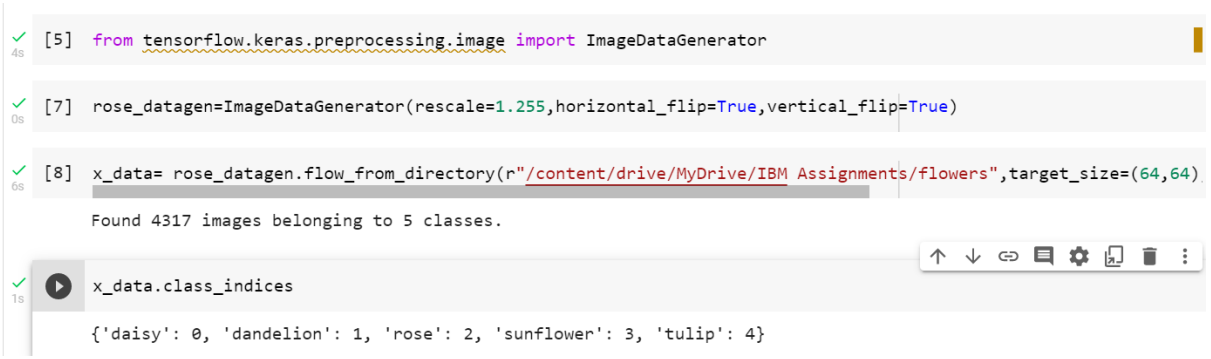
Download the Dataset

Dataset is downloaded and uploaded

QUESTION 2:

Image Augmentation

```
from tensorflow.keras.preprocessing.image import ImageDataGenerator
rose_datagen=ImageDataGenerator(rescale=1.255,horizontal_flip=True,vert
ical_flip=True)
x_data= rose_datagen.flow_from_directory(r"/content/drive/MyDrive/IBM A
ssignments/flowers",target_size=(64,64),class_mode="categorical",batch_
size=24)
x_data.class_indices
```



QUESTION 3:

Create Model

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

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

QUESTION 4:

Add Layers (Convolution,MaxPooling,Flatten,Dense-(Hidden Layers),Output

```
model.add(Convolution2D(34,(3,3),activation="relu",strides=(1,1),input_
shape=(64,64,3)))
model.add(MaxPooling2D(pool_size=(2,2)))
model.add(Flatten())
model.summary()
model.add(Dense(200,activation="relu"))
model.add(Dense(200,activation="relu"))
model.add(Dense(5,activation="softmax"))
```

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

[19] model = Sequential()

[20] model.add(Convolution2D(34,(3,3),activation="relu",strides=(1,1),input_shape=(64,64,3)))

[21] model.add(MaxPooling2D(pool_size=(2,2)))

[22] model.add(Flatten())
```

```
[23] model.summary()

Model: "sequential_2"
_________________________________________________________________
 Layer (type)                 Output Shape              Param #
=================================================================
 conv2d_1 (Conv2D)            (None, 62, 62, 34)        952

 max_pooling2d_1 (MaxPooling  (None, 31, 31, 34)       0
 2D)

 flatten_1 (Flatten)          (None, 32674)             0

=================================================================
Total params: 952
Trainable params: 952
Non-trainable params: 0
_________________________________________________________________

[24] model.add(Dense(200,activation="relu"))
     model.add(Dense(200,activation="relu"))

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

QUESTION 5:

Compile the Model

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

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

QUESTION 6:

Fit the model

```
model.fit(x_data, epochs= 5, steps_per_epoch= len(x_data) ,validation_data=0.0,validation_steps=0.0)
```

```
model.fit(x_data, epochs= 5, steps_per_epoch= len(x_data) ,validation_data=0.0,validation_steps=0.0)

Epoch 1/5
90/90 [==============================] - 34s 381ms/step - loss: 0.6416 - accuracy: 0.8110
Epoch 2/5
90/90 [==============================] - 34s 374ms/step - loss: 0.4987 - accuracy: 0.8425
Epoch 3/5
90/90 [==============================] - 35s 382ms/step - loss: 0.5009 - accuracy: 0.8443
Epoch 4/5
90/90 [==============================] - 34s 375ms/step - loss: 0.4476 - accuracy: 0.8647
Epoch 5/5
90/90 [==============================] - 36s 400ms/step - loss: 0.4143 - accuracy: 0.8663
<keras.callbacks.History at 0x7fab0c8f2690>
```

QUESTION 7:

Save the Model

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

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

QUESTION 8:

Test the Model

```
import numpy as np
from tensorflow.keras.models import load_model
from tensorflow.keras.preprocessing import image
img = image.load_img(r"/content/drive/MyDrive/IBM Assignments/flowers/rose/10090824183_d02c613f10_m.jpg")
img
```

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

```
[96] model = load_model('flowers.h5')
```

```
[99] .mg(r"/content/drive/MyDrive/IBM Assignments/flowers/rose/10503217854_e66a804309.jpg",target_size=(64,64))
```

```
img
```

```
x = image.img_to_array(img)
x
```

```
[101] x = image.img_to_array(img)
```

```
x
```

```
array([[[  0.,   2.,   0.],
        [  0.,   2.,   0.],
        [  0.,   2.,   0.],
        ...,
        [ 92.,  14.,   0.],
        [ 61.,  13.,   9.],
        [ 17.,   7.,   5.]],

       [[  0.,   2.,   0.],
        [  0.,   2.,   0.],
        [  0.,   2.,   0.],
        ...,
        [150.,   3.,   0.],
        [ 85.,  10.,   7.],
```

```
x=np.expand_dims(x,axis=0)
pred= model.predict(x)
```

```
[103] x=np.expand_dims(x,axis=0)
```

```
[104] pred=model.predict(x)
```

```
1/1 [==============================] - 0s 59ms/step
```

```
x_data.class_indices
```

```
[106] x_data.class_indices
0s

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

index=['daisy','dandelion','rose','sunflower','tulip']
0s
```

#predicting

```
index[np.argmax(pred)]

'rose'
```