ASSIGNMENT – 3

Assignment Date	07-10-2022
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Student Roll No.	510919205003
Maximum marks	2 marks

PROBLEM STATEMENT: Build CNN Model for Classification of Flowers.

QUESTION – 1:

DOWNLOAD THE DATASET

QUESTION – 2:

DATA/ IMAGE AUGMENTATION

QUESTION – 3:

TRAINING & TESTING

Training and Testing

```
train_datagen=ImageDataGenerator(rescale=1./255,zoom_range=0.2,horizontal_flip=True)
test_datagen=ImageDataGenerator(rescale=1./255)
```

```
In [9]: xtrain=train_datagen.flow_from_directory('M:\\software\\AI_TRAINING_IBM\\flowers',class_mode='categorical',target_size=(64,64),batch_size=100)

Found 4317 images belonging to 5 classes.

In [10]: xtest=test_datagen.flow_from_directory('M:\\software\\AI_TRAINING_IBM\\flowers',class_mode='categorical',target_size=(64,64),batch_size=100)

Found 4317 images belonging to 5 classes.
```

QUESTION

– 4 &

QUESTION - 5:

CREATE

MODEL:

ADD LAYERS

Importing the models and the layers

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

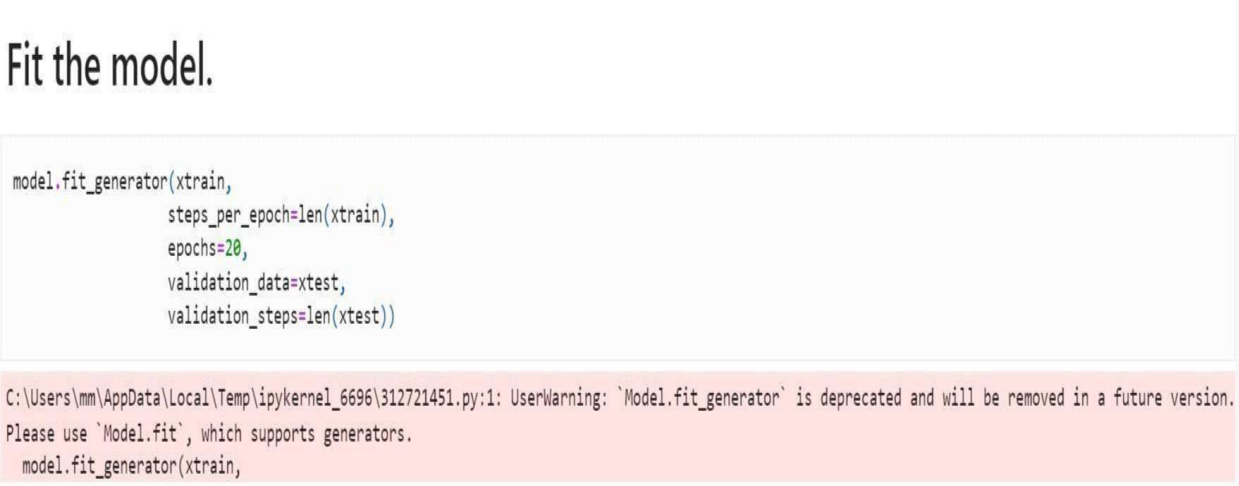
```
model=Sequential()
model.add(Convolution2D(64,(3,3),activation='relu',input_shape=(64,64,3)))
model.add(MaxPooling2D(pool_size=(2,2)))
model.add(Flatten())
model.add(Dense(300,activation='relu'))
model.add(Dense(150,activation='relu'))
model.add(Dense(5,activation='softmax'))
```

QUESTION – 6:

COMPILE THE MODEL:

QUESTION – 7:

FIT THE MODEL:




```
Epoch 1/20
  44/44 [==============================] - 37s 835ms/step - loss: 1.9038 - ac

  curacy: 0.3836 – Val loss: 1.1672 - Val accuracy:
0.5219Epoch 2/20
  44/44 [==============================] - 34s 779ms/step - loss: 1.0908 - ac
  curacy: 0.5606 – Val loss: 1.0398 - Val accuracy:
  0.5965Epoch 3/20
  44/44 [==============================] - 36s 815ms/step - loss: 1.0262 - ac
  curacy: 0.5925 – Val loss: 1.0038 - Val accuracy:
  0.6185Epoch 4/20
  44/44 [==============================] - 36s 823ms/step - loss: 0.9335 - ac
  curacy: 0.6410 – Val loss: 0.8923 - Val accuracy:
```

0.6560Epoch 5/20
44/44 [==============================] - 36s 809ms/step - loss: 0.8781 - ac
curacy: 0.6604 – Val loss: 0.8886 - Val accuracy:
0.6646Epoch 6/20
44/44 [==============================] - 34s 764ms/step - loss: 0.8512 - ac
curacy: 0.6713 – Val loss: 0.8784 - Val accuracy:
0.6771Epoch 7/20
44/44 [==============================] - 33s 758ms/step - loss: 0.7922 - ac
curacy: 0.6931 – Val loss: 0.7586 - Val accuracy:
0.7121Epoch 8/20
44/44 [==============================] - 35s 811ms/step - loss: 0.7471 - ac
curacy: 0.7107 – Val loss: 0.6955 - Val accuracy:
0.7262Epoch 9/20

44/44 [==============================]	- 35s 795ms/step	- loss:	0.7157	- ac
curacy: 0.7311 – Val loss: 0.6671 – Val	accuracy: 0.7482			
Epoch 10/20				
44/44 [==============================]	- 36s 817ms/step	- loss:	0.6867	- ac
curacy: 0.7336 – Val loss: 0.6537 - Val	accuracy: 0.7524			
Epoch 11/20				
44/44 [==============================]	- 37s 851ms/step	- loss:	0.6314	- ac
curacy: 0.7628 – Val loss: 0.6081 - Val	accuracy: 0.7751			
Epoch 12/20				
44/44 [==============================]	- 34s 773ms/step	- loss:	0.6109	- ac
curacy: 0.7744 – Val loss: 0.6052 - Val	accuracy: 0.7716			
Epoch 13/20				
44/44 [==============================]	- 34s 777ms/step	- loss:	0.5710	- ac
curacy: 0.7853 – Val loss: 0.5747 - Val	accuracy: 0.7760			
Epoch 14/20				
44/44 [==============================]	- 33s 763ms/step	- loss:	0.5516	- ac
curacy: 0.7924 – Val loss: 0.4951 - Val	accuracy: 0.8112			
Epoch 15/20				
44/44 [==============================]	- 34s 769ms/step	- loss:	0.5265	- ac
curacy: 0.8019 – Val loss: 0.4531 - Val	accuracy: 0.8334			
Epoch 16/20				
44/44 [==============================]	- 32s 721ms/step	- loss:	0.4957	- ac
curacy: 0.8177 – Val loss: 0.3755 - Val	accuracy: 0.8631			
Epoch 17/20				
44/44 [==============================]	- 32s 739ms/step	- loss:	0.4737	- ac
curacy: 0.8272 – Val loss: 0.5578 - Val	accuracy: 0.7797			
Epoch 18/20				
44/44 [==============================]	- 30s 680ms/step	- loss:	0.4653	- ac

curacy: 0.8274 - Val loss: 0.3953 - Val	accuracy: 0.8511			
Epoch 19/20				
44/44 [==============================]	- 25s 578ms/step	- loss:	0.4252	- ac
curacy: 0.8395 - Val loss: 0.3990 - Val	accuracy: 0.8550			
Epoch 20/20				
44/44 [==============================]	- 26s 597ms/step	- loss:	0.3946	- ac
curacy: 0.8529 - Val loss: 0.3112 - Val	accuracy: 0.8888			

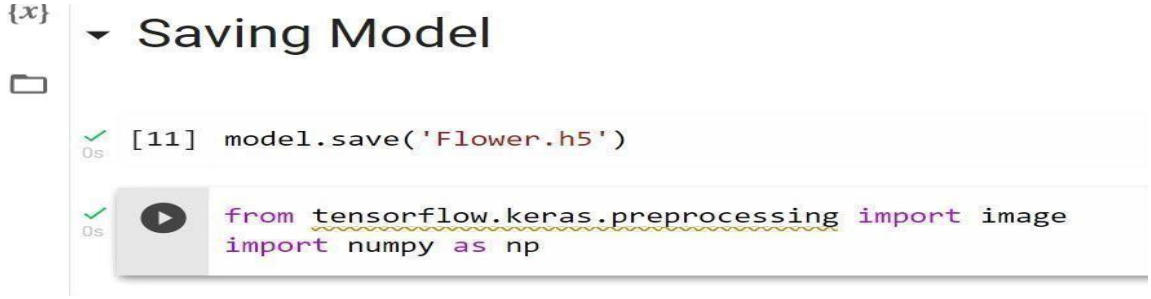
Out[19]:

```
<Keras.callbacks.History at 0x2b10b08c370>
```

QUESTION – 8:

SAVING THE

MODEL



QUESTION – 9:

TEST THE MODEL

Testing the model

In [22]:
```
img=image.load_img('M:\\software\\AI_TRAINING_IBM\\flowers\\sunflower\\6953297_8576bf4ea3.jpg',target_size=(64,64))
x=image.img_to_array(img)
x=np.expand_dims(x,axis=0)
prediction=np.argmax(model.predict(x))
op=['daisy','dandelion','rose','sunflower','tulip']
op[prediction]
```

```
1/1 [==============================] - 0s 22ms/step
```

Out[22]:
```
'sunflower'
```

QUESTION -10:

TESTING THE MODEL

In [24]:
```
img=image.load_img('M:\\software\\AI_TRAINING_IBM\\download.jpg',target_size=(64,64))#randomly downloaded testing
x=image.img_to_array(img)
x=np.expand_dims(x,axis=0)
prediction=np.argmax(model.predict(x))
op=['daisy','dandelion','rose','sunflower','tulip']
op[prediction]
```

```
1/1 [==============================] - 0s 22ms/step
```

Out[24]:
```
'sunflower'
```

In [ ]: