ASSIGNMENT-03

Build CNN Model for Classification Of Flowers

Assignment Date	5 October 2022
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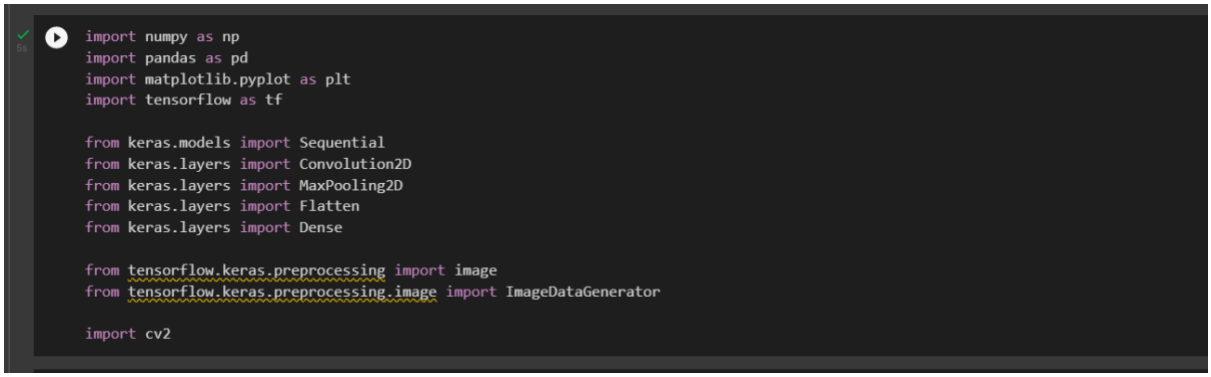
Maximum Marks	2 Marks

QUESTION 1:

Download the Dataset

Dataset is downloaded and uploaded



```
import numpy as np
import pandas as pd
import matplotlib.pyplot as plt
import tensorflow as tf

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

from tensorflow.keras.preprocessing import image
from tensorflow.keras.preprocessing.image import ImageDataGenerator

import cv2
```

QUESTION 2:

Image Augmentation

```
data_path = '/content/drive/MyDrive/CNN/flowers'
batch_size = 32
target_size = (64, 64)


train_datagen = ImageDataGenerator(rescale=1./255,
                                   shear_range=0.2,
                                   zoom_range=0.2,
                                   width_shift_range=0.1,
                                   height_shift_range=0.1,
                                   horizontal_flip=True,
                                   validation_split=0.2)

test_datagen = ImageDataGenerator(rescale=1. / 255, validation_split=0.2)


X_train = train_datagen.flow_from_directory(data_path,
                                            target_size=target_size,
                                            batch_size=batch_size,
```

```
                                                subset="training",
                                                class_mode = 'categorical')


X_test = test_datagen.flow_from_directory(data_path,
                                                target_size=target_size,
                                                batch_size=batch_size,
                                                subset="validation",
                                                class_mode='categorical')
```

```
[2] data_path = '/content/drive/MyDrive/CNN/flowers'
    batch_size = 32
    target_size = (64, 64)
```

```
[3] train_datagen = ImageDataGenerator(rescale=1./255,
                                       shear_range=0.2,
                                       zoom_range=0.2,
                                       width_shift_range=0.1,
                                       height_shift_range=0.1,
                                       horizontal_flip=True,
                                       validation_split=0.2)

    test_datagen = ImageDataGenerator(rescale=1. / 255, validation_split=0.2)
```

```
[4] X_train = train_datagen.flow_from_directory(data_path,
                                                target_size=target_size,
                                                batch_size=batch_size,
                                                subset="training",
                                                class_mode = 'categorical')



    X_test = test_datagen.flow_from_directory(data_path,
                                              target_size=target_size,
                                              batch_size=batch_size,
                                              subset="validation",
                                              class_mode='categorical')

    Found 16 images belonging to 5 classes.
    Found 4 images belonging to 5 classes.
```

<u>QUESTION 3:</u>

Create Model

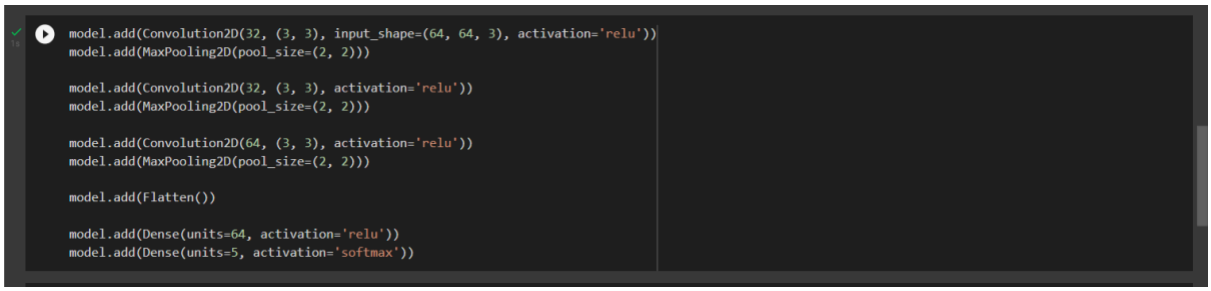
```
model = Sequential()
```

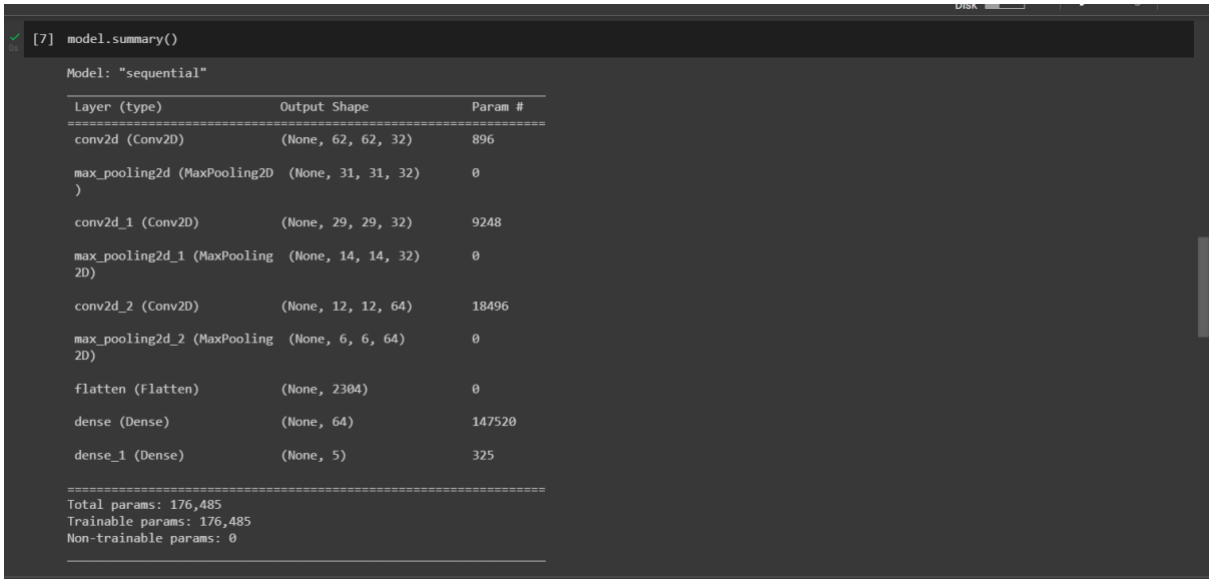
```
+ Code + Text

[5] model = Sequential()
```

QUESTION 4:

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

```
model.add(Convolution2D(32, (3, 3), input_shape=(64, 64, 3),
activation='relu'))
model.add(MaxPooling2D(pool_size=(2, 2)))

model.add(Convolution2D(32, (3, 3), activation='relu'))
model.add(MaxPooling2D(pool_size=(2, 2)))

model.add(Convolution2D(64, (3, 3), activation='relu'))
model.add(MaxPooling2D(pool_size=(2, 2)))

model.add(Flatten())

model.add(Dense(units=64, activation='relu'))
model.add(Dense(units=5, activation='softmax'))

model.summary()
```

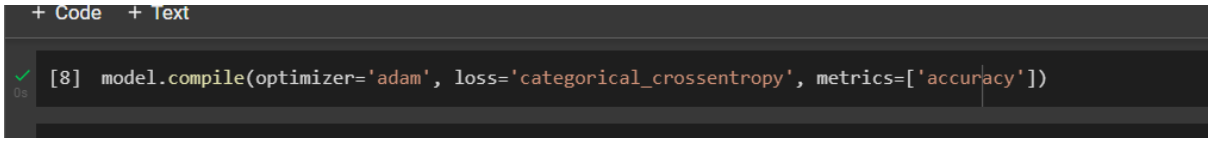




QUESTION 5:

Compile the Model

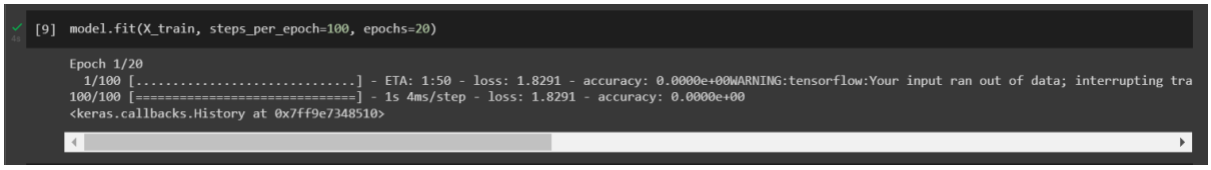
```
model.compile(optimizer='adam', loss='categorical_crossentropy',
metrics=['accuracy'])
```



QUESTION 6:

Fit the model

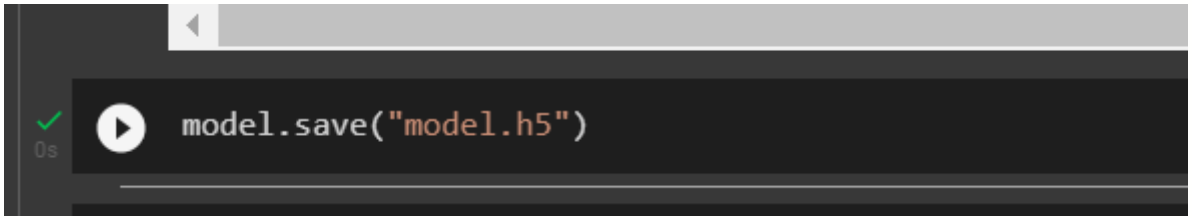
```
model.fit(X_train, steps_per_epoch=100, epochs=20)
```



QUESTION 7:

Save the Model

```
model.save("model.h5")
```



QUESTION 8:

Test the Model

```
def predict():
    img =
image.load_img("/content/drive/MyDrive/CNN/flowers/rose/118974357_0faa23cce
9_n.jpg", target_size=target_size)
    x = image.img_to_array(img)
    x = tf.expand_dims(x,0)

    labels = ['daisy', 'dandelion', 'rose', 'sunflower', 'tulip']

    pred = model.predict(x)
    prediction = labels[np.argmax(pred[0])]
```

```
    print(f'The given image is a {prediction}')

plt.imshow(plt.imread("/content/drive/MyDrive/CNN/flowers/rose/118974357_0f
aa23cce9_n.jpg"))
    plt.axis('off')
    plt.show()


predict()
```