Assignment -3
CNN Model for Classification Of Flowers

Assignment Date	03 October 2022
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Maximum Marks	2 Marks

1.Download The Dataset

Input:

```
from google.colab import drive
drive.mount('/content/drive')
```

output :

Mounted at /content/drive

#Import Lib

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

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

2.Image Augmentation

Input :

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

test_datagen=ImageDataGenerator(rescale=1./255)

x_train = train_datagen.flow_from_directory(r"/content/drive/MyDrive/flowers",target_size=(64,64),
batch_size=32,class_mode="categorical")
```

#load your images data

Input :

```
x_test = test_datagen.flow_from_directory(r"/content/drive/MyDrive/flowers",target_size=(64,64),
batch_size=32,class_mode="categorical")
```

Output :

Found 4317 images belonging to 6 classes.

Input :

x_train.class_indices

Output:

{'.tmp.driveupload': 0,
'daisy': 1,
'dandelion': 2,
'rose': 3,
'sunflower': 4,
'tulip': 5}

3.Create a Model

#initialize the model

model=Sequential()

4.AddLayers(Convolution,MaxPooling,Flatten,Dense(Hidden,layers)output)

Import Lib :

import keras
from keras.models import Sequential
from keras.layers import Dense, Dropout, Flatten

#add convolution layer

model.add(Convolution2D(32,(3,3),input_shape=(64,64,3),activation='relu'))

#add max pooling layer

model.add(MaxPooling2D(pool_size = (2,2)))

model.add(Flatten())

#hidden layers

model.add(Dense(units=300,kernel_initializer="random_uniform",activation="relu"))
model.add(Dense(units=200,kernel_initializer="random_uniform",activation="relu"))

#output layer

model.add(Dense(units=4,kernel_initializer="random_uniform",activation="softmax"))

5.Compile the model

#compile the model

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

6.Fit the model

```
model.fit_generator(x_train,steps_per_epoch=39,epochs=25,validation_data=x_test,validation_steps=10)
```

7.Save the model

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

8.Test the model

#CNN prediction

```
from tensorflow.keras.models import load_model

from tensorflow.keras.preprocessing import image

import numpy as np

model = load_model('/content/flowers.h5')

img = image.load_img('/content/drive/MyDrive/flowers/sunflower/1022552002_2b93faf9e7_n.jpg',
target_size=(64,64))
```

Input :

```
img
```

Output:

Input :

type(img)

Output :

PIL.Image.Image

x=image.img_to_array(img)

Input :

x

Input :

array([[[197., 207., 234.],
[191., 202., 230.],
[194., 206., 232.],
...,
[165., 182., 212.],
[159., 182., 216.],
[154., 174., 207.]],

[[197., 205., 228.],
[200., 206., 232.],
[203., 211., 234.],
...,
[159., 179., 212.],
[160., 177., 207.],
[168., 185., 215.]],

[[206., 212., 234.],
[205., 211., 233.],
[207., 214., 233.],
...,

[181., 190., 221.],
[164., 180., 214.],
[161., 180., 213.]],
...,

[[89., 96., 65.],
[131., 134., 103.],
[124., 139., 110.],
...,

[127., 147., 110.],
[154., 170., 134.],
[163., 178., 149.]],

[[112., 123., 91.],
[152., 155., 128.],
[98., 99., 67.],
...,

[126., 143., 111.],
[151., 164., 136.],
[143., 156., 128.]],

[[114., 140., 105.],
[60., 85., 53.],
[132., 126., 100.],
...,
[152., 167., 136.],
[134., 148., 122.],
[146., 161., 128.]]], dtype=float32)

Input :

x.shape

Output :

(64, 64, 3)

x=np.expand_dims(x,axis=0)

Input :

pred_prob=model.predict(x)

Output :

1/1 [==============================] - 0s 414ms/step

pred_prob

```
class_name=['daisy','dandelion','sunflower','rose']

pred_id=pred_prob.argmax(axis=1)[0]
```

Input :

```
pred_id
```

Output :

2

Input :

```
print('Predicted flower is',str(class_name[pred_id]))
```

Output :

Predicted flower is sunflower