Assignment -3

Build CNN Model for Classification Of Flowers

Assignment Date	30 September 2022
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Maximum Marks	2 Marks

Question-1:

Download the dataset

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=True)
test_datagen=ImageDataGenerator(rescale=1./255)
```

Question-3:

Create model

Solution

```
from tensorflow.keras.models import Sequential
from tensorflow.keras.layers import Dense,Convolution2D,MaxPooling2D,Flatten
model=Sequential()
```

3)Create Model

```
[ ] from tensorflow.keras.models import Sequential

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

[ ] model=Sequential()
```

Question-4:

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

Solution

a)Convolution Layer

model.add(Convolution2D(32,(3,3),kernel_initializer="random_uniform",activation="relu",strides=(1,1),input_shape=(64,64,3)))

b)MaxPooling Layer

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

c)Flatten Layer

model.add(Flatten())

d)Dense(Hidden layer)

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

e)Output layer

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

a)Convolution Layer

```
[ ] model.add(Convolution2D(32,(3,3),kernel_initializer="random_uniform",activation="relu",strides=(1,1),input_shape=(64,64,3)))
```

b)MaxPooling Layer

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

c)Flatten

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

d)Dense(Hidden layer)

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```

e)Output layer

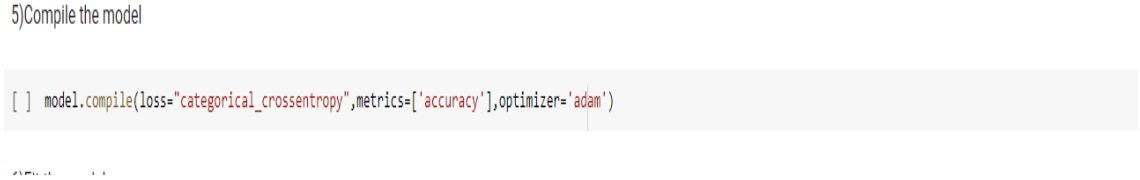
```
model.add(Dense(5,activation="softmax"))
```

Question-5:

Compile The Model

Solution

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

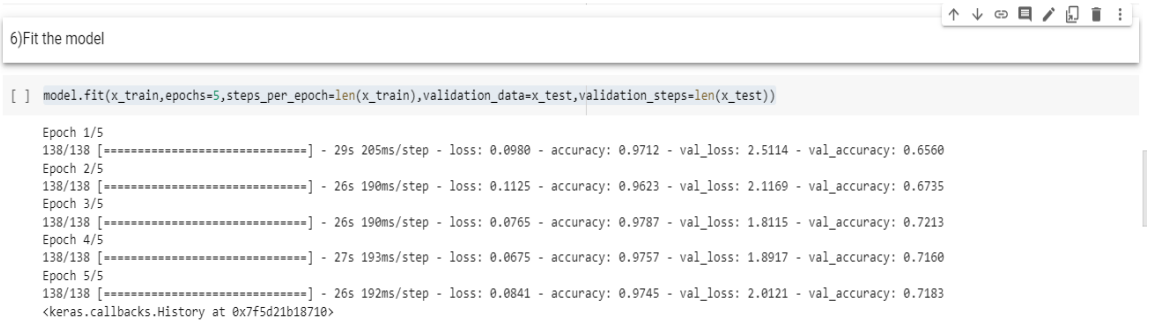


Question-6:

Fit The Model

Solution

```
model.fit(x_train,epochs=5,steps_per_epoch=len(x_train),validation_data=x_test,validation_steps=len(x_test))
```

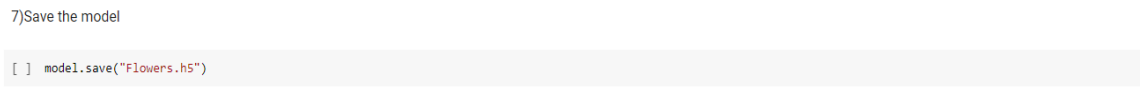


Question-7:

Save The Model

Solution

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



Question-8:

Test The Model

Solution

```
import numpy as np
from tensorflow.keras.models import load_model
from tensorflow.keras.preprocessing import image
model=load_model("Flowers.h5")
img=image.load_img(r"/content/drive/MyDrive/Assignment 3/Flowers-Dataset/Testing/daisy/14333681205_a07c9f1752_m.jpg",target_size=(64,64))
x=image.img_to_array(img)
x=np.expand_dims(x,axis=0)
pred=model.predict(x)
pred
index=['daisy','dandelion','rose','sunflower','tulip']
index[np.argmax(pred)]
```

8)Test the model

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

```
[ ] model=load_model("Flowers.h5")
```

```
[ ] img=image.load_img(r"/content/drive/MyDrive/Assignment 3/Flowers-Dataset/Testing/daisy/14333681205_a07c9f1752_m.jpg",target_size=(64,64))
```

```
[ ] img
```

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

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

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

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

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

```
[ ] pred
    array([[1., 0., 0., 0., 0.]], dtype=float32)
```

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

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