

ASSIGNMENT-3

Assignment Date	30 September 2022
Student Na	K.Yoka Muthu Nivethitha
Student Roll Number	962719106040
Maximum Marks	2 Marks

1. Download the Dataset

Link: https://drive.google.com/file/d/1zZ87e7GDpN90-Sa_AKbvMm3EEfQkEQ_R/view

2. Image

Augmentation

Solution:

```
pwd
from tensorflow.keras.preprocessing.image import ImageDataGenerator
train_datagen=ImageDataGenerator(rescale=1./255,zoom_range=0.2,horizontal_flip=True,vertical_flip=False)
test_datagen=ImageDataGenerator(rescale=1./255)
ls
pwd
x_train=train_datagen.flow_from_directory(r"/content/drive/MyDrive/flowers",target_size=(64,64),
                                         class_mode='categorical',batch_size=24)
x_test=test_datagen.flow_from_directory(r"/content/drive/MyDrive/flowers",target_size=(64,64),
                                       class_mode='categorical',batch_size=24)
x_train.class_indices
```



The screenshot shows a Jupyter Notebook titled "Image Augmentation" with the following code cells and their outputs:

- Cell [9]: `pwd` → `'/content/drive/MyDrive'`
- Cell [10]: `from tensorflow.keras.preprocessing.image import ImageDataGenerator` → (No output)
- Cell [11]: `train_datagen=ImageDataGenerator(rescale=1./255,zoom_range=0.2,horizontal_flip=True,vertical_flip=False)` → (No output)
- Cell [12]: `test_datagen=ImageDataGenerator(rescale=1./255)` → (No output)
- Cell [13]: `ls` →

```
685imguf_NAD-student-registration-Process19.pdf  Flowers-Dataset.zip
Classroom/                                       'Getting started.pdf'
'Colab Notebooks'/                             'Student Registration'
flowers/                                         'Student Registration (1)'
```
- Cell [14]: `pwd` → `'/content/drive/MyDrive'`

```
FLOWERS 3/
DOCUMENT REGISTRATION (1)

[14] pwd
'/content/drive/MyDrive'

[15] x_train=train_datagen.flow_from_directory(r"/content/drive/MyDrive/flowers",target_size=(64,64),
class_mode='categorical',batch_size=24)

Found 4317 images belonging to 6 classes.

[16] x_test=test_datagen.flow_from_directory(r"/content/drive/MyDrive/flowers",target_size=(64,64),
class_mode='categorical',batch_size=24)

Found 4317 images belonging to 6 classes.

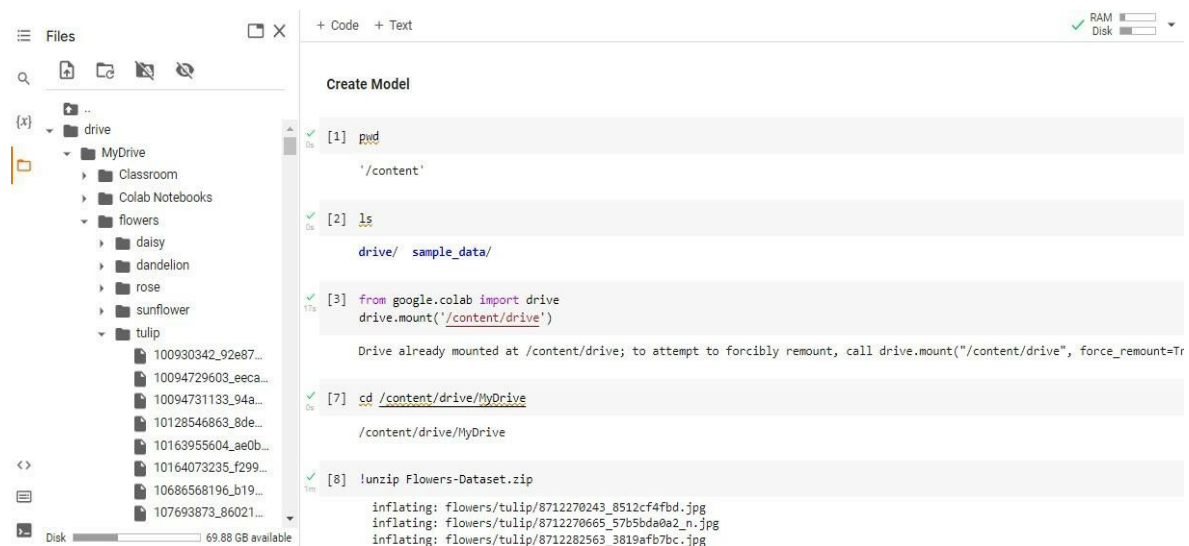
[18] x_train.class_indices
{'ipynb_checkpoints': 0,
 'daisy': 1,
 'dandelion': 2,
 'rose': 3,
 'sunflower': 4,
 'tulip': 5}
```

3. Create

Model

Solution:

```
pwd
ls
from google.colab import drive
drive.mount('/content/drive')
cd /content/drive/MyDrive
!unzip Flowers-Dataset.zip
```



The screenshot shows a Google Colab interface. On the left, a file explorer displays the directory structure: drive > MyDrive > flowers > tulip. The main area contains a code editor with the following code:

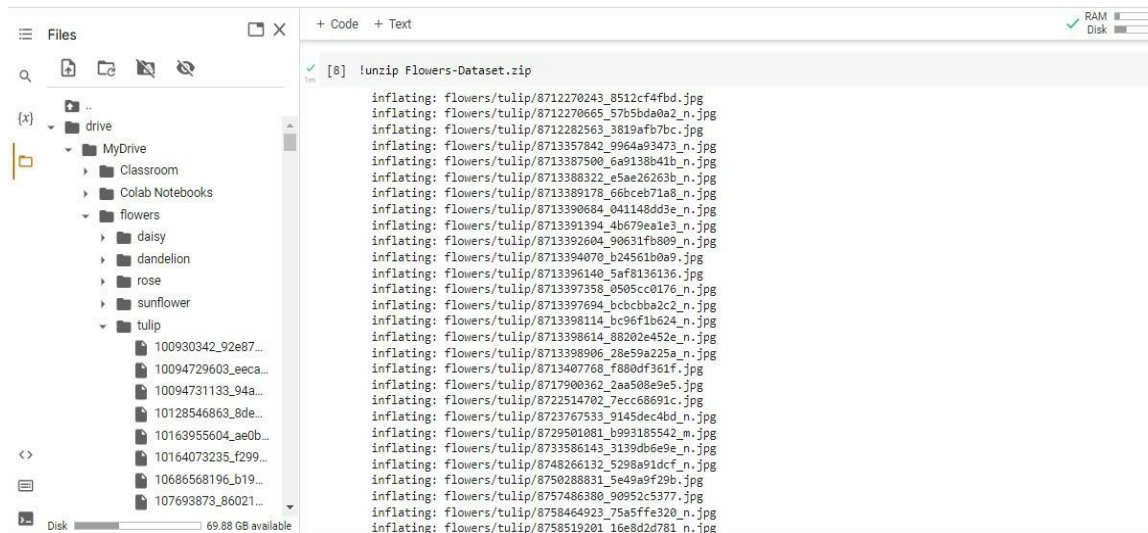
```
[1] pwd
'/content'

[2] ls
drive/ sample_data/

[3] from google.colab import drive
drive.mount('/content/drive')
Drive already mounted at /content/drive; to attempt to forcibly remount, call drive.mount("/content/drive", force_remount=True)

[7] cd /content/drive/MyDrive
/content/drive/MyDrive

[8] !unzip Flowers-Dataset.zip
inflating: flowers/tulip/8712270243_8512cf4fbd.jpg
inflating: flowers/tulip/8712270665_57b5bda0a2_n.jpg
inflating: flowers/tulip/8712282563_3819afb7bc.jpg
```



4. Add Layers(Convolution,Maxpooling,Flatten,Dense-(Hidden

Layers),Output) Solution:

```
from tensorflow.keras.models import Sequential
from tensorflow.keras.layers import
Dense,Convolution2D,MaxPooling2D,Flatten model=Sequential()
model.add(Convolution2D(32,(3,3),input_shape=(64,64,3),activation='relu'))
model.add(MaxPooling2D(pool_size=(2,2)))
model.add(Flatten())
model.summary()
32*(3*3*3+1)
```

Hidden layer

```
model.add(Dense(300,activation='relu'))
model.add(Dense(150,activation='relu'))
```

Output layer

```
model.add(Dense(4,activation='softmax'))
```



```
[24] model.summary()

Model: "sequential"
-----
Layer (type)                Output Shape         Param #
-----
conv2d (Conv2D)              (None, 62, 62, 32)   896
max_pooling2d (MaxPooling2D) (None, 31, 31, 32)    0
flatten (Flatten)             (None, 30752)         0
-----
Total params: 896
Trainable params: 896
Non-trainable params: 0

[25] 32*(3*3*3+1)

896

Hidden Layers

[26] model.add(Dense(300,activation='relu'))
```

```
[25] 32*(3*3*3+1)

896

Hidden Layers

[26] model.add(Dense(300,activation='relu'))
model.add(Dense(150,activation='relu'))

Output Layers

[27] model.add(Dense(4,activation='softmax'))

Compile the model

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

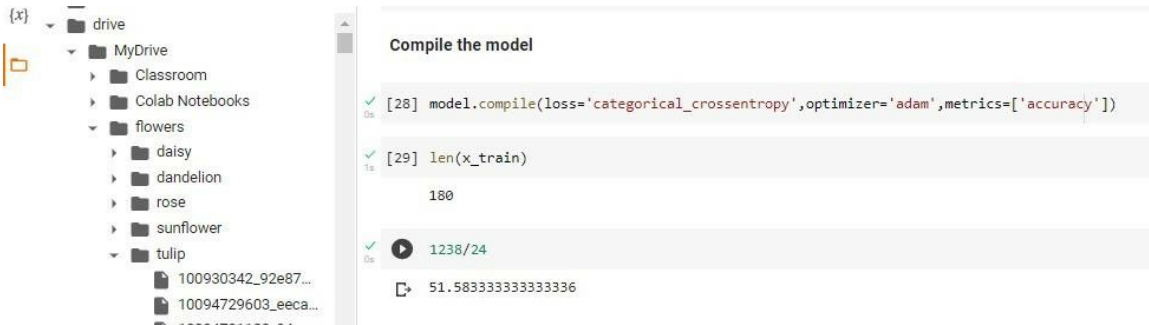
[29] len(x_train)

180
```

5. Compile The

Model Solution:

```
model.compile(loss='categorical_crossentropy',optimizer='adam',metrics=['accuracy'])
len(x_train)
1238/24
```

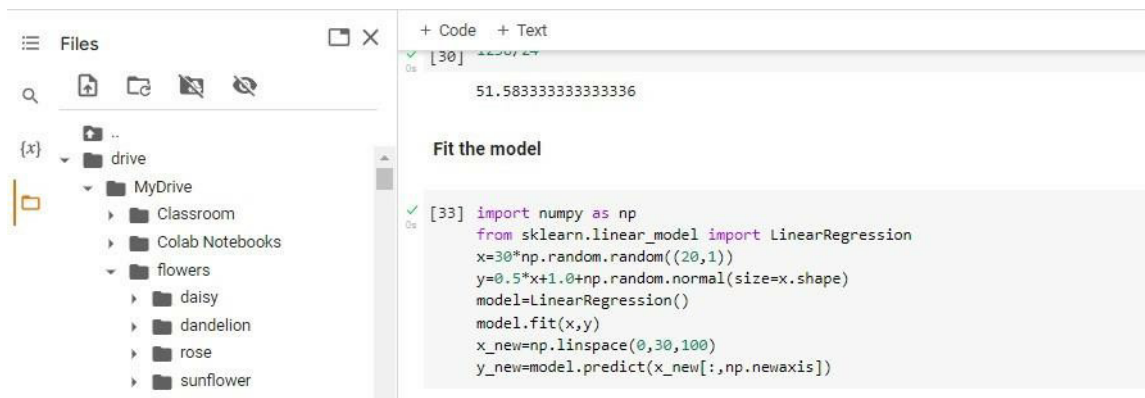


6. Fit The

Model

Solution:

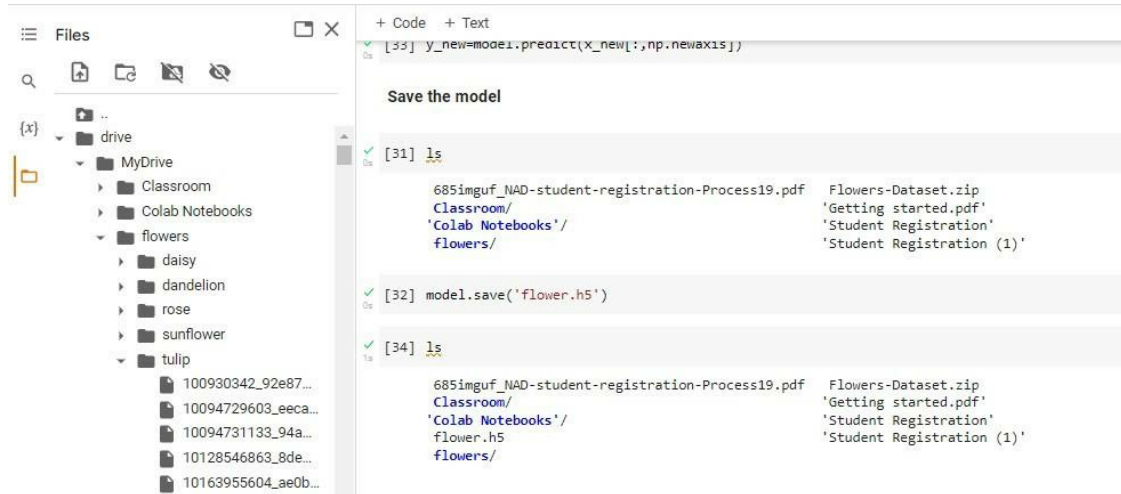
```
import numpy as np
from sklearn.linear_model import LinearRegression
x=30*np.random.random((20,1))
y=0.5*x+1.0+np.random.normal(size=x.shape)
model=LinearRegression()
model.fit(x,y)
x_new=np.linspace(0,30,100)
y_new=model.predict(x_new[:,np.newaxis])
```



7. Save The

Model Solution:

```
ls
model.save('flower.h5')
ls
```



8. Test The

Model Solution:

```
import numpy as np
from tensorflow.keras.models import load_model
from tensorflow.keras.preprocessing import image
#load the model
model=load_model('flower.h5')
img=image.load_img(r"/content/drive/MyDrive/flowers/rose/10503217854_e66a804309.jpg")
img
img=image.load_img(r"/content/drive/MyDrive/flowers/rose/10503217854_e66a804309.jpg",target_size=(64,64))
img
x=image.img_to_array(img)
x
x=np.expand_dims(x,axis=0)
x
y=np.argmax(model.predict(x),axis=1)
y
x_train.class_indices
index=['daisy','dandelion','rose','sunflower','tulip']
index[y[0]]

img=image.load_img(r"/content/drive/MyDrive/flowers/daisy/100080576_f52e8ee070_n.jpg",target_size=(64,64))
x=image.img_to_array(img)
x=np.expand_dims(x,axis=0)
y=np.argmax(model.predict(x),axis=1)
index=['daisy','dandelion','rose','sunflower','tulip']
index[y[0]]

img=image.load_img(r"/content/drive/MyDrive/flowers/dandelion/10043234166_e6dd915111_n.jpg",target_size=(64,64))
```

```
img=image.load_img(r"/content/drive/MyDrive/flowers/rose/10090824183_d02c613f10_m.jpg",
target_size=(64,64))
x=image.img_to_array(img)
x=np.expand_dims(x,axis=0)
y=np.argmax(model.predict(x),axis=1)
index=['daisy', 'dandelion', 'rose', 'sunflower', 'tulip']
index[y[0]]
```

```
img=image.load_img(r"/content/drive/MyDrive/flowers/tulip/100930342_92e8746431_n.jpg",
target_size=(64,64))
x=image.img_to_array(img)
x=np.expand_dims(x,axis=0)
y=np.argmax(model.predict(x),axis=1)
index=['daisy', 'dandelion', 'rose', 'sunflower', 'tulip']
index[y[0]]
```

A close-up, high-angle shot of a vast field of orange roses. The roses are in various stages of bloom, with some fully open and others just beginning to unfurl. The petals are a vibrant orange color, and the overall scene is a sea of these flowers, creating a textured and colorful background.


```
{x} drive
  MyDrive
    Classroom
    Colab Notebooks
    flowers
      daisy
      dandelion
      rose
      sunflower
      tulip
        100930342_92e87...
        10094729603_eeca...
        10094731133_94a...
        10128546863_8de...
        10163955604_ae0b...
        10164073235_f299...
        10686568196_b19...
        107693873_86021...

[42] y=np.argmax(model.predict(x),axis=1)
y
array([3])

[43] x_train.class_indices
{'ipynb_checkpoints': 0,
 'daisy': 1,
 'dandelion': 2,
 'rose': 3,
 'sunflower': 4,
 'tulip': 5}

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

[46] index[y[0]]
'sunflower'

[50] img=image.load_img(r"/content/drive/MyDrive/flowers/daisy/100080576_f52e8ee070_n.jpg",target_size=(64,64))
x=image.img_to_array(img)
```

```
Files + Code + Text RAM Disk
{x} drive
  MyDrive
    Classroom
    Colab Notebooks
    flowers
      daisy
      dandelion
      rose
      sunflower
      tulip
        100930342_92e87...
        10094729603_eeca...
        10094731133_94a...
        10128546863_8de...
        10163955604_ae0b...
        10164073235_f299...
        10686568196_b19...
        107693873_86021...

[50] img=image.load_img(r"/content/drive/MyDrive/flowers/daisy/100080576_f52e8ee070_n.jpg",target_size=(64,64))
x=image.img_to_array(img)
x=np.expand_dims(x,axis=0)
y=np.argmax(model.predict(x),axis=1)
index=['daisy','dandelion','rose','sunflower','tulip']
index[y[0]]
'sunflower'

[51] img=image.load_img(r"/content/drive/MyDrive/flowers/dandelion/10043234166_e6dd915111_n.jpg",target_size=(64,64))
x=image.img_to_array(img)
x=np.expand_dims(x,axis=0)
y=np.argmax(model.predict(x),axis=1)
index=['daisy','dandelion','rose','sunflower','tulip']
index[y[0]]
'rose'

[52] img=image.load_img(r"/content/drive/MyDrive/flowers/rose/10090824183_d02c613f10_m.jpg",target_size=(64,64))
x=image.img_to_array(img)
x=np.expand_dims(x,axis=0)
y=np.argmax(model.predict(x),axis=1)
index=['daisy','dandelion','rose','sunflower','tulip']
index[y[0]]
'sunflower'
```

```
Files + Code + Text RAM Disk
{x} drive
  MyDrive
    Classroom
    Colab Notebooks
    flowers
      daisy
      dandelion
      rose
      sunflower
      tulip
        100930342_92e87...
        10094729603_eeca...
        10094731133_94a...
        10128546863_8de...
        10163955604_ae0b...
        10164073235_f299...
        10686568196_b19...
        107693873_86021...

img=image.load_img(r"/content/drive/MyDrive/flowers/sunflower/1006300120_0927030d.jpg",target_size=(64,64))
x=image.img_to_array(img)
x=np.expand_dims(x,axis=0)
y=np.argmax(model.predict(x),axis=1)
index=['daisy','dandelion','rose','sunflower','tulip']
index[y[0]]
'rose'

[54] img=image.load_img(r"/content/drive/MyDrive/flowers/tulip/100930342_92e8746431_n.jpg",target_size=(64,64))
x=image.img_to_array(img)
x=np.expand_dims(x,axis=0)
y=np.argmax(model.predict(x),axis=1)
index=['daisy','dandelion','rose','sunflower','tulip']
index[y[0]]
'dandelion'
```