

ASSIGNMENT-3

Assignment Date	30 September 2022
Student Name	A.Sivalakshmi
Student Roll Number	962719106032
Maximum Marks	2 Marks

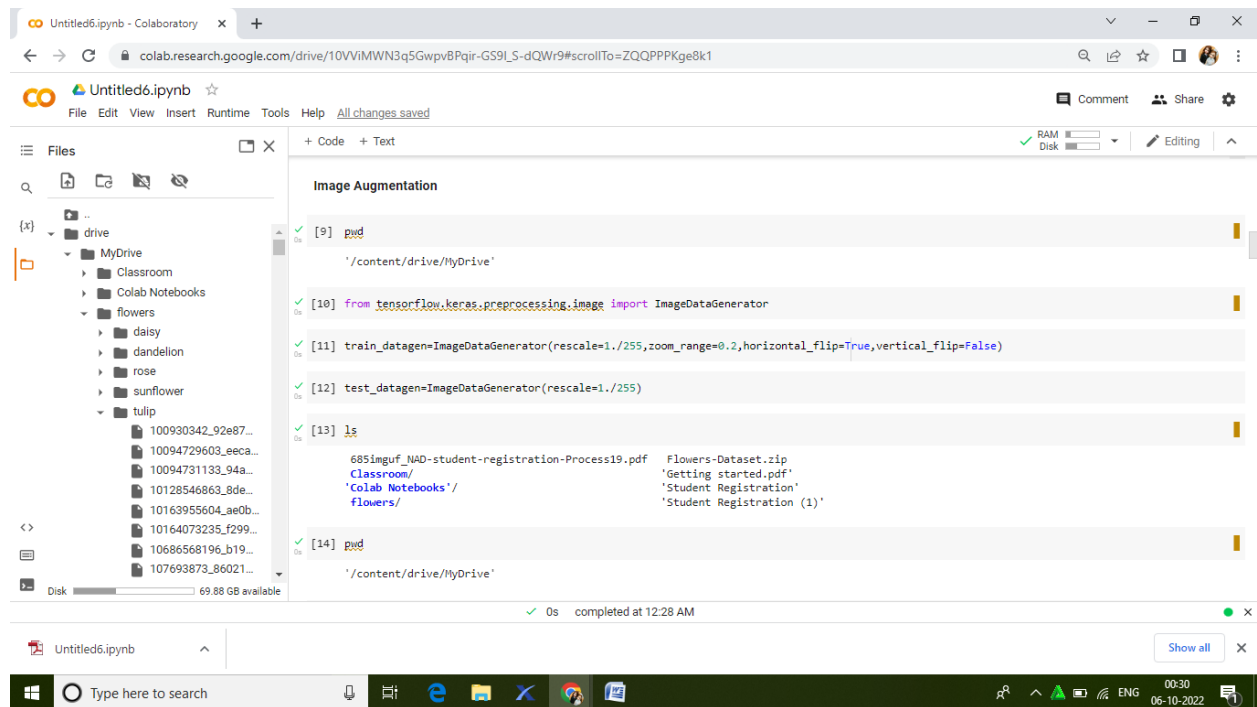
1.Download the Dataset

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

2.Image Augmentation

Solution:

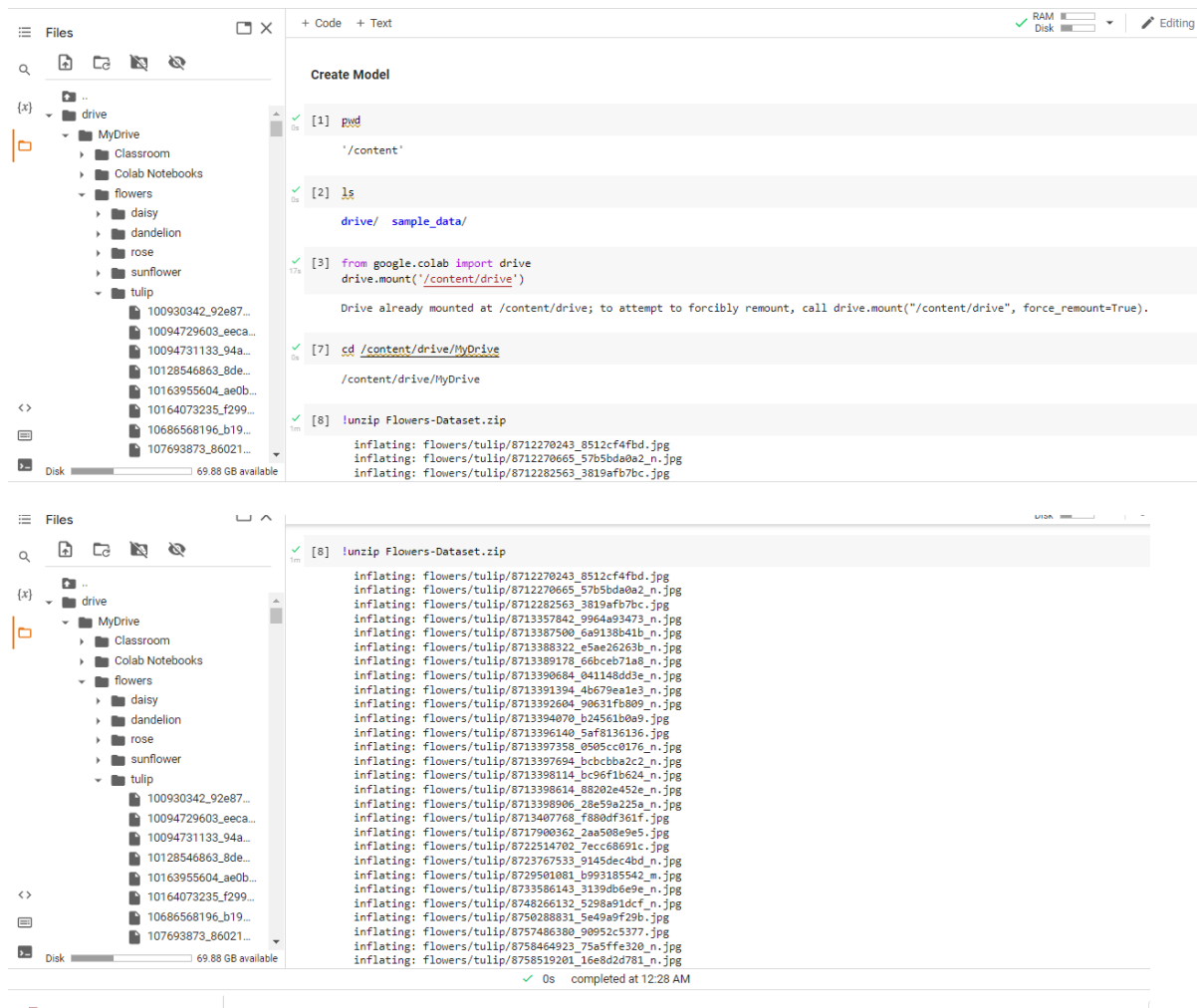
```
pwd
from tensorflow.keras.preprocessing.image import ImageDataGenerator
train_datagen=ImageDataGenerator(rescale=1./255, zoom_range=0.2, horizontal_flip=True, vertical_flip=False)
test_datagen=ImageDataGenerator(rescale=1./255)
ls
pwd
x_train=train_datagen.flow_from_directory(r"/content/drive/MyDrive/flowers", 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
```



3.Create Model

Solution:

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



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'))
```

Files

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...

69.88 GB available

+ Code + Text

[18] 'dandelion': 2,
'rose': 3,
'sunflower': 4,
'tulip': 5}

Add Layers

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

[20] model=Sequential()

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

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

[23] model.add(Flatten())

[24] model.summary()

Model: "sequential"

Layer (type)	Output Shape	Param #

Files

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...

69.88 GB available

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[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'))

Files

drive

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flowers

daisy

dandelion

rose

sunflower

tulip

100930342_92e87...

10094729603_eeca...

10094731133_94a...

10128546863_8de...

10163955604_ae0b...

10164073235_f299...

10686568196_b19...

107693873_86021...

69.88 GB available

+ Code + Text

[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:

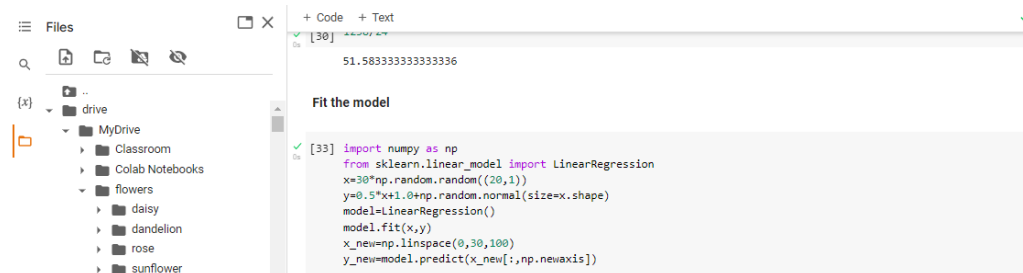
```
model.compile(loss='categorical_crossentropy',optimizer='adam',metrics=['accuracy'])
len(x_train)
1238/24
```



6. Fit The Model

Solution:

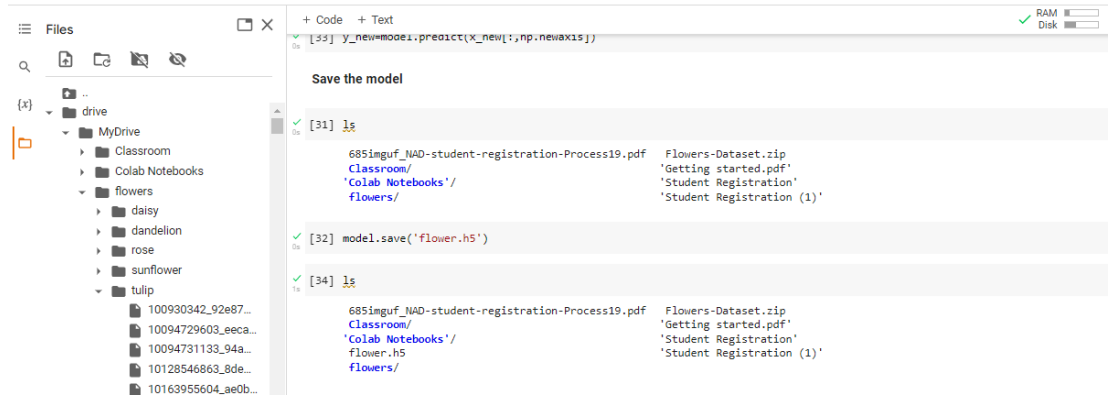
```
import numpy as np
from sklearn.linear_model import LinearRegression
x=30*np.random.random((20,1))
y=0.5*x+1.0+np.random.normal(size=x.shape)
model=LinearRegression()
model.fit(x,y)
x_new=np.linspace(0,30,100)
y_new=model.predict(x_new[:,np.newaxis])
```



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",t
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))
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/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/sunflower/1008566138_6927679c8a.jp
g",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]]
```

Files

drive

MyDrive

Classroom

Colab Notebooks

flowers

daisy

dandelion

rose

10090824183_d02c...

102501987_3cdb8...

10503217854_e66...

10894627425_ec76...

110472418_87b6a...

11102341464_508...

11233672494_d8bf...

11694025703_9a9...

118974357_ofaa23...

11944957684_2cc...

69.87 GB available


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Test the model

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

[36] #load the model
model=load_model('flower.h5')

[55] img=image.load_img(r"/content/drive/MyDrive/flowers/rose/10090824183_d02c613f10_m.jpg")
img



Files

drive

MyDrive

Classroom

Colab Notebooks

flowers

daisy

dandelion

rose

10090824183_d02c...

102501987_3cdb8...

10503217854_e66...

10894627425_ec76...

110472418_87b6a...

11102341464_508...

11233672494_d8bf...

11694025703_9a9...

118974357_ofaa23...

11944957684_2cc...

69.87 GB available

+ Code + Text

img=image.load_img(r"/content/drive/MyDrive/flowers/rose/10090824183_d02c613f10_m.jpg",target_size=(224,224))
img

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

array([[[0., 2., 0.],
 [0., 2., 0.],
 [0., 2., 0.],
 ...,
 [92., 14., 0.],
 [61., 13., 9.],
 [17., 7., 5.]],
 [[0., 2., 0.],
 [0., 2., 0.],
 [0., 2., 0.],
 ...,
 [150., 3., 0.],
 [85., 10., 7.],
 [119., 4., 1.]])

Files

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...

69.88 GB available

+ Code + Text

[40] [[1., 2., 0.],
 [0., 2., 0.],
 [1., 1., 0.],
 ...,
 [29., 5., 1.],
 [41., 13., 0.],
 [5., 4., 0.]], dtype=float32)

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

array([[[0., 2., 0.],
 [0., 2., 0.],
 [0., 2., 0.],
 ...,
 [92., 14., 0.],
 [61., 13., 9.],
 [17., 7., 5.]],
 [[0., 2., 0.],
 [0., 2., 0.],
 [0., 2., 0.],
 ...,
 [150., 3., 0.],
 [85., 10., 7.],
 [119., 4., 1.]])


```
Files
(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...

[41] [ 41., 13., 0.],
      [ 5., 4., 0.]], dtype=float32)

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

```
Untitled6.ipynb
File Edit View Insert Runtime Tools Help All changes saved Comment

[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_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'
```

```
Files
(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...

[53] img=image.load_img(r"/content/drive/MyDrive/flowers/sunflower/1000300000_092f079f000f.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'
```