ASSIGNMENT-3

Assignment Date	30 September 2022
Student Name	R.Sornamala
Student Roll Number	962719106034
Maximum Marks	2 Marks

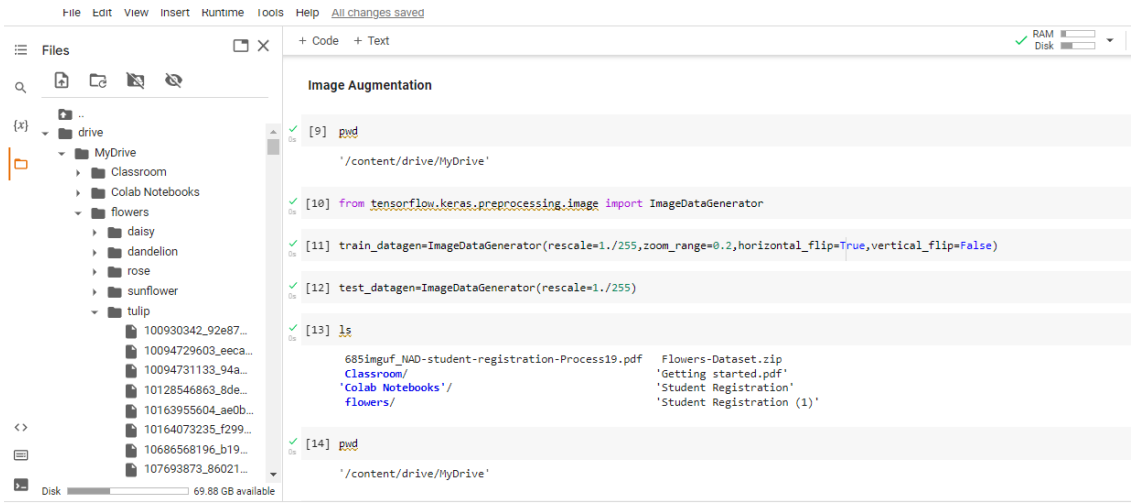
1.Download the Dataset

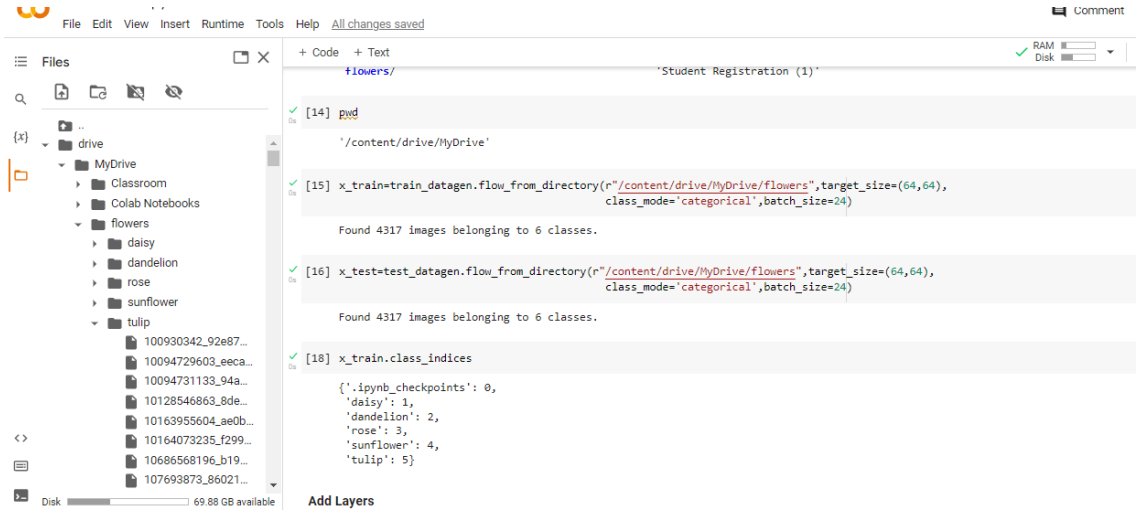
Link: https://drive.google.com/file/d/1zZ87e7GDpN90-Sa_AKbvMm3EEfQkEQ_R/view

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,ve
rtical_flip=False)
test_datagen=ImageDataGenerator(rescale=1./255)
ls
pwd
x_train=train_datagen.flow_from_directory(r"/content/drive/MyDrive/flowers",target_siz
e=(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
```

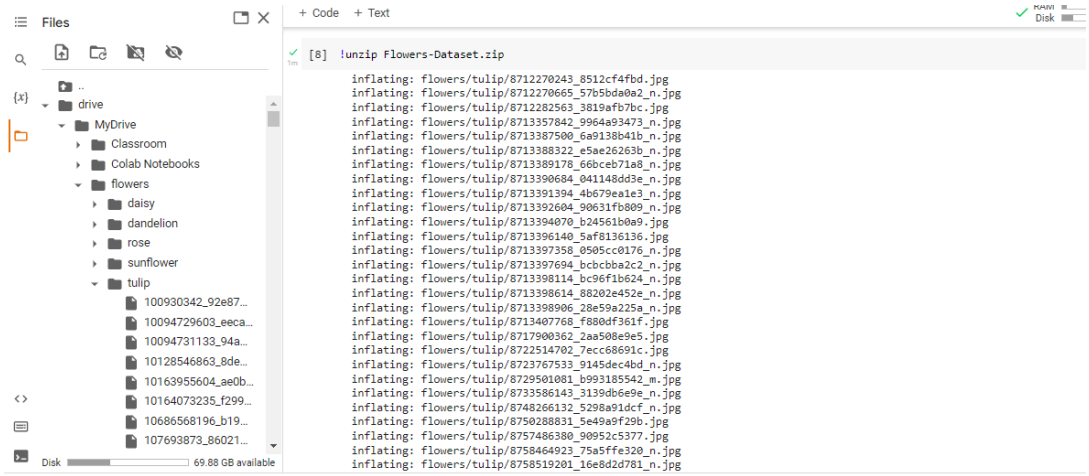




3.Create Model

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:

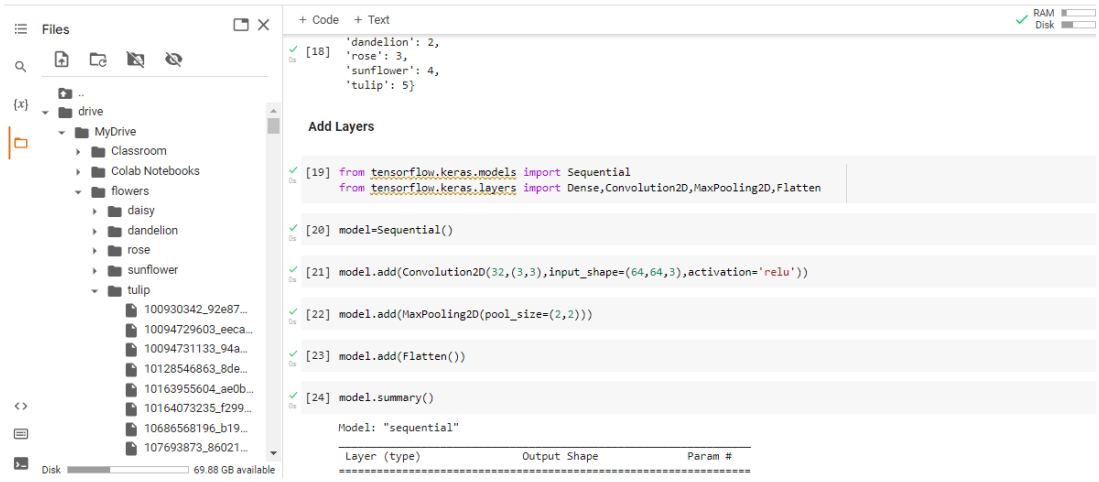
```
from tensorflow.keras.models import Sequential
from tensorflow.keras.layers import Dense,Convolution2D,MaxPooling2D,Flatten
model=Sequential()
model.add(Convolution2D(32,(3,3),input_shape=(64,64,3),activation='relu'))
model.add(MaxPooling2D(pool_size=(2,2)))
model.add(Flatten())
model.summary()
32*(3*3*3+1)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

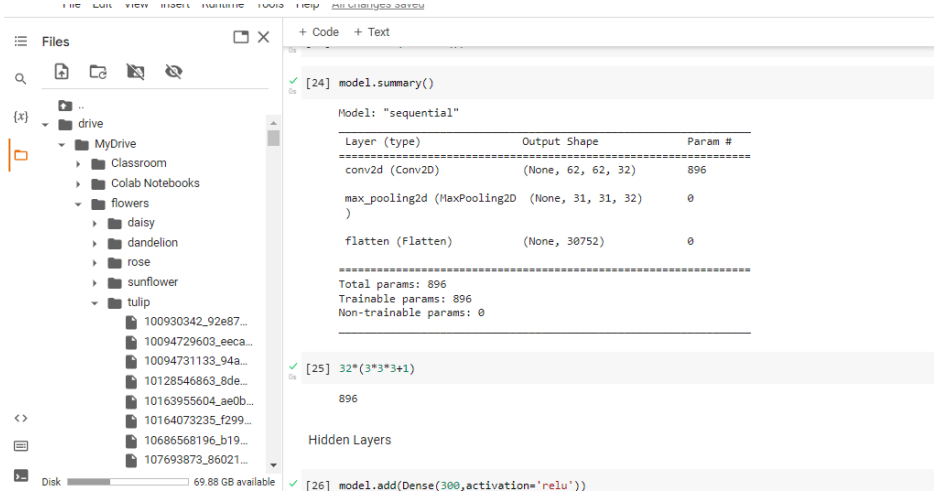
Hidden layer

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

Output layer

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

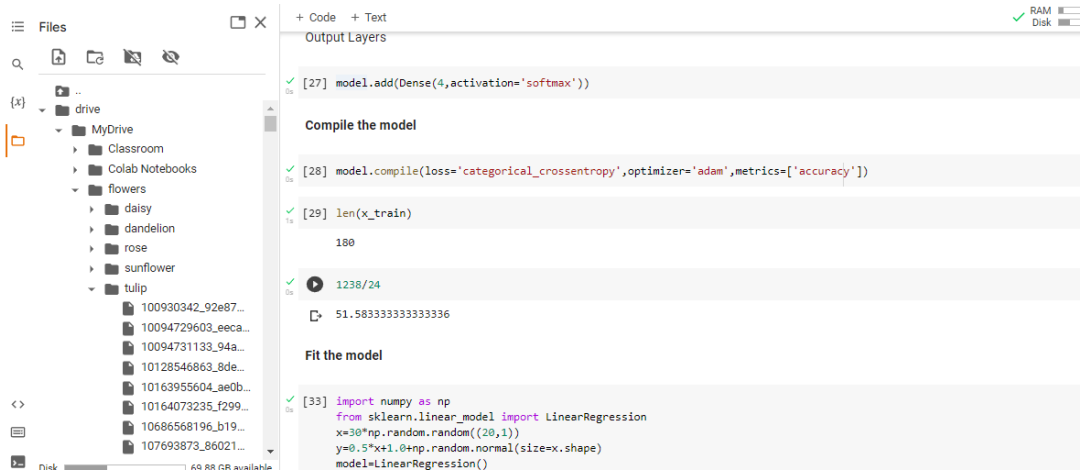




5.Compile The Model

Solution:

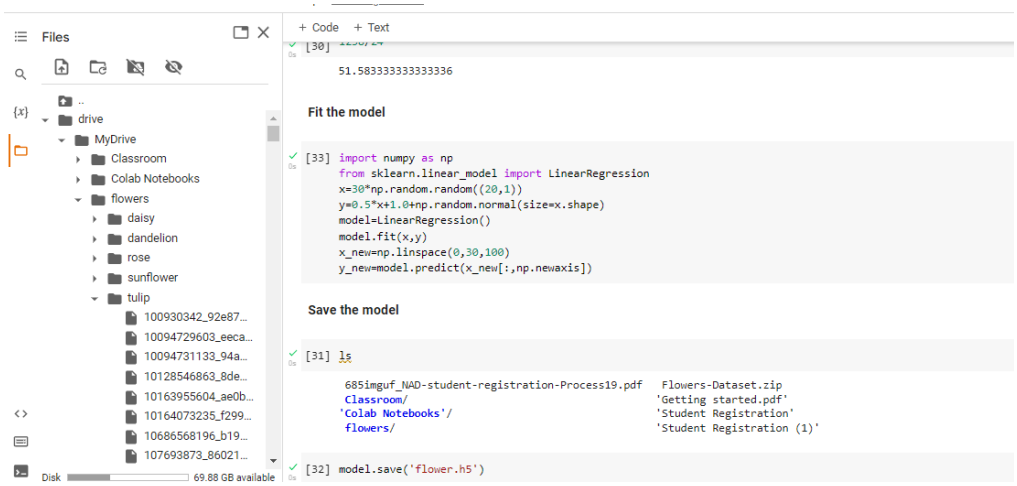
```
model.compile(loss='categorical_crossentropy',optimizer='adam',metrics=['accuracy'])
len(x_train)
1238/24
```



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
arget_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)
```

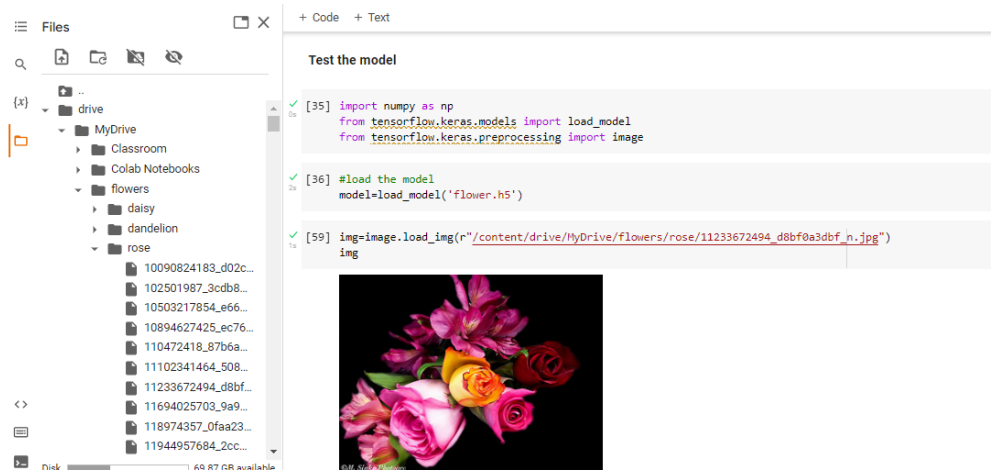
```
index=['daisy','dandelion','rose','sunflower','tulip']
index[y[0]]
```

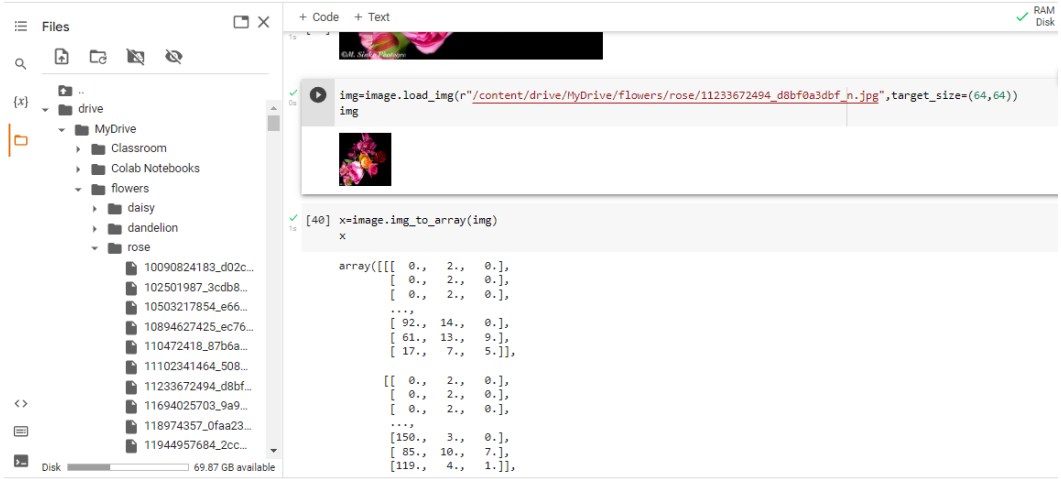
```
img=image.load_img(r"/content/drive/MyDrive/flowers/dandelion/10043234166_e6dd915111_n
.jpg",target_size=(64,64))
x=image.img_to_array(img)
x=np.expand_dims(x,axis=0)
y=np.argmax(model.predict(x),axis=1)
index=['daisy','dandelion','rose','sunflower','tulip']
index[y[0]]
```

```
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
+ Code + Text
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')
[59] img=image.load_img(r"/content/drive/MyDrive/flowers/rose/11233672494_d8bf0a3dbf_n.jpg")
img
drive
MyDrive
Classroom
Colab Notebooks
flowers
daisy
dandelion
rose
Disk
69.87 GB available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img=image.load_img(r"/content/drive/MyDrive/flowers/rose/11233672494_d8bf0a3dbf_n.jpg",target_size=(64,64))
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.]],
drive
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Colab Notebooks
flowers
daisy
dandelion
rose
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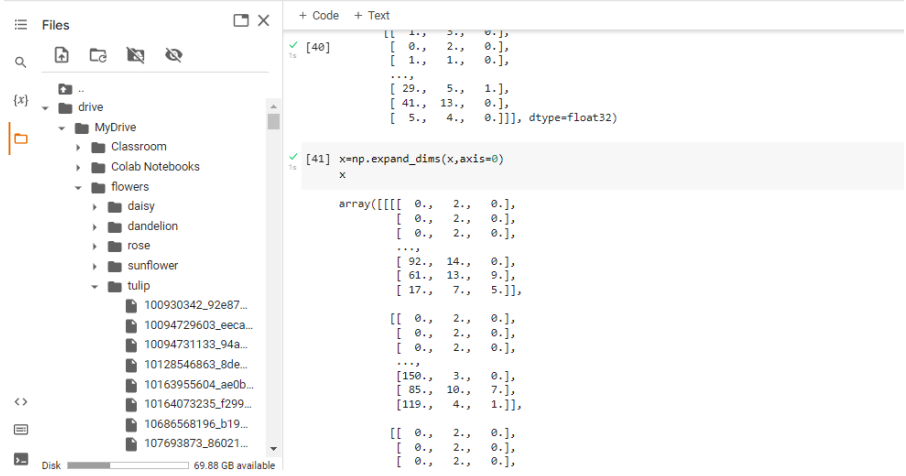
Files
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[40] [[0., 2., 0.],
[1., 1., 0.],
...,
[29., 5., 1.],
[41., 13., 0.],
[5., 4., 0.]]], dtype=float32)
[41] x=np.expand_dims(x,axis=0)
x
array([[[[0., 2., 0.],
[0., 2., 0.],
[0., 2., 0.],
...,
[92., 14., 0.],
[61., 13., 9.],
[17., 7., 5.]],
[[0., 2., 0.],
[0., 2., 0.],
[0., 2., 0.],
...,
[150., 3., 0.],
[85., 10., 7.],
[119., 4., 1.]],
[[0., 2., 0.],
[0., 2., 0.],
[0., 2., 0.],
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flowers
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rose
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tulip
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tulip
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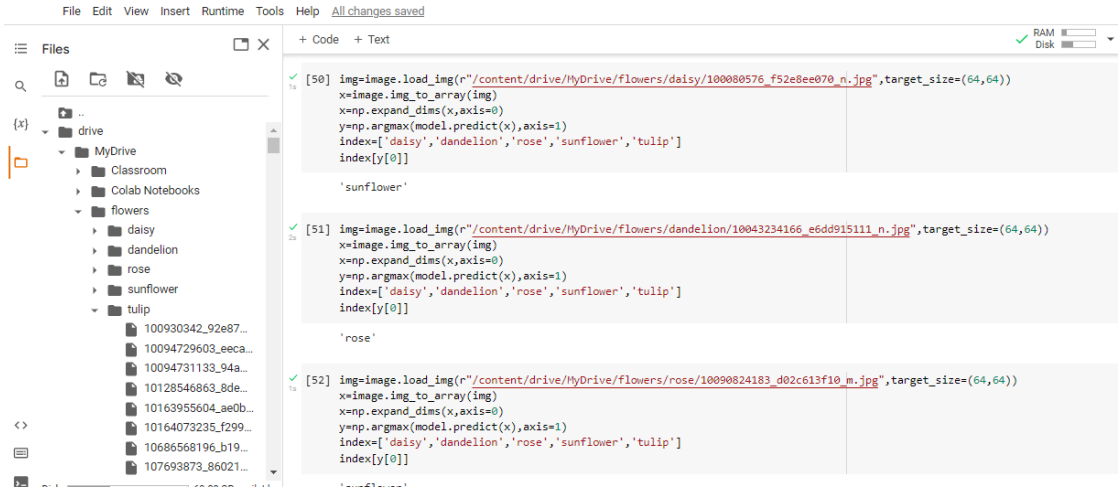
Disk
[41] [41., 13., 0.],
[5., 4., 0.]]], dtype=float32)
[42] y=np.argmax(model.predict(x),axis=1)
y
array([3])
[43] x_train.class_indices
{'.ipynb_checkpoints': 0,
'daisy': 1,
'dandelion': 2,
'rose': 3,
'sunflower': 4,
'tulip': 5}
[44] index=['daisy','dandelion','rose','sunflower','tulip']
[46] index[y[0]]
'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)


File Edit View Insert Runtime Tools Help All changes saved
Files
drive
MyDrive
Classroom
Colab Notebooks
flowers
daisy
dandelion
rose
sunflower
tulip
+ Code + Text
RAM
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[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]]


Files
drive
MyDrive
Classroom
Colab Notebooks
flowers
daisy
dandelion
rose
sunflower
tulip
Disk 69.88 GB available
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RAM
Disk
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'