

▼ 1.Download the Dataset

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

Mounted at /content/drive

```
!unzip '/content/drive/MyDrive/Flowers-Dataset.zip'
```

```
inflating: flowers/tulip/8712270243_8512c4t4bd.jpg
inflating: flowers/tulip/8712270665_57b5bda0a2_n.jpg
inflating: flowers/tulip/8712282563_3819afb7bc.jpg
inflating: flowers/tulip/8713357842_9964a93473_n.jpg
inflating: flowers/tulip/8713387500_6a9138b41b_n.jpg
inflating: flowers/tulip/8713388322_e5ae26263b_n.jpg
inflating: flowers/tulip/8713389178_66bceb71a8_n.jpg
inflating: flowers/tulip/8713390684_041148dd3e_n.jpg
inflating: flowers/tulip/8713391394_4b679ea1e3_n.jpg
inflating: flowers/tulip/8713392604_90631fb809_n.jpg
inflating: flowers/tulip/8713394070_b24561b0a9.jpg
inflating: flowers/tulip/8713396140_5af8136136.jpg
```

Automatic saving failed. This file was updated remotely or in another tab.

[Show](#)

[diff](#)

```
inflating: flowers/tulip/8713398614_88202e452e_n.jpg
inflating: flowers/tulip/8713398906_28e59a225a_n.jpg
inflating: flowers/tulip/8713407768_f880df361f.jpg
inflating: flowers/tulip/8717900362_2aa508e9e5.jpg
inflating: flowers/tulip/8722514702_7ecc68691c.jpg
inflating: flowers/tulip/8723767533_9145dec4bd_n.jpg
inflating: flowers/tulip/8729501081_b993185542_m.jpg
inflating: flowers/tulip/8733586143_3139db6e9e_n.jpg
inflating: flowers/tulip/8748266132_5298a91dcf_n.jpg
inflating: flowers/tulip/8750288831_5e49a9f29b.jpg
inflating: flowers/tulip/8757486380_90952c5377.jpg
inflating: flowers/tulip/8758464923_75a5ffe320_n.jpg
inflating: flowers/tulip/8758519201_16e8d2d781_n.jpg
inflating: flowers/tulip/8759594528_2534c0ec65_n.jpg
inflating: flowers/tulip/8759597778_7fca5d434b_n.jpg
inflating: flowers/tulip/8759601388_36e2a50d98_n.jpg
inflating: flowers/tulip/8759606166_8e475013fa_n.jpg
inflating: flowers/tulip/8759618746_f5e39fdbf8_n.jpg
inflating: flowers/tulip/8762189906_8223cef62f.jpg
inflating: flowers/tulip/8762193202_0fbf2f6a81.jpg
inflating: flowers/tulip/8768645961_8f1e097170_n.jpg
inflating: flowers/tulip/8817622133_a42bb90e38_n.jpg
inflating: flowers/tulip/8838347159_746d14e6c1_m.jpg
inflating: flowers/tulip/8838354855_c474fc66a3_m.jpg
inflating: flowers/tulip/8838914676_8ef4db7f50_n.jpg
inflating: flowers/tulip/8838975946_f54194894e_m.jpg
inflating: flowers/tulip/8838983024_5c1a767878_n.jpg
inflating: flowers/tulip/8892851067_79242a7362_n.jpg
inflating: flowers/tulip/8904780994_8867d64155_n.jpg
inflating: flowers/tulip/8908062479_449200a1b4.jpg
inflating: flowers/tulip/8908097235_c3e746d36e_n.jpg
```

```
inflating: flowers/tulip/9019694597_2d3bbbedb17.jpg
inflating: flowers/tulip/9030467406_05e93ff171_n.jpg
inflating: flowers/tulip/9048307967_40a164a459_m.jpg
inflating: flowers/tulip/924782410_94ed7913ca_m.jpg
inflating: flowers/tulip/9378657435_89fabf13c9_n.jpg
inflating: flowers/tulip/9444202147_405290415b_n.jpg
inflating: flowers/tulip/9446982168_06c4d71da3_n.jpg
inflating: flowers/tulip/9831362123_5aac525a99_n.jpg
inflating: flowers/tulip/9870557734_88eb3b9e3b_n.jpg
inflating: flowers/tulip/9947374414_fdf1d0861c_n.jpg
inflating: flowers/tulip/9947385346_3a8cacea02_n.jpg
inflating: flowers/tulip/9976515506_d496c5e72c.jpg
```

▼ 2. Image Augmentation

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

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

Automatic saving failed. This file was updated remotely or in another tab. [Show diff](#)

```
xtrain = train_datagen.flow_from_directory('/content/flowers',
                                           target_size=(64,64),
                                           class_mode='categorical',
                                           batch_size=100)
```

Found 4317 images belonging to 5 classes.

▼ 3. Create Model

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

▼ 4. Add Layers

```
model = Sequential()
model.add(Convolution2D(32, (3,3), activation='relu', input_shape=(64,64,3))) # Convolution 1
model.add(MaxPooling2D(pool_size=(2,2)))
model.add(Flatten())
model.add(Dense(300, activation='relu'))
model.add(Dense(150, activation='relu'))
model.add(Dense(5, activation='softmax')) #Output
```

▼ 5.Compile the Model

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

▼ 6.Fit the Model

```
model.fit(xtrain,
          steps_per_epoch=len(xtrain),
          epochs=10,
          )
```

Epoch 1/10

44/44 [=====] - 22s 324ms/step - loss: 1.6350 - accuracy: 0

Epoch 2/10

44/44 [=====] - 14s 326ms/step - loss: 1.1413 - accuracy: 0

Epoch 3/10

44/44 [=====] - 15s 338ms/step - loss: 1.0069 - accuracy: 0

Epoch 4/10

- accuracy: 0

Automatic saving failed. This file was updated remotely or in another tab. [Show](#)

[diff](#)

- accuracy: 0

Epoch 6/10

44/44 [=====] - 14s 325ms/step - loss: 0.8332 - accuracy: 0

Epoch 7/10

44/44 [=====] - 15s 344ms/step - loss: 0.7997 - accuracy: 0

Epoch 8/10

44/44 [=====] - 16s 368ms/step - loss: 0.7642 - accuracy: 0

Epoch 9/10

44/44 [=====] - 15s 332ms/step - loss: 0.7476 - accuracy: 0

Epoch 10/10

44/44 [=====] - 15s 344ms/step - loss: 0.6924 - accuracy: 0

<keras.callbacks.History at 0x7fcc47801e50>

▼ 7.Save the Model

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

▼ 8.Test the Model

```
import numpy as np
from tensorflow.keras.preprocessing import image
```

```
img = image.load_img('/content/flowers/sunflower/1008566138_6927679c8a.jpg',target_size=(64,64))
img
```



```
x = image.img_to_array(img)
x
x = np.expand_dims(x,axis=0)
x
model.predict(x)

1/1 [=====] - 0s 123ms/step
array([[0., 0., 0., 1., 0.]], dtype=float32)
```

```
xtrain.class_indices
```

```
{'daisy': 0, 'dandelion': 1, 'rose': 2, 'sunflower': 3, 'tulip': 4}
```

```
op = ['daisy','dandelion','rose','sunflower','tulip']
pred = np.argmax(model.predict(x))
op[pred]
```

Automatic saving failed. This file was updated remotely or in another tab. [Show](#)

diff

```
'sunflower'
```

▼ Test Individual

Test 1

```
from numpy.lib.type_check import imag
img = image.load_img('/content/flowers/tulip/10128546863_8de70c610d.jpg',target_size=(64,64))
img
```



```
x = image.img_to_array(img)
x = np.expand_dims(x,axis=0)
pred = np.argmax(model.predict(x))
op[pred]

1/1 [=====] - 0s 17ms/step
'tulip'
```

Test 2

```
img = image.load_img('/content/flowers/rose/102501987_3cdb8e5394_n.jpg',target_size=(64,64)
img
```



```
x = image.img_to_array(img)
x = np.expand_dims(x,axis=0)
pred = np.argmax(model.predict(x))
op[pred]

1/1 [=====] - 0s 15ms/step
'rose'
```

Test 3

```
img = image.load_img('/content/flowers/daisy/10172567486_2748826a8b.jpg',target_size=(64,64)
img
```

Automatic saving failed. This file was updated remotely or in another tab. [Show diff](#)



```
x = image.img_to_array(img)
x = np.expand_dims(x,axis=0)
pred = np.argmax(model.predict(x))
op[pred]

1/1 [=====] - 0s 15ms/step
'daisy'
```

Test 4

```
img = image.load_img('/content/flowers/dandelion/11405573_24a8a838cc_n.jpg',target_size=(64,64)
img
```



```
x = image.img_to_array(img)
x = np.expand_dims(x,axis=0)
pred = np.argmax(model.predict(x))
op[pred]
```

```
1/1 [=====] - 0s 14ms/step  
'dandelion'
```

[Colab paid products](#) - [Cancel contracts here](#)

Automatic saving failed. This file was updated remotely or in another tab. [Show diff](#)

