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

     Mounted at /content/drive
```

```
cd /content/drive/MyDrive/CNN

     /content/drive/MyDrive/CNN
```

```
!unzip Flowers-Dataset.zip

     Archive:  Flowers-Dataset.zip
       inflating: flowers/daisy/100080576_f52e8ee070_n.jpg
       inflating: flowers/daisy/10140303196_b88d3d6cec.jpg
       inflating: flowers/daisy/10172379554_b296050f82_n.jpg
       inflating: flowers/daisy/10172567486_2748826a8b.jpg
       inflating: flowers/daisy/10172636503_21bededa75_n.jpg
       inflating: flowers/daisy/102841525_bd6628ae3c.jpg
       inflating: flowers/daisy/10300722094_28fa978807_n.jpg
       inflating: flowers/daisy/1031799732_e7f4008c03.jpg
       inflating: flowers/daisy/10391248763_1d16681106_n.jpg
       inflating: flowers/daisy/10437754174_22ec990b77_m.jpg
       inflating: flowers/daisy/10437770546_8bb6f7bdd3_m.jpg
       inflating: flowers/daisy/10437929963_bc13eebe0c.jpg
       inflating: flowers/daisy/10466290366_cc72e33532.jpg
       inflating: flowers/daisy/10466558316_a7198b87e2.jpg
       inflating: flowers/daisy/10555749515_13a12a026e.jpg
       inflating: flowers/daisy/10555815624_dc211569b0.jpg
       inflating: flowers/daisy/10555826524_423eb8bf71_n.jpg
       inflating: flowers/daisy/10559679065_50d2b16f6d.jpg
       inflating: flowers/daisy/105806915_a9c13e2106_n.jpg
       inflating: flowers/daisy/10712722853_5632165b04.jpg
       inflating: flowers/daisy/107592979_aaa9cdfe78_m.jpg
       inflating: flowers/daisy/10770585085_4742b9dac3_n.jpg
       inflating: flowers/daisy/10841136265_af473efc60.jpg
       inflating: flowers/daisy/10993710036_2033222c91.jpg
       inflating: flowers/daisy/10993818044_4c19b86c82.jpg
       inflating: flowers/daisy/10994032453_ac7f8d9e2e.jpg
       inflating: flowers/daisy/11023214096_b5b39fab08.jpg
       inflating: flowers/daisy/11023272144_fce94401f2_m.jpg
       inflating: flowers/daisy/11023277956_8980d53169_m.jpg
       inflating: flowers/daisy/11124324295_503f3a0804.jpg
       inflating: flowers/daisy/1140299375_3aa7024466.jpg
       inflating: flowers/daisy/11439894966_dca877f0cd.jpg
       inflating: flowers/daisy/1150395827_6f94a5c6e4_n.jpg
       inflating: flowers/daisy/11642632_1e7627a2cc.jpg
       inflating: flowers/daisy/11834945233_a53b7a92ac_m.jpg
       inflating: flowers/daisy/11870378973_2ec1919f12.jpg
       inflating: flowers/daisy/11891885265_ccefec7284_n.jpg
       inflating: flowers/daisy/12193032636_b50ae7db35_n.jpg
       inflating: flowers/daisy/12348343085_d4c396e5b5_m.jpg
       inflating: flowers/daisy/12585131704_0f64b17059_m.jpg
       inflating: flowers/daisy/12601254324_3cb62c254a_m.jpg
       inflating: flowers/daisy/1265350143_6e2b276ec9.jpg
       inflating: flowers/daisy/12701063955_4840594ea6_n.jpg
       inflating: flowers/daisy/1285423653_18926dc2c8_n.jpg
```

```
      inflating: flowers/daisy/1286274236_1d7ac84efb_n.jpg
      inflating: flowers/daisy/12891819633_e4c82b51e8.jpg
      inflating: flowers/daisy/1299501272_59d9da5510_n.jpg
      inflating: flowers/daisy/1306119996_ab8ae14d72_n.jpg
      inflating: flowers/daisy/1314069875_da8dc023c6_m.jpg
      inflating: flowers/daisy/1342002397_9503c97b49.jpg
      inflating: flowers/daisy/134409839_71069a95d1_m.jpg
      inflating: flowers/daisy/1344985627_c3115e2d71_n.jpg
      inflating: flowers/daisy/13491959645_2cd9df44d6_n.jpg
      inflating: flowers/daisy/1354396826_2868631432_m.jpg
      inflating: flowers/daisy/1355787476_32e9f2a30b.jpg
      inflating: flowers/daisy/13583238844_573df2de8e_m.jpg
      inflating: flowers/daisy/1374193928 a52320eafa.jpg
```

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

```
train_data = ImageDataGenerator(rescale= 1./255,horizontal_flip = True,vertical_flip = Tru
```

```
test_data = ImageDataGenerator(rescale= 1./255)
```

```
x_train = train_data.flow_from_directory(r'/content/drive/MyDrive/CNN/flowers_dataset/Trai
```

```
     Found 3450 images belonging to 5 classes.
```

```
x_test = test_data.flow_from_directory(r"/content/drive/MyDrive/CNN/flowers_dataset/Testin
```

```
     Found 867 images belonging to 5 classes.
```

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

```
my_model = Sequential()
```

Saving... ×

```
my_model.add(Convolution2D(32,(3,3),activation = "relu",input_shape = (64,64,3)))
```

```
my_model.add(MaxPooling2D(pool_size = (2,2)))
```

```
my_model.add(Flatten())
```

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

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

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

```
my_model.add(Dense(5, activation="softmax"))
my_model.compile(loss="categorical_crossentropy", metrics=["accuracy"], optimizer='adam')
```

```
my_model.fit(x_train, epochs = 10, validation_data=x_test, steps_per_epoch=len(x_train), v
```

```
Epoch 1/10
133/133 [==============================] - 42s 316ms/step - loss: 0.7164 - accuracy:
Epoch 2/10
133/133 [==============================] - 40s 298ms/step - loss: 0.6944 - accuracy:
Epoch 3/10
133/133 [==============================] - 40s 297ms/step - loss: 0.6963 - accuracy:
Epoch 4/10
133/133 [==============================] - 39s 294ms/step - loss: 0.6560 - accuracy:
Epoch 5/10
133/133 [==============================] - 41s 309ms/step - loss: 0.6434 - accuracy:
Epoch 6/10
133/133 [==============================] - 39s 294ms/step - loss: 0.6037 - accuracy:
Epoch 7/10
133/133 [==============================] - 39s 295ms/step - loss: 0.5737 - accuracy:
Epoch 8/10
133/133 [==============================] - 41s 308ms/step - loss: 0.5418 - accuracy:
Epoch 9/10
133/133 [==============================] - 39s 295ms/step - loss: 0.5328 - accuracy:
Epoch 10/10
133/133 [==============================] - 40s 297ms/step - loss: 0.4957 - accuracy:
<keras.callbacks.History at 0x7fed539646d0>
```

```
my_model.fit(x_train, epochs = 10, validation_data=x_test, steps_per_epoch=len(x_train), v
```

```
Epoch 1/10
133/133 [==============================] - 42s 316ms/step - loss: 0.4991 - accuracy:
Epoch 2/10
133/133 [==============================] - 41s 306ms/step - loss: 0.4708 - accuracy:
Epoch 3/10
133/133 [==============================] - 39s 293ms/step - loss: 0.4629 - accuracy:
Epoch 4/10
133/133 [==============================] - 39s 294ms/step - loss: 0.4459 - accuracy:
Epoch 5/10
133/133 [==============================] - 39s 294ms/step - loss: 0.4510 - accuracy:
Epoch 6/10
133/133 [==============================] - 41s 306ms/step - loss: 0.4171 - accuracy:
Epoch 7/10
133/133 [==============================] - 39s 294ms/step - loss: 0.3759 - accuracy:
Epoch 8/10
133/133 [==============================] - 39s 296ms/step - loss: 0.3821 - accuracy:
Epoch 9/10
133/133 [==============================] - 40s 297ms/step - loss: 0.3501 - accuracy:
Epoch 10/10
133/133 [==============================] - 42s 314ms/step - loss: 0.3427 - accuracy:
<keras.callbacks.History at 0x7fed5392a7d0>
```

```
my_model.fit(x_train, epochs = 10, validation_data=x_test, steps_per_epoch=len(x_train), v
```

```
Epoch 1/10
133/133 [==============================] - 40s 297ms/step - loss: 0.3205 - accuracy:
```

```
Epoch 2/10
133/133 [==============================] - 41s 308ms/step - loss: 0.3309 - accuracy:
Epoch 3/10
133/133 [==============================] - 40s 300ms/step - loss: 0.3483 - accuracy:
Epoch 4/10
133/133 [==============================] - 40s 301ms/step - loss: 0.2861 - accuracy:
Epoch 5/10
133/133 [==============================] - 42s 315ms/step - loss: 0.2925 - accuracy:
Epoch 6/10
133/133 [==============================] - 40s 301ms/step - loss: 0.2820 - accuracy:
Epoch 7/10
133/133 [==============================] - 40s 296ms/step - loss: 0.2935 - accuracy:
Epoch 8/10
133/133 [==============================] - 40s 297ms/step - loss: 0.2522 - accuracy:
Epoch 9/10
133/133 [==============================] - 41s 309ms/step - loss: 0.2682 - accuracy:
Epoch 10/10
133/133 [==============================] - 40s 300ms/step - loss: 0.2424 - accuracy:
<keras.callbacks.History at 0x7fed538e53d0>
```

```
my_model.fit(x_train, epochs = 6, validation_data=x_test, steps_per_epoch=len(x_train), va
```

```
Epoch 1/6
133/133 [==============================] - 42s 319ms/step - loss: 0.2394 - accuracy:
Epoch 2/6
133/133 [==============================] - 40s 298ms/step - loss: 0.2613 - accuracy:
Epoch 3/6
133/133 [==============================] - 39s 295ms/step - loss: 0.2261 - accuracy:
Epoch 4/6
133/133 [==============================] - 40s 297ms/step - loss: 0.1953 - accuracy:
Epoch 5/6
133/133 [==============================] - 41s 308ms/step - loss: 0.2163 - accuracy:
Epoch 6/6
133/133 [==============================] - 39s 296ms/step - loss: 0.2151 - accuracy:
<keras.callbacks.History at 0x7fed538a4350>
```

Saving...

```
my_model.save('flowers_prediction.h5')
```

Testing

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

```
model = load_model('flowers_prediction.h5')
```

```
photo = image.load_img("/content/drive/MyDrive/CNN/flowers_dataset/Training/tulip/13530786
```

```
photo
```

```
img= image.img_to_array(photo)
```

```
img = np.expand_dims(img,axis = 0)
```

```
pred = model.predict(img)
```

```
    1/1 [==============================] - 0s 137ms/step
```

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

```
np.argmax(pred)
labels[np.argmax(pred)]
```

```
    'tulip'
```

Saving...