917719IT052-Madhavan R

Assignment-3

1.DOWNLOAD THE DATA SET

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

```
  inflating: flowers/tulip/21091489585_0dcb89e65e_n.jpg
  inflating: flowers/tulip/21091503556_8b46da140e_n.jpg
  inflating: flowers/tulip/212720516_df4965ebda_n.jpg
  inflating: flowers/tulip/2220085701_896054d263_n.jpg
  inflating: flowers/tulip/2229804138_db9cba3443_n.jpg
  inflating: flowers/tulip/2232289392_9a79a0c5cb_n.jpg
  inflating: flowers/tulip/2243427551_809b603992_z.jpg
  inflating: flowers/tulip/2249756775_02e693beda_n.jpg
  inflating: flowers/tulip/2254152047_d3bf8903cd_n.jpg
  inflating: flowers/tulip/2256214682_130c01d9d9.jpg
  inflating: flowers/tulip/2256230386_08b54ca760.jpg
  inflating: flowers/tulip/2271507463_15c48d41c4_n.jpg
  inflating: flowers/tulip/2272006181_785f1be94f_n.jpg
  inflating: flowers/tulip/2280950463_86510c2789_n.jpg
  inflating: flowers/tulip/2294116183_a30d2aa2c1_m.jpg
  inflating: flowers/tulip/2322670828_34115a7050.jpg
  inflating: flowers/tulip/2333321040_3960b9d67e_n.jpg
  inflating: flowers/tulip/2336919121_851ebc4754.jpg
  inflating: flowers/tulip/2344751399_71620039f2_n.jpg
  inflating: flowers/tulip/2351637471_5dd34fd3ac_n.jpg
  inflating: flowers/tulip/2361075034_cf730b8682.jpg
  inflating: flowers/tulip/2374855021_21959b40c0_n.jpg
  inflating: flowers/tulip/2399982682_16929d1f6d_n.jpg
  inflating: flowers/tulip/2402342888_dd65677013.jpg
  inflating: flowers/tulip/2412250315_a04171da51_n.jpg
  inflating: flowers/tulip/2418823693_72eec80f42_n.jpg
  inflating: flowers/tulip/2421740440_f82ced8582.jpg
  inflating: flowers/tulip/2425067141_b27043a800_m.jpg
  inflating: flowers/tulip/2426847695_4b8409402e_n.jpg
  inflating: flowers/tulip/2426849837_baefd9a518_n.jpg
  inflating: flowers/tulip/2427626706_ffdf697f84_n.jpg
  inflating: flowers/tulip/2430566689_8543552f9b.jpg
  inflating: flowers/tulip/2431737309_1468526f8b.jpg
  inflating: flowers/tulip/2432389721_4d14971060_n.jpg
  inflating: flowers/tulip/2434178332_7fcf85aa95_n.jpg
  inflating: flowers/tulip/2436998042_4906ea07af.jpg
  inflating: flowers/tulip/2440874162_27a7030402_n.jpg
  inflating: flowers/tulip/2447151631_7551e6377b_n.jpg
  inflating: flowers/tulip/2489638840_72ff3ee527_n.jpg
  inflating: flowers/tulip/2503489175_f0848d3e8e.jpg
  inflating: flowers/tulip/251811158_75fa3034ff.jpg
  inflating: flowers/tulip/2535936698_78cc03df3f_n.jpg
  inflating: flowers/tulip/25429468133_6bfba75d94_n.jpg
  inflating: flowers/tulip/25429501953_a1f9ce09e6_n.jpg
  inflating: flowers/tulip/25759191500_1c0da35828_n.jpg
  inflating: flowers/tulip/25965526231_941b6a216d_n.jpg
```

```
inflating: flowers/tulip/25965548411_dbbe26262b_n.jpg
inflating: flowers/tulip/26564770956_ac4800ae85_n.jpg
inflating: flowers/tulip/26685647236_8211cb3e95_n.jpg
inflating: flowers/tulip/26685648806_c76dd583b9_n.jpg
inflating: flowers/tulip/2785458179_9130812eef_m.jpg
inflating: flowers/tulip/2813649953_2b0f20fe94_n.jpg
inflating: flowers/tulip/2834890466_1cf220fba1.jpg
inflating: flowers/tulip/2936181186_38ff43492e.jpg
inflating: flowers/tulip/3002863623_cd83d6e634.jpg
inflating: flowers/tulip/3011223301_09b4e3edb7.jpg
inflating: flowers/tulip/303858799_942b9c09e7_m.jpg
inflating: flowers/tulip/3143110904_66b4851a58_n.jpg
```

2.IMAGE AUGMENTATION

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

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

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

```
xtrain=train_datagen.flow_from_directory('/content/flowers',
                                         target_size=(76,76),
                                         class_mode='categorical',
                                         batch_size=100)
```

```
Found 4317 images belonging to 5 classes.
```

```
xtest=test_datagen.flow_from_directory('/content/flowers',
                                        target_size=(76,76),
                                        class_mode='categorical',
                                        batch_size=100)
```

```
Found 4317 images belonging to 5 classes.
```

3.CREAT MODEL

```
from tensorflow.keras.models import Sequential
```

```
from tensorflow.keras.layers import Convolution2D,MaxPool2D,Flatten,Dense
```

4.ADD LAYERS

```
model=Sequential()
model.add(Convolution2D(32,(3,3),activation='relu',input_shape=(76,76,3)))
model.add(MaxPool2D(pool_size=(2,2)))
```

```
model.add(Flatten())
model.add(Dense(300,activation='relu'))
model.add(Dense(150,activation='relu'))
model.add(Dense(4,activation='softmax'))
```

5.COMPILE THE MODEL

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

6.FIT THE MODEL

```
model.fit_generator(xtrain,
                    steps_per_epoch= len (xtrain),
                    epochs= 10,
                    validation_data=xtest,
                    validation_steps= len (xtest))
```

7. SAVE THE MODEL

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

8.TESTING THE MODEL

testing 1

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

img=image.load_img('/content/flowers/daisy/10140303196_b88d3d6cec.jpg',target_size=(76,76)
img
```

```
x=image.img_to_array(img)
x
x=np.expand_dims(x,axis=0)
pred=np.argmax(model.predict(x))
pred
op=['daisy','dandelion','rose','sunflower','tulip']
op[pred]
```

```
'daisy'
```

testing 2

```
img=image.load_img('/content/flowers/rose/10503217854_e66a804309.jpg',target_size=(76,76))
img
```

```
x=image.img_to_array(img)
x
x=np.expand_dims(x,axis=0)
pred=np.argmax(model.predict(x))
pred
op=['daisy','dandelion','rose','sunflower','tulip']
op[pred]
```

```
'daisy'
```

testing 3

```
img=image.load_img('/content/flowers/sunflower/1022552002_2b93faf9e7_n.jpg',target_size=(7
img
```

```
x=image.img_to_array(img)
x
x=np.expand_dims(x,axis=0)
pred=np.argmax(model.predict(x))
pred
op=['daisy','dandelion','rose','sunflower','tulip']
op[pred]
```

```
'daisy'
```

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