Assignment -3
Build CNN Model for Classification Of Flowers

Assignment Date	06 October 2022
Student Name	Gunupudi Venkata Lakshmi Durga Sunaina
Student Roll Number	113219041033
Maximum Marks	2 Marks

1.Download the Dataset : Dataset

Dataset downloaded and uploaded

2.Image Augmentation

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

daisy_datagen=ImageDataGenerator(rescale=1./255,zoom_range=0.5,horizontal_flip=True,vertical_flip=True)


x_data= daisy_datagen.flow_from_directory(r"/content/drive/MyDrive/flowers/daisy",target_size=(64,64),class_mode="categorical",batch_size=24)

x_data.class_indices
```

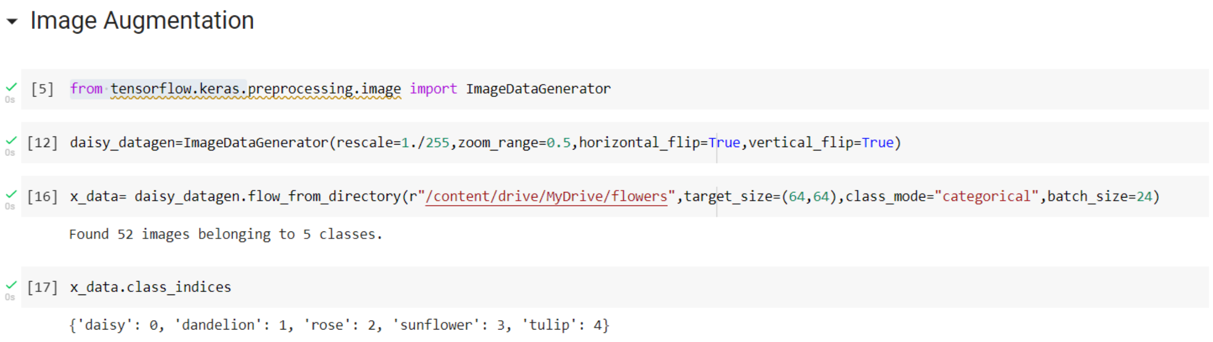
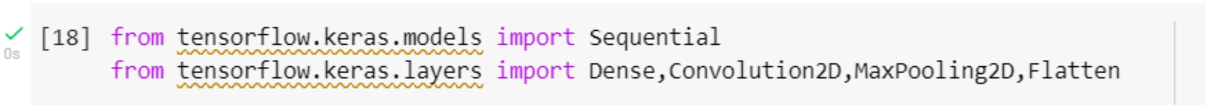


Image Augmentation

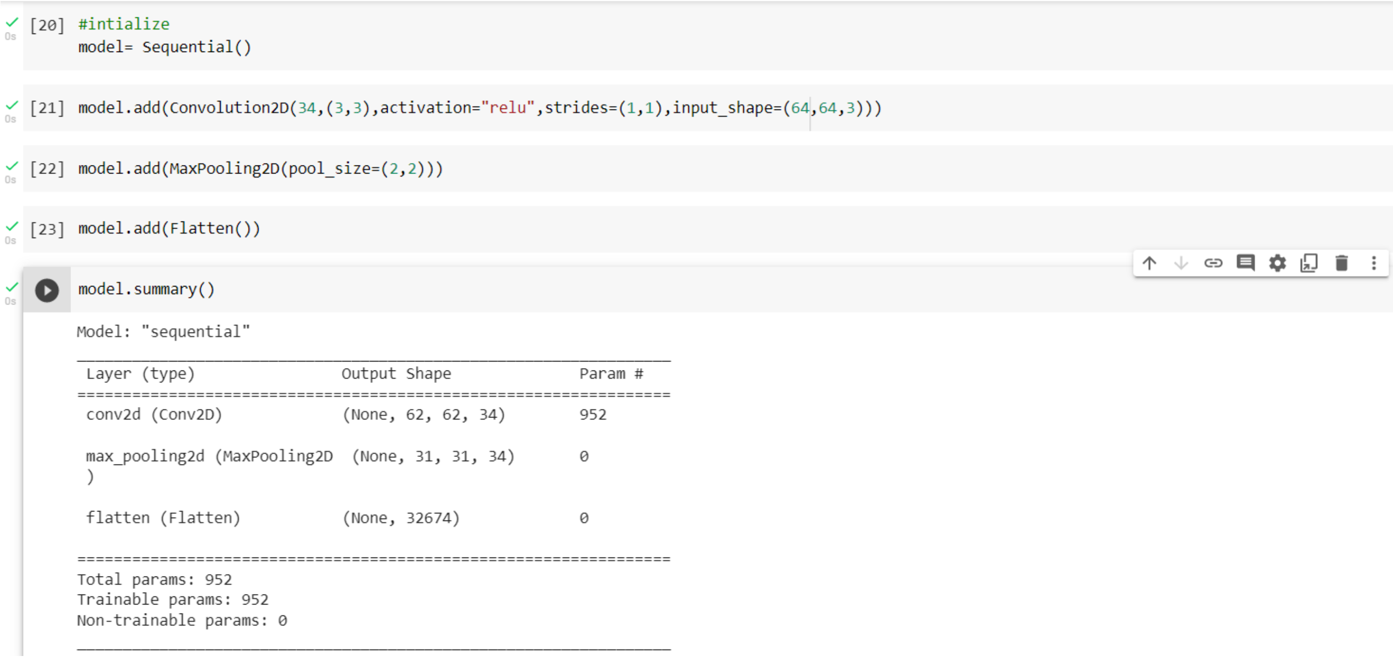
```
[5] from tensorflow.keras.preprocessing.image import ImageDataGenerator

[12] daisy_datagen=ImageDataGenerator(rescale=1./255,zoom_range=0.5,horizontal_flip=True,vertical_flip=True)

[16] x_data= daisy_datagen.flow_from_directory(r"/content/drive/MyDrive/flowers",target_size=(64,64),class_mode="categorical",batch_size=24)

     Found 52 images belonging to 5 classes.

[17] x_data.class_indices

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

3. Create Model



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

4.Add Layers (Convolution,MaxPooling,Flatten,Dense-(Hidden Layers),Output)



```
[20] #intialize
     model= Sequential()
```

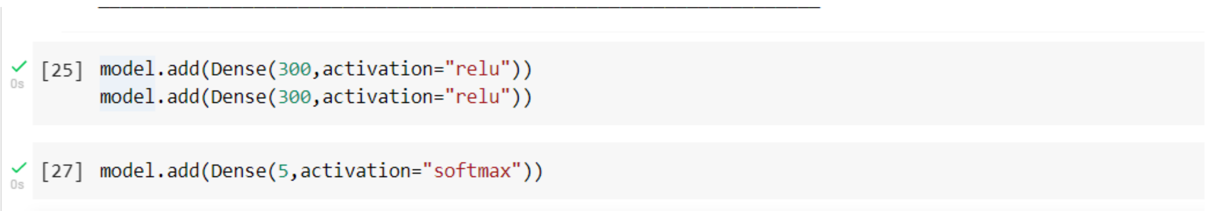
```
[21] model.add(Convolution2D(34,(3,3),activation="relu",strides=(1,1),input_shape=(64,64,3)))
```

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

```
[23] model.add(Flatten())
```

```
model.summary()
```

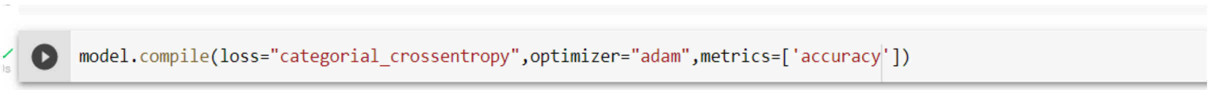
```
Model: "sequential"
_________________________________________________________________
 Layer (type)                Output Shape              Param #
=================================================================
 conv2d (Conv2D)             (None, 62, 62, 34)        952

 max_pooling2d (MaxPooling2D  (None, 31, 31, 34)       0
 )

 flatten (Flatten)           (None, 32674)             0

=================================================================
Total params: 952
Trainable params: 952
Non-trainable params: 0
_________________________________________________________________
```



```
[25] model.add(Dense(300,activation="relu"))
     model.add(Dense(300,activation="relu"))
```

```
[27] model.add(Dense(5,activation="softmax"))
```

5. Compile The Model

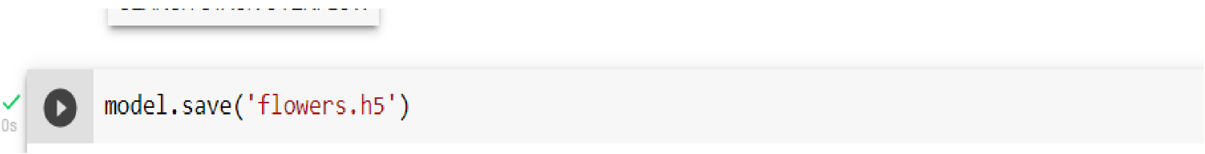


```
model.compile(loss="categorial_crossentropy",optimizer="adam",metrics=['accuracy'])
```

6. Fit The Model

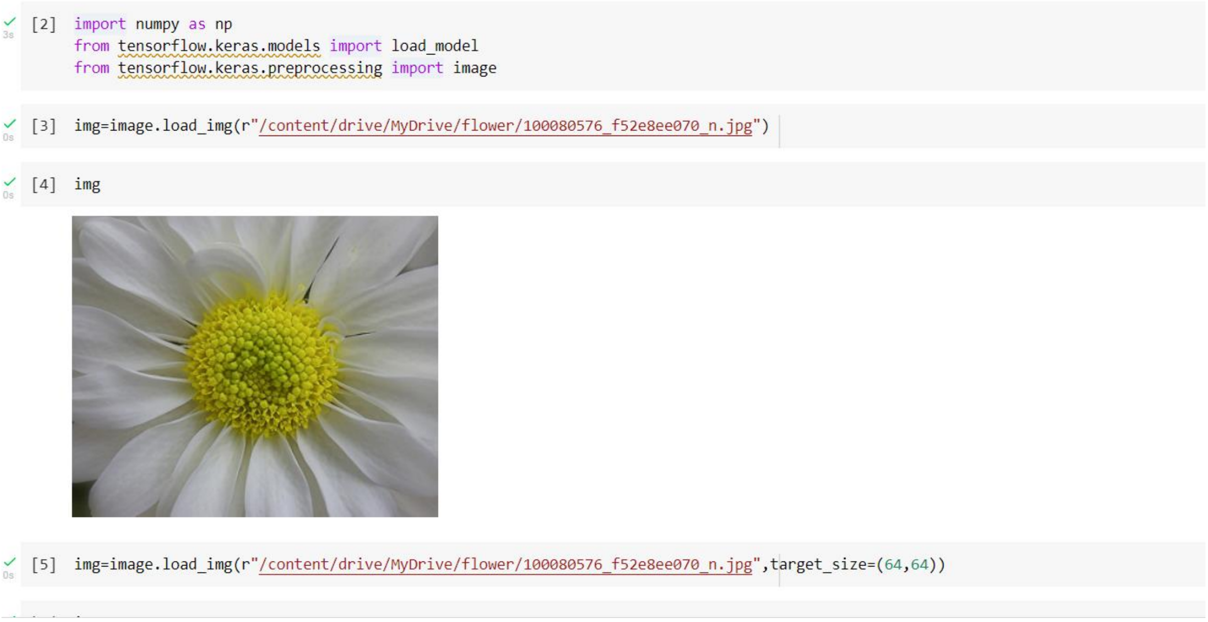
```
model.fit(x_data, epochs= 10, steps_per_epoch= len(x_data) ,validation_data=0.0,validation_steps=0.0)
```

7. Save The Model



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

8. Test The Model

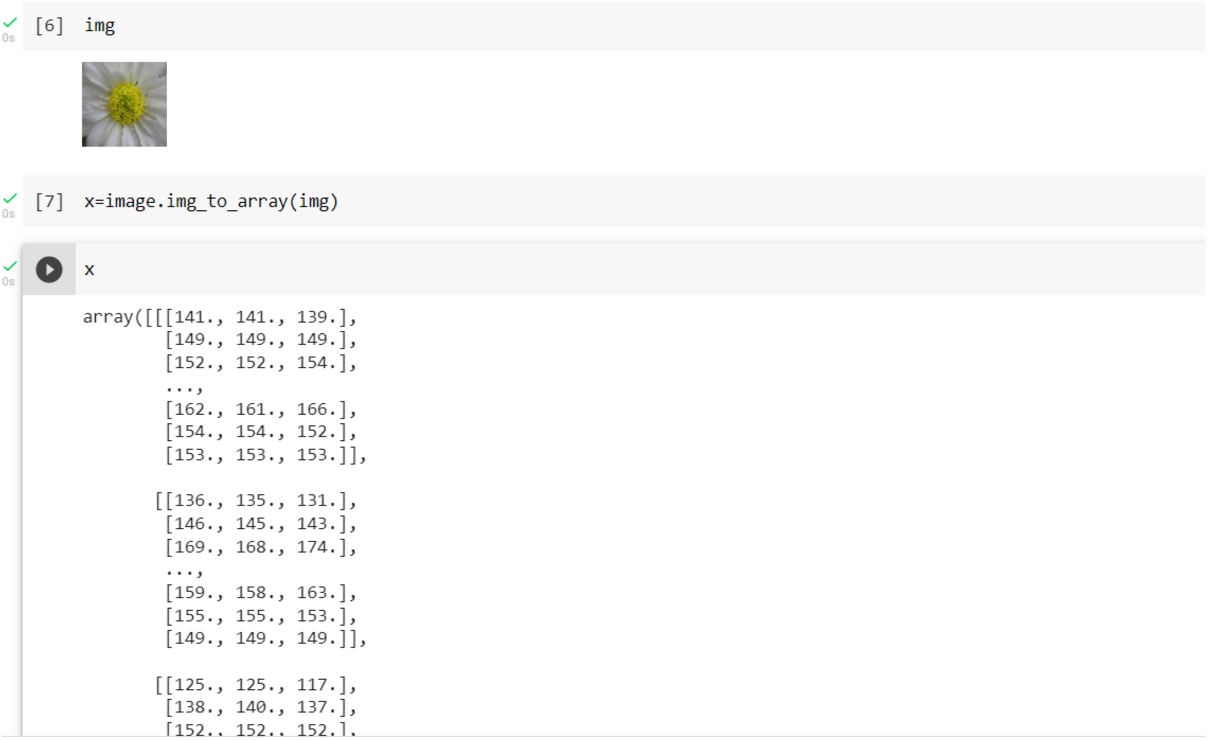


```
[2] import numpy as np
    from tensorflow.keras.models import load_model
    from tensorflow.keras.preprocessing import image
```

```
[3] img=image.load_img(r"/content/drive/MyDrive/flower/100080576_f52e8ee070_n.jpg")
```

```
[4] img
```

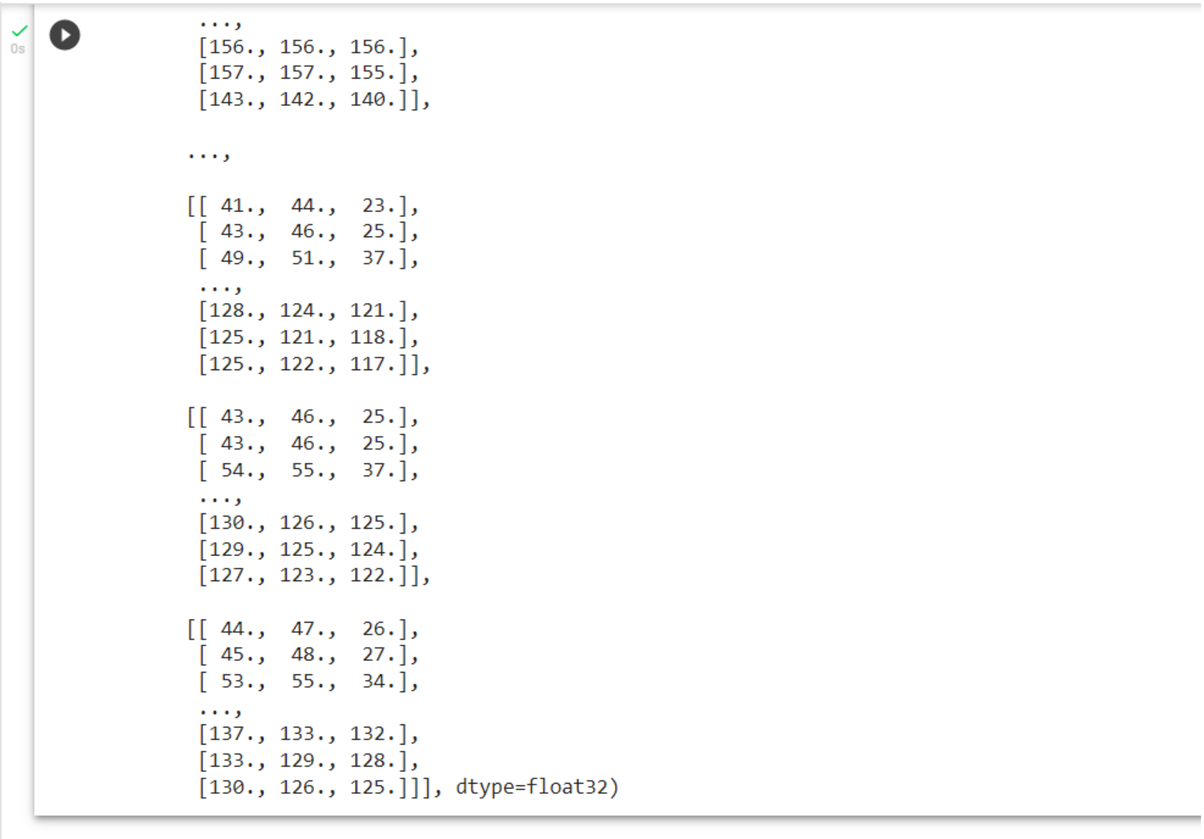
```
[5] img=image.load_img(r"/content/drive/MyDrive/flower/100080576_f52e8ee070_n.jpg",target_size=(64,64))
```



```
[6] img
```

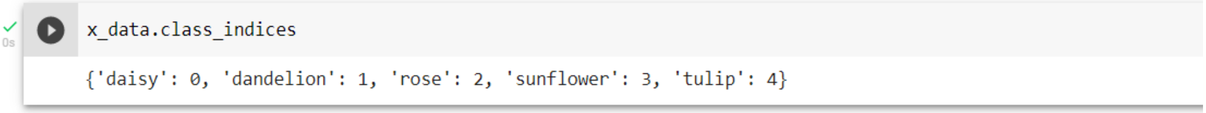
```
[7] x=image.img_to_array(img)
```

```
x

array([[[141., 141., 139.],
        [149., 149., 149.],
        [152., 152., 154.],
        ...,
        [162., 161., 166.],
        [154., 154., 152.],
        [153., 153., 153.]],

       [[136., 135., 131.],
        [146., 145., 143.],
        [169., 168., 174.],
        ...,
        [159., 158., 163.],
        [155., 155., 153.],
        [149., 149., 149.]],

       [[125., 125., 117.],
        [138., 140., 137.],
        [152., 152., 152.],
```



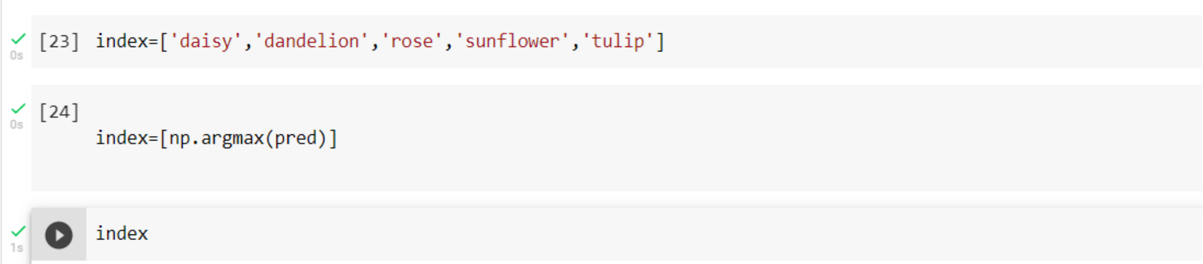
```
         ...,
         [156., 156., 156.],
         [157., 157., 155.],
         [143., 142., 140.]],

        ...,

        [[ 41.,  44.,  23.],
         [ 43.,  46.,  25.],
         [ 49.,  51.,  37.],
         ...,
         [128., 124., 121.],
         [125., 121., 118.],
         [125., 122., 117.]],

        [[ 43.,  46.,  25.],
         [ 43.,  46.,  25.],
         [ 54.,  55.,  37.],
         ...,
         [130., 126., 125.],
         [129., 125., 124.],
         [127., 123., 122.]],

        [[ 44.,  47.,  26.],
         [ 45.,  48.,  27.],
         [ 53.,  55.,  34.],
         ...,
         [137., 133., 132.],
         [133., 129., 128.],
         [130., 126., 125.]]], dtype=float32)
```

```
x=np.expand_dims(x,axis=0)
pred= model.predict(x)
x_data.class_indices
```



```
x_data.class_indices
```

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



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

```
[24]
     index=[np.argmax(pred)]
```

```
index
```

'daisy'