

Assignment -3
Python Programming

Assignment Date	18-11- 2022
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Maximum Marks	2 Marks

Question-1:

Download the Dataset

Solution:

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

```
# .....  
# .....  
# .....  
# .....
```

Download the Dataset

```
In [2]: from google.colab import drive  
drive.mount('/content/drive')
```

Drive already mounted at /content/drive; to attempt to forcibly remount, call drive.mount("/content/drive", force_remount=True).

Question-2:

Image Augmentation

Solution :

Image Augmentation

```
In [3]: import numpy as np
import pandas as pd
import matplotlib.pyplot as plt
from matplotlib import style
import seaborn as sns
import cv2
import matplotlib.pyplot as plt
import numpy as np
import pandas as pd
import os
import PIL
import random
import cv2
from tensorflow.keras import layers, models
import tensorflow as tf
import pandas as pd
from sklearn.model_selection import train_test_split
import seaborn as sns
import pickle
import zipfile
tf.__version__
```

```
Out[3]: '2.8.2'
```

```
In [4]: !ls
```

```
drive sample_data
```

```
In [5]: try:
    tpu = tf.distribute.cluster_resolver.TPUClusterResolver()
    print('Device:', tpu.master())
    tf.config.experimental_connect_to_cluster(tpu)
    tf.tpu.experimental.initialize_tpu_system(tpu)
    strategy = tf.distribute.experimental.TPUStrategy(tpu)
except:
    strategy = tf.distribute.get_strategy()
print('Number of replicas:', strategy.num_replicas_in_sync)
```

```
Number of replicas: 1
```

```
In [6]: AUTOTUNE = tf.data.experimental.AUTOTUNE
batch_size = 32
IMAGE_SIZE = [128, 128]
EPOCHS = 25
```

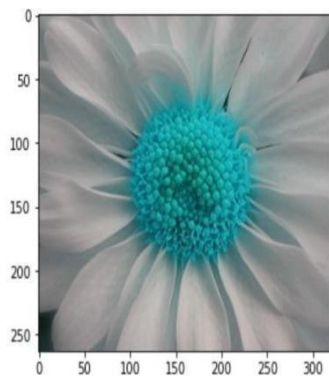
```
In [7]: image = cv2.imread(r'/content/drive/MyDrive/Flowers-Dataset/flowers/daisy/100080576_f52e8ee070_n.jpg')
```

```
In [8]: print(image.shape)
```

```
(263, 320, 3)
```

```
In [9]: imgplot = plt.imshow(image)
plt.show()
```

0 



```
In [10]: GCS_PATH = "/content/drive/MyDrive/Flowers-Dataset/flowers"

CLASS_NAMES = np.array([str(tf.strings.split(item, os.path.sep)[-1].numpy())[2:-1]
                        for item in tf.io.gfile.glob(str(GCS_PATH + "*/"))])

CLASS_NAMES
```

```
Out[10]: array(['daisy', 'rose', 'dandelion', 'sunflower', 'tulip'], dtype='<U9')
```

```
In [11]: files_count = []
for i, f in enumerate(CLASS_NAMES):
    folder_path = os.path.join(GCS_PATH, f)
    for path in os.listdir(os.path.join(folder_path)):
        files_count.append(['{}/{}'.format(folder_path, path), f, i])
flowers_df = pd.DataFrame(files_count, columns=['filepath', 'class_name', 'label'])
flowers_df.head()
```

```
Out[11]:
```

	filepath	class_name	label
0	/content/drive/MyDrive/Flowers-Dataset/flowers...	daisy	0
1	/content/drive/MyDrive/Flowers-Dataset/flowers...	daisy	0
2	/content/drive/MyDrive/Flowers-Dataset/flowers...	daisy	0
3	/content/drive/MyDrive/Flowers-Dataset/flowers...	daisy	0
4	/content/drive/MyDrive/Flowers-Dataset/flowers...	daisy	0

```
In [12]: flowers_df.class_name.value_counts()
```

```
Out[12]: dandelion    1052
tulip          984
rose           784
daisy          764
sunflower      733
Name: class_name, dtype: int64
```

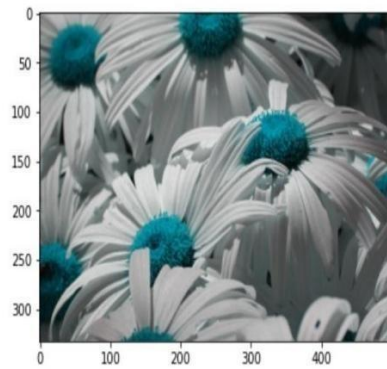
```
In [13]: quantidade_por_class = 500
flowers_df = pd.concat([flowers_df[flowers_df['class_name']== i][:quantidade_por_class] for i in CLASS_NAMES])
```

```
In [14]: flowers_df.class_name.value_counts()
```

```
Out[14]: daisy          500
rose          500
dandelion     500
sunflower     500
tulip         500
```

```
sunflower    500  
tulip        500  
Name: class_name, dtype: int64
```

```
In [15]: image = cv2.imread(flowers_df.filepath[100])  
imgplot = plt.imshow(image)  
plt.show()
```



Create Model

```
In [16]: X = flowers_df['filepath']  
y = flowers_df['label']  
  
x_train, x_test, y_train, y_test = train_test_split(X, y, test_size=0.3, random_state=101)
```

```
In [17]:
```

Question-3:

Create Model

Solution:

```
In [16]: X = flowers_df['filepath']
y = flowers_df['label']

x_train, x_test, y_train, y_test = train_test_split(X, y, test_size=0.3, random_state=101)
```

```
In [17]: x_train_tensor = tf.convert_to_tensor(x_train.values, dtype=tf.string)
y_train_tensor = tf.convert_to_tensor(y_train.values)

x_test_tensor = tf.convert_to_tensor(x_test.values, dtype=tf.string)
y_test_tensor = tf.convert_to_tensor(y_test.values)
```

```
In [18]: train_data = tf.data.Dataset.from_tensor_slices((x_train_tensor, y_train_tensor))
test_data = tf.data.Dataset.from_tensor_slices((x_test_tensor, y_test_tensor))
```

```
In [19]: def map_fn(path, label):
    image = tf.image.decode_jpeg(tf.io.read_file(path))

    return image, label

#apply the function
train_data_img = train_data.map(map_fn)
test_data_img = test_data.map(map_fn)
```

```
In [20]: fig, ax = plt.subplots(1,2, figsize = (15,5))
for i,l in train_data_img.take(1):
    ax[0].set_title('Image dataset to train');
    ax[0].imshow(i);
for i,l in test_data_img.take(1):
    ax[1].set_title('Image dataset to test');
    ax[1].imshow(i);
```