```
import numpy as np
import pandas as pd

# Loading the dataset
df = pd.read_csv('D:/ibm/datafile_02.csv')
print(df.columns)
df.head()
```

```
Index(['Port', 'Traffic in Eleventh Plan (MT) (2011-12)Proj.',
       'Traffic in Eleventh Plan (MT) (2011-12) Ach.',
       'Traffic in Eleventh Plan (MT) (2011-12) %',
       'Total Capacity  in Eleventh Plan (MT) (2011-12) Proj.',
       'Total Capacity  in Eleventh Plan (MT) (2011-12) Ach.',
       'Total Capacity  in Eleventh Plan (MT) (2011-12) %'],
      dtype='object')
```

	Port	Traffic in Eleventh Plan (MT) (2011-12)Proj.	Traffic in Eleventh Plan (MT) (2011-12) Ach.	Traffic in Eleventh Plan (MT) (2011-12) %	Total Capacity in Eleventh Plan (MT) (2011-12) Proj.	Total Capacity in Eleventh Plan (MT) (2011-12) Ach.
0	Kolkata	1343	1223	9100	3145	1635
1	Haldia	4450	3101	7000	6340	5070
2	Paradeep	7640	5425	7100	10640	7650
3	Visakhapatnam	8220	6742	8200	10810	7293
4	Ennore	4700	1496	3200	6420	3100

```
   Total Capacity  in Eleventh Plan (MT) (2011-12) %
0                                                5100
1                                                7900
2                                                7100
3                                                6700
4                                                4800
```

```
# Preprocessing the dataset

# Renaming the columns
df.rename(columns = {'Traffic in Eleventh Plan (MT) (2011-
12)Proj.':'Traffic_Projected','Traffic in Eleventh Plan (MT) (2011-12)
Ach.':'Traffic_Achieved', 'Total Capacity  in Eleventh Plan (MT)
(2011-12) Proj.':'Total_Capacity_Projected', 'Total Capacity  in
Eleventh Plan (MT) (2011-12) Ach.':'Total_Capacity_Achieved'}, inplace
= True)
df
```

```
             Port  Traffic_Projected  Traffic_Achieved  \
0         Kolkata               1343              1223
1          Haldia               4450              3101
2        Paradeep               7640              5425
3   Visakhapatnam               8220              6742
4          Ennore               4700              1496
5         Chennai               5750              5571
6       Tuticorin               3172              2810
7          Cochin               3817              2010
8            NMPT               4881              3294
9        Mormugao               4455              3900
10         Mumbai               7105              5618
11           JNPT               6604              6575
12         Kandla               8672              8250

    Traffic in Eleventh Plan (MT) (2011-12) %
Total_Capacity_Projected  \
0                                          9100
3145
1                                          7000
6340
2                                          7100
10640
3                                          8200
10810
4                                          3200
6420
5                                          9700
7230
6                                          8900
6398
```

```
7                                          5300
5475
8                                          6800
6050
9                                          8800
6690
10                                         7900
9191
11                                        10000
9560
12                                         9500
12220

    Total_Capacity_Achieved  Total Capacity  in Eleventh Plan (MT)
(2011-12) %
0                       1635
5100
1                       5070
7900
2                       7650
7100
3                       7293
6700
4                       3100
4800
5                       7972
11000
6                       3334
5200
7                       4098
7400
8                       5097
8400
9                       4190
6200
10                      4453
4800
11                      6400
6600
12                      8691
7100
```

```
# Perparing the Calculations:

Traffic_Percent =
round((df.Traffic_Achieved/df.Traffic_Projected)*100,2)

Traffic_Percent

0     91.06
1     69.69
```

```
2     71.01
3     82.02
4     31.83
5     96.89
6     88.59
7     52.66
8     67.49
9     87.54
10    79.07
11    99.56
12    95.13
dtype: float64
```

```
Total_Percent =
round( (df.Total_Capacity_Achieved/df.Total_Capacity_Projected)*100,2)
Total_Percent
```

```
0      51.99
1      79.97
2      71.90
3      67.47
4      48.29
5     110.26
6      52.11
7      74.85
8      84.25
9      62.63
10     48.45
11     66.95
12     71.12
dtype: float64
```

```
# Replacing the existing columns with newly created columns
df.rename(columns = {'Traffic in Eleventh Plan (MT) (2011-12)
%':'Traffic_Percent%','Total Capacity  in Eleventh Plan (MT) (2011-12)
%':'Total_Percent%'}, inplace = True)
df.iloc[:,3:4] = Traffic_Percent
df.iloc[:,6:] = Total_Percent
df
```

```
             Port  Traffic_Projected  Traffic_Achieved
Traffic_Percent%  \
0         Kolkata               1343              1223
91.06
1          Haldia               4450              3101
69.69
2        Paradeep               7640              5425
71.01
3   Visakhapatnam               8220              6742
82.02
4          Ennore               4700              1496
```

31.83
5 Chennai 5750 5571
96.89
6 Tuticorin 3172 2810
88.59
7 Cochin 3817 2010
52.66
8 NMPT 4881 3294
67.49
9 Mormugao 4455 3900
87.54
10 Mumbai 7105 5618
79.07
11 JNPT 6604 6575
99.56
12 Kandla 8672 8250
95.13

	Total_Capacity_Projected	Total_Capacity_Achieved	Total_Percent%
0	3145	1635	51.99
1	6340	5070	79.97
2	10640	7650	71.90
3	10810	7293	67.47
4	6420	3100	48.29
5	7230	7972	110.26
6	6398	3334	52.11
7	5475	4098	74.85
8	6050	5097	84.25
9	6690	4190	62.63
10	9191	4453	48.45
11	9560	6400	66.95
12	12220	8691	71.12

df.shape

(13, 7)

```
# Checking for null values

df.isnull().sum()

Port                         0
Traffic_Projected            0
Traffic_Achieved             0
Traffic_Percent%             0
Total_Capacity_Projected     0
Total_Capacity_Achieved      0
Total_Percent%               0
dtype: int64

# Summary of Dataset
df.info()

<class 'pandas.core.frame.DataFrame'>
RangeIndex: 13 entries, 0 to 12
Data columns (total 7 columns):
 #   Column                     Non-Null Count  Dtype
---  ------                     --------------  -----
 0   Port                       13 non-null     object
 1   Traffic_Projected          13 non-null     int64
 2   Traffic_Achieved           13 non-null     int64
 3   Traffic_Percent%           13 non-null     float64
 4   Total_Capacity_Projected   13 non-null     int64
 5   Total_Capacity_Achieved    13 non-null     int64
 6   Total_Percent%             13 non-null     float64
dtypes: float64(2), int64(4), object(1)
memory usage: 856.0+ bytes

df.describe()

       Traffic_Projected  Traffic_Achieved  Traffic_Percent%  \
count          13.000000         13.000000         13.000000
mean         5446.846154       4308.846154         77.887692
std          2133.280019       2212.894855         19.382398
min          1343.000000       1223.000000         31.830000
25%          4450.000000       2810.000000         69.690000
50%          4881.000000       3900.000000         82.020000
75%          7105.000000       5618.000000         91.060000
max          8672.000000       8250.000000         99.560000

       Total_Capacity_Projected  Total_Capacity_Achieved
Total_Percent%
count                 13.000000                13.000000
13.000000
mean                7705.307692              5306.384615
68.480000
std                 2570.242673              2140.254796
17.252637
```

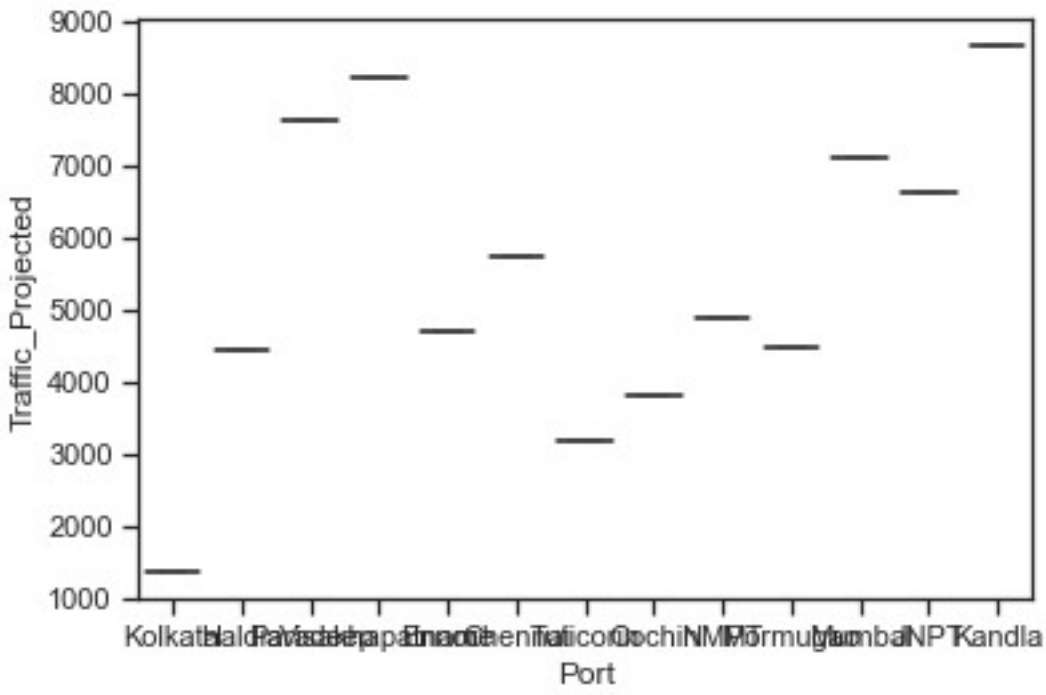
```
min                  3145.000000              1635.000000
48.290000
25%                  6340.000000              4098.000000
52.110000
50%                  6690.000000              5070.000000
67.470000
75%                  9560.000000              7293.000000
74.850000
max                 12220.000000              8691.000000
110.260000
```

```
#Finding Outliers anr replacing the outliers
```

```
import seaborn as sns
```

```
sns.boxplot(x='Port',y='Traffic_Projected',data=df)
```

```
<AxesSubplot:xlabel='Port', ylabel='Traffic_Projected'>
```




```
# Check For Categorical Columns and do encoding
```

```
from sklearn.preprocessing import LabelEncoder
le = LabelEncoder()
print(df.Port.value_counts())

df.Port = le.fit_transform(df.Port)
print(df.Port.value_counts())
```

```
Kolkata          1
Haldia           1
Paradeep         1
Visakhapatnam    1
Ennore           1
Chennai          1
Tuticorin        1
Cochin           1
NMPT             1
Mormugao         1
Mumbai           1
JNPT             1
Kandla           1
Name: Port, dtype: int64
6     1
3     1
10    1
12    1
2     1
0     1
11    1
1     1
9     1
7     1
8     1
4     1
5     1
Name: Port, dtype: int64
```