untitled4

March 10, 2024

```python
[1]: import pandas as pd
```

```python
[2]: pd.__version__
```

```
[2]: '2.1.4'
```

```python
[3]: tips_data=pd.Series(["total_bill" ,"tip" ,"sex","smoker","day","time","size"])
```

```python
[4]: tips_data
```

```
[4]: 0    total_bill
     1           tip
     2           sex
     3        smoker
     4           day
     5          time
     6          size
     dtype: object
```

```python
[7]: tips_data=pd.read_csv("tips.csv")
```

```python
[8]: tips_data
```

```
[8]:      total_bill   tip     sex smoker   day    time  size
     0         16.99  1.01  Female     No   Sun  Dinner     2
     1         10.34  1.66    Male     No   Sun  Dinner     3
     2         21.01  3.50    Male     No   Sun  Dinner     3
     3         23.68  3.31    Male     No   Sun  Dinner     2
     4         24.59  3.61  Female     No   Sun  Dinner     4
     ..          ...   ...     ...    ...   ...     ...   ...
     239       29.03  5.92    Male     No   Sat  Dinner     3
     240       27.18  2.00  Female    Yes   Sat  Dinner     2
     241       22.67  2.00    Male    Yes   Sat  Dinner     2
     242       17.82  1.75    Male     No   Sat  Dinner     2
     243       18.78  3.00  Female     No  Thur  Dinner     2

     [244 rows x 7 columns]
```

```
[9]: tips_data.to_csv("export_tips.csv",index=False)
```

```
[10]: export_tips=pd.read_csv("export_tips.csv")
```

```
[11]: export_tips
```

```
[11]:      total_bill   tip     sex smoker   day    time  size
      0         16.99  1.01  Female     No   Sun  Dinner     2
      1         10.34  1.66    Male     No   Sun  Dinner     3
      2         21.01  3.50    Male     No   Sun  Dinner     3
      3         23.68  3.31    Male     No   Sun  Dinner     2
      4         24.59  3.61  Female     No   Sun  Dinner     4
      ..          ...   ...     ...    ...   ...     ...   ...
      239       29.03  5.92    Male     No   Sat  Dinner     3
      240       27.18  2.00  Female    Yes   Sat  Dinner     2
      241       22.67  2.00    Male    Yes   Sat  Dinner     2
      242       17.82  1.75    Male     No   Sat  Dinner     2
      243       18.78  3.00  Female     No  Thur  Dinner     2

      [244 rows x 7 columns]
```

```
[12]: export_tips.describe()
```

```
[12]:        total_bill         tip        size
      count  244.000000  244.000000  244.000000
      mean    19.785943    2.998279    2.569672
      std      8.902412    1.383638    0.951100
      min      3.070000    1.000000    1.000000
      25%     13.347500    2.000000    2.000000
      50%     17.795000    2.900000    2.000000
      75%     24.127500    3.562500    3.000000
      max     50.810000   10.000000    6.000000
```

```
[13]: export_tips.dtypes
```

```
[13]: total_bill    float64
      tip           float64
      sex            object
      smoker         object
      day            object
      time           object
      size            int64
      dtype: object
```

```
[14]: export_tips.dtypes
```

```
[14]: total_bill     float64
      tip            float64
      sex             object
      smoker          object
      day             object
      time            object
      size             int64
      dtype: object
```

```
[15]: export_tips.info()
```

```
<class 'pandas.core.frame.DataFrame'>
RangeIndex: 244 entries, 0 to 243
Data columns (total 7 columns):
 #   Column      Non-Null Count  Dtype
---  ------      --------------  -----
 0   total_bill  244 non-null    float64
 1   tip         244 non-null    float64
 2   sex         244 non-null    object
 3   smoker      244 non-null    object
 4   day         244 non-null    object
 5   time        244 non-null    object
 6   size        244 non-null    int64
dtypes: float64(2), int64(1), object(4)
memory usage: 13.5+ KB
```

```
[16]: export_tips.columns
```

```
[16]: Index(['total_bill', 'tip', 'sex', 'smoker', 'day', 'time', 'size'],
      dtype='object')
```

```
[17]: tips_columns=export_tips.columns
```

```
[18]: tips_columns
```

```
[18]: Index(['total_bill', 'tip', 'sex', 'smoker', 'day', 'time', 'size'],
      dtype='object')
```

```
[19]: tips_columns
```

```
[19]: Index(['total_bill', 'tip', 'sex', 'smoker', 'day', 'time', 'size'],
      dtype='object')
```

```
[21]: tips_columns
```

```
[21]: Index(['total_bill', 'tip', 'sex', 'smoker', 'day', 'time', 'size'],
      dtype='object')
```

```
[22]: export_tips.index
```

```
[22]: RangeIndex(start=0, stop=244, step=1)
```

```
[23]: export_tips
```

```
[23]:      total_bill   tip      sex smoker    day     time   size
      0          16.99  1.01  Female      No    Sun  Dinner      2
      1          10.34  1.66    Male      No    Sun  Dinner      3
      2          21.01  3.50    Male      No    Sun  Dinner      3
      3          23.68  3.31    Male      No    Sun  Dinner      2
      4          24.59  3.61  Female      No    Sun  Dinner      4
      ..           ...   ...     ...     ...    ...     ...    ...
      239        29.03  5.92    Male      No    Sat  Dinner      3
      240        27.18  2.00  Female     Yes    Sat  Dinner      2
      241        22.67  2.00    Male     Yes    Sat  Dinner      2
      242        17.82  1.75    Male      No    Sat  Dinner      2
      243        18.78  3.00  Female      No   Thur  Dinner      2

      [244 rows x 7 columns]
```

```
[24]: export_tips.describe
```

```
[24]: <bound method NDFrame.describe of      total_bill   tip      sex smoker    day
      time   size
      0          16.99  1.01  Female      No    Sun  Dinner      2
      1          10.34  1.66    Male      No    Sun  Dinner      3
      2          21.01  3.50    Male      No    Sun  Dinner      3
      3          23.68  3.31    Male      No    Sun  Dinner      2
      4          24.59  3.61  Female      No    Sun  Dinner      4
      ..           ...   ...     ...     ...    ...     ...    ...
      239        29.03  5.92    Male      No    Sat  Dinner      3
      240        27.18  2.00  Female     Yes    Sat  Dinner      2
      241        22.67  2.00    Male     Yes    Sat  Dinner      2
      242        17.82  1.75    Male      No    Sat  Dinner      2
      243        18.78  3.00  Female      No   Thur  Dinner      2

      [244 rows x 7 columns]>
```

```
[25]: tips_data.describe
```

```
[25]: <bound method NDFrame.describe of      total_bill   tip      sex smoker    day
      time   size
      0          16.99  1.01  Female      No    Sun  Dinner      2
      1          10.34  1.66    Male      No    Sun  Dinner      3
      2          21.01  3.50    Male      No    Sun  Dinner      3
      3          23.68  3.31    Male      No    Sun  Dinner      2
```

```
4           24.59  3.61  Female      No   Sun  Dinner      4
..             …      …       …       …     …      …        …
239         29.03  5.92    Male      No   Sat  Dinner      3
240         27.18  2.00  Female     Yes   Sat  Dinner      2
241         22.67  2.00    Male     Yes   Sat  Dinner      2
242         17.82  1.75    Male      No   Sat  Dinner      2
243         18.78  3.00  Female      No  Thur  Dinner      2

[244 rows x 7 columns]>
```

[26]: `tips_data.info`

[26]:
```
<bound method DataFrame.info of      total_bill    tip     sex smoker    day
time   size
0           16.99  1.01  Female      No   Sun  Dinner      2
1           10.34  1.66    Male      No   Sun  Dinner      3
2           21.01  3.50    Male      No   Sun  Dinner      3
3           23.68  3.31    Male      No   Sun  Dinner      2
4           24.59  3.61  Female      No   Sun  Dinner      4
..             …      …       …       …     …      …        …
239         29.03  5.92    Male      No   Sat  Dinner      3
240         27.18  2.00  Female     Yes   Sat  Dinner      2
241         22.67  2.00    Male     Yes   Sat  Dinner      2
242         17.82  1.75    Male      No   Sat  Dinner      2
243         18.78  3.00  Female      No  Thur  Dinner      2

[244 rows x 7 columns]>
```

[27]: `tips_data[["total_bill","tip"]].mean()`

[27]:
```
total_bill    19.785943
tip            2.998279
dtype: float64
```

[28]: `tips_data.sum()`

[28]:
```
total_bill                                             4827.77
tip                                                     731.58
sex           FemaleMaleMaleMaleFemaleMaleMaleMaleMaleMaleMa…
smoker        NoNoNoNoNoNoNoNoNoNoNoNoNoNoNoNoNoNoNoNoNoNoNo…
day           SunSunSunSunSunSunSunSunSunSunSunSunSunSunSunS…
time          DinnerDinnerDinnerDinnerDinnerDinnerDinnerDinn…
size                                                       627
dtype: object
```

[29]: `tips_data["total_bill"].sum()`

```
[29]: 4827.77

[30]: tips_data["tip"].sum()

[30]: 731.5799999999999

[31]: tips_data["smoker"].sum()

[31]: 'NoNoNoNoNoNoNoNoNoNoNoNoNoNoNoNoNoNoNoNoNoNoNoNoNoNoNoNoNoNoNoNoNoNoNoNoNoNoN
      oNoNoNoNoNoNoNoNoNoNoNoNoNoNoNoNoNoYesNoYesNoYesYesYesYesNoNoNoYesNoYesNoNoYesYesN
      oNoYesNoNoNoYesNoNoYesNoNoNoNoNoNoYesNoYesYesNoYesYesYesYesNoYesYesYesYesNoYesYe
      sYesNoYesNoNoNoNoNoNoNoNoNoNoNoNoNoNoNoNoNoNoNoNoNoNoNoNoNoNoYesNoNoNoNoNoNo
      NoNoNoNoNoNoNoNoNoNoNoNoNoNoNoNoNoNoYesNoNoNoYesYesYesYesYesYesYesYesYesYesYes
      YesYesYesYesYesYesNoYesYesYesYesYesYesYesYesYesNoYesYesYesYesYesYesYesYesYesY
      esYesYesYesYesYesNoYesYesYesYesYesYesYesYesYesYesNoYesYesYesNoNoYesYesYesNoNoYes
      NoYesYesNoNoYesYesNoNo'

[32]: len(tips_data)

[32]: 244

[33]: tips_data.head(50)

[33]:     total_bill   tip     sex smoker  day    time  size
      0        16.99  1.01  Female     No  Sun  Dinner     2
      1        10.34  1.66    Male     No  Sun  Dinner     3
      2        21.01  3.50    Male     No  Sun  Dinner     3
      3        23.68  3.31    Male     No  Sun  Dinner     2
      4        24.59  3.61  Female     No  Sun  Dinner     4
      5        25.29  4.71    Male     No  Sun  Dinner     4
      6         8.77  2.00    Male     No  Sun  Dinner     2
      7        26.88  3.12    Male     No  Sun  Dinner     4
      8        15.04  1.96    Male     No  Sun  Dinner     2
      9        14.78  3.23    Male     No  Sun  Dinner     2
      10       10.27  1.71    Male     No  Sun  Dinner     2
      11       35.26  5.00  Female     No  Sun  Dinner     4
      12       15.42  1.57    Male     No  Sun  Dinner     2
      13       18.43  3.00    Male     No  Sun  Dinner     4
      14       14.83  3.02  Female     No  Sun  Dinner     2
      15       21.58  3.92    Male     No  Sun  Dinner     2
      16       10.33  1.67  Female     No  Sun  Dinner     3
      17       16.29  3.71    Male     No  Sun  Dinner     3
      18       16.97  3.50  Female     No  Sun  Dinner     3
      19       20.65  3.35    Male     No  Sat  Dinner     3
      20       17.92  4.08    Male     No  Sat  Dinner     2
      21       20.29  2.75  Female     No  Sat  Dinner     2
      22       15.77  2.23  Female     No  Sat  Dinner     2
```

```
23      39.42   7.58     Male      No    Sat    Dinner     4
24      19.82   3.18     Male      No    Sat    Dinner     2
25      17.81   2.34     Male      No    Sat    Dinner     4
26      13.37   2.00     Male      No    Sat    Dinner     2
27      12.69   2.00     Male      No    Sat    Dinner     2
28      21.70   4.30     Male      No    Sat    Dinner     2
29      19.65   3.00   Female      No    Sat    Dinner     2
30       9.55   1.45     Male      No    Sat    Dinner     2
31      18.35   2.50     Male      No    Sat    Dinner     4
32      15.06   3.00   Female      No    Sat    Dinner     2
33      20.69   2.45   Female      No    Sat    Dinner     4
34      17.78   3.27     Male      No    Sat    Dinner     2
35      24.06   3.60     Male      No    Sat    Dinner     3
36      16.31   2.00     Male      No    Sat    Dinner     3
37      16.93   3.07   Female      No    Sat    Dinner     3
38      18.69   2.31     Male      No    Sat    Dinner     3
39      31.27   5.00     Male      No    Sat    Dinner     3
40      16.04   2.24     Male      No    Sat    Dinner     3
41      17.46   2.54     Male      No    Sun    Dinner     2
42      13.94   3.06     Male      No    Sun    Dinner     2
43       9.68   1.32     Male      No    Sun    Dinner     2
44      30.40   5.60     Male      No    Sun    Dinner     4
45      18.29   3.00     Male      No    Sun    Dinner     2
46      22.23   5.00     Male      No    Sun    Dinner     2
47      32.40   6.00     Male      No    Sun    Dinner     4
48      28.55   2.05     Male      No    Sun    Dinner     3
49      18.04   3.00     Male      No    Sun    Dinner     2
```

[34]: `tips_data.head(15)`

[34]:
```
      total_bill    tip      sex smoker  day     time   size
0          16.99   1.01   Female     No  Sun   Dinner      2
1          10.34   1.66     Male     No  Sun   Dinner      3
2          21.01   3.50     Male     No  Sun   Dinner      3
3          23.68   3.31     Male     No  Sun   Dinner      2
4          24.59   3.61   Female     No  Sun   Dinner      4
5          25.29   4.71     Male     No  Sun   Dinner      4
6           8.77   2.00     Male     No  Sun   Dinner      2
7          26.88   3.12     Male     No  Sun   Dinner      4
8          15.04   1.96     Male     No  Sun   Dinner      2
9          14.78   3.23     Male     No  Sun   Dinner      2
10         10.27   1.71     Male     No  Sun   Dinner      2
11         35.26   5.00   Female     No  Sun   Dinner      4
12         15.42   1.57     Male     No  Sun   Dinner      2
13         18.43   3.00     Male     No  Sun   Dinner      4
14         14.83   3.02   Female     No  Sun   Dinner      2
```

```
[35]: tips_data.tail(15)
```

```
[35]:      total_bill   tip     sex smoker   day    time  size
      229       22.12  2.88  Female    Yes   Sat  Dinner     2
      230       24.01  2.00    Male    Yes   Sat  Dinner     4
      231       15.69  3.00    Male    Yes   Sat  Dinner     3
      232       11.61  3.39    Male     No   Sat  Dinner     2
      233       10.77  1.47    Male     No   Sat  Dinner     2
      234       15.53  3.00    Male    Yes   Sat  Dinner     2
      235       10.07  1.25    Male     No   Sat  Dinner     2
      236       12.60  1.00    Male    Yes   Sat  Dinner     2
      237       32.83  1.17    Male    Yes   Sat  Dinner     2
      238       35.83  4.67  Female     No   Sat  Dinner     3
      239       29.03  5.92    Male     No   Sat  Dinner     3
      240       27.18  2.00  Female    Yes   Sat  Dinner     2
      241       22.67  2.00    Male    Yes   Sat  Dinner     2
      242       17.82  1.75    Male     No   Sat  Dinner     2
      243       18.78  3.00  Female     No  Thur  Dinner     2
```

```
[36]: tips_data.tail(5)
```

```
[36]:      total_bill   tip     sex smoker   day    time  size
      239       29.03  5.92    Male     No   Sat  Dinner     3
      240       27.18  2.00  Female    Yes   Sat  Dinner     2
      241       22.67  2.00    Male    Yes   Sat  Dinner     2
      242       17.82  1.75    Male     No   Sat  Dinner     2
      243       18.78  3.00  Female     No  Thur  Dinner     2
```

```
[37]: tips_data.loc[9]
```

```
[37]: total_bill      14.78
      tip              3.23
      sex              Male
      smoker             No
      day               Sun
      time           Dinner
      size                2
      Name: 9, dtype: object
```

```
[38]: tips_data.iloc[5]
```

```
[38]: total_bill      25.29
      tip              4.71
      sex              Male
      smoker             No
      day               Sun
      time           Dinner
```

```
size               4
Name: 5, dtype: object
```

[39]:
```python
tips_data.iloc[3]
```

[39]:
```
total_bill      23.68
tip              3.31
sex              Male
smoker             No
day               Sun
time           Dinner
size                2
Name: 3, dtype: object
```

[45]:
```python
import matplotlib
import matplotlib as plt
tips_data
```
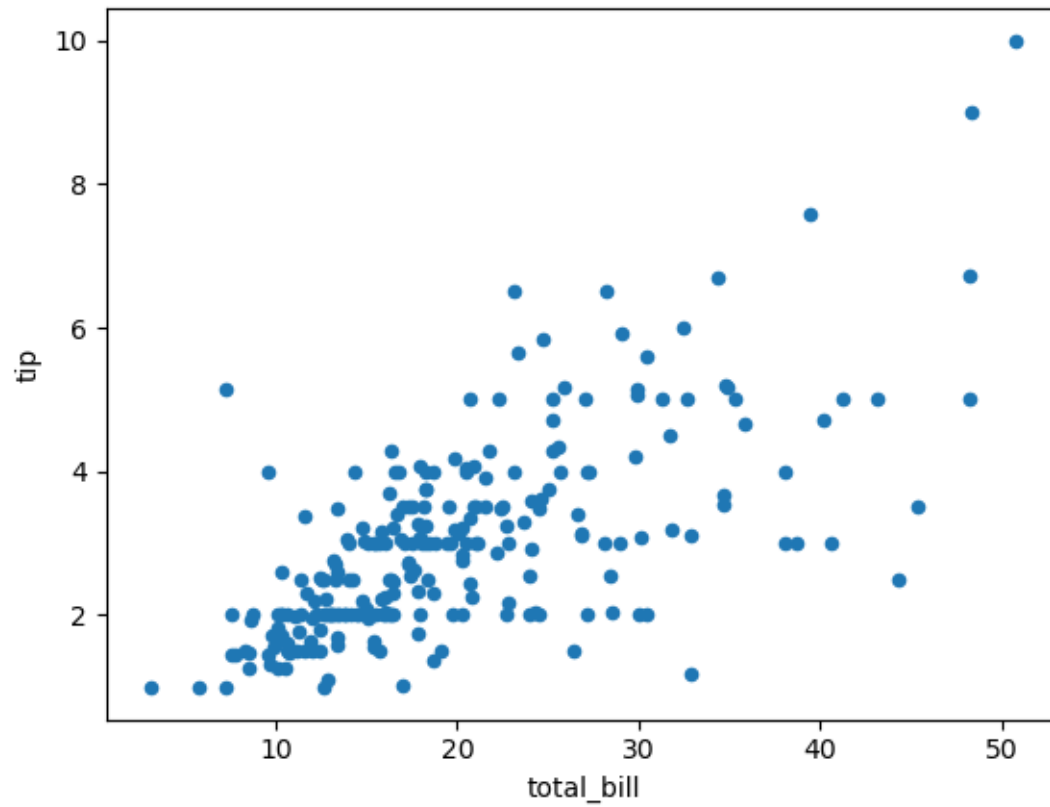
[45]:
```
     total_bill    tip     sex smoker   day    time  size
0         16.99   1.01  Female     No   Sun  Dinner     2
1         10.34   1.66    Male     No   Sun  Dinner     3
2         21.01   3.50    Male     No   Sun  Dinner     3
3         23.68   3.31    Male     No   Sun  Dinner     2
4         24.59   3.61  Female     No   Sun  Dinner     4
..          ...    ...     ...    ...   ...     ...   ...
239       29.03   5.92    Male     No   Sat  Dinner     3
240       27.18   2.00  Female    Yes   Sat  Dinner     2
241       22.67   2.00    Male    Yes   Sat  Dinner     2
242       17.82   1.75    Male     No   Sat  Dinner     2
243       18.78   3.00  Female     No  Thur  Dinner     2

[244 rows x 7 columns]
```

[46]:
```python
tips_data.plot(kind="scatter",x="total_bill",y="tip")
```

[46]: <Axes: xlabel='total_bill', ylabel='tip'>

```
[47]: tips_data.plot(kind="scatter",x="tip",y="sex")
```

```
[47]: <Axes: xlabel='tip', ylabel='sex'>
```