

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

```
In [2]: df=pd.read_csv('g:/dataset/analysis/restaurant.csv')
```

```
In [3]: df
```

```
Out[3]:    total_bill  tip  gender  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 × 7 columns

```
In [4]: df.loc[0]
```

```
Out[4]: total_bill      16.99
tip          1.01
gender      Female
smoker        No
day           Sun
time      Dinner
size          2
Name: 0, dtype: object
```

```
In [5]: df.loc[[0,2]]
```

```
Out[5]:    total_bill  tip  gender  smoker  day  time  size
```

0	16.99	1.01	Female	No	Sun	Dinner	2
2	21.01	3.50	Male	No	Sun	Dinner	3

```
In [6]: df.rename({0:'pawan',1:'yadav'},axis=0,inplace=True)
```

```
In [7]: df
```

```
Out[7]:
```

	total_bill	tip	gender	smoker	day	time	size
pawan	16.99	1.01	Female	No	Sun	Dinner	2
yadav	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 × 7 columns

```
In [8]: df.loc[2]
```

```
Out[8]:
```

total_bill	21.01
tip	3.5
gender	Male
smoker	No
day	Sun
time	Dinner
size	3
Name:	2, dtype: object

```
In [10]: df.loc['pawan']
```

```
Out[10]:
```

total_bill	16.99
tip	1.01
gender	Female
smoker	No
day	Sun
time	Dinner
size	2
Name:	pawan, dtype: object

```
In [11]: df.loc[['pawan']]
```

```
Out[11]:
```

	total_bill	tip	gender	smoker	day	time	size
pawan	16.99	1.01	Female	No	Sun	Dinner	2

```
In [12]: df[['total_bill']]
```

```
Out[12]:
```

	total_bill
pawan	16.99
yadav	10.34
2	21.01
3	23.68
4	24.59
...	...
239	29.03
240	27.18
241	22.67
242	17.82
243	18.78

244 rows × 1 columns

```
In [13]:
```

```
df.loc[['pawan', 'yadav', 100]]
```

```
Out[13]:
```

	total_bill	tip	gender	smoker	day	time	size
pawan	16.99	1.01	Female	No	Sun	Dinner	2
yadav	10.34	1.66	Male	No	Sun	Dinner	3
100	11.35	2.50	Female	Yes	Fri	Dinner	2

```
In [15]:
```

```
df[['total_bill', 'tip', 'day']]
```

```
Out[15]:
```

	total_bill	tip	day
pawan	16.99	1.01	Sun
yadav	10.34	1.66	Sun
2	21.01	3.50	Sun
3	23.68	3.31	Sun
4	24.59	3.61	Sun
...
239	29.03	5.92	Sat
240	27.18	2.00	Sat
241	22.67	2.00	Sat
242	17.82	1.75	Sat
243	18.78	3.00	Thur

244 rows × 3 columns

```
In [16]:
```

```
df.loc[['pawan']]['gender']
```

```
Out[16]: pawan    Female  
Name: gender, dtype: object
```

```
In [18]: df.iloc[[0]]
```

```
Out[18]:   total_bill  tip  gender  smoker  day  time  size  
pawan      16.99  1.01  Female     No  Sun Dinner     2
```

```
In [19]: df.iloc[[0,1,5,100]]
```

```
Out[19]:   total_bill  tip  gender  smoker  day  time  size  
pawan      16.99  1.01  Female     No  Sun Dinner     2  
yadav      10.34  1.66  Male      No  Sun Dinner     3  
5          25.29  4.71  Male      No  Sun Dinner     4  
100         11.35  2.50  Female    Yes  Fri Dinner     2
```

```
In [23]: # df.loc[[2]]  
df.iloc[[2]]
```

```
Out[23]:   total_bill  tip  gender  smoker  day  time  size  
2          21.01  3.5  Male      No  Sun Dinner     3
```

```
In [29]: df.iloc[[0]]
```

```
Out[29]:   total_bill  tip  gender  smoker  day  time  size  
pawan      16.99  1.01  Female     No  Sun Dinner     2
```

```
In [36]: df.loc[2:50:5,'total_bill':'day':1]
```

```
Out[36]:   total_bill  tip  gender  smoker  day  
2          21.01  3.50  Male      No  Sun  
7          26.88  3.12  Male      No  Sun  
12         15.42  1.57  Male      No  Sun  
17         16.29  3.71  Male      No  Sun  
22         15.77  2.23  Female    No  Sat  
27         12.69  2.00  Male      No  Sat  
32         15.06  3.00  Female    No  Sat  
37         16.93  3.07  Female    No  Sat  
42         13.94  3.06  Male      No  Sun  
47         32.40  6.00  Male      No  Sun
```

```
In [37]: df.loc[5:50:5,'total_bill':'size':2]
```

Out[37]:

	total_bill	gender	day	size
5	25.29	Male	Sun	4
10	10.27	Male	Sun	2
15	21.58	Male	Sun	2
20	17.92	Male	Sat	2
25	17.81	Male	Sat	4
30	9.55	Male	Sat	2
35	24.06	Male	Sat	3
40	16.04	Male	Sat	3
45	18.29	Male	Sun	2
50	12.54	Male	Sun	2

In [38]:

```
df.iloc[0:50:5,0:6:1]
```

Out[38]:

	total_bill	tip	gender	smoker	day	time
pawan	16.99	1.01	Female	No	Sun	Dinner
5	25.29	4.71	Male	No	Sun	Dinner
10	10.27	1.71	Male	No	Sun	Dinner
15	21.58	3.92	Male	No	Sun	Dinner
20	17.92	4.08	Male	No	Sat	Dinner
25	17.81	2.34	Male	No	Sat	Dinner
30	9.55	1.45	Male	No	Sat	Dinner
35	24.06	3.60	Male	No	Sat	Dinner
40	16.04	2.24	Male	No	Sat	Dinner
45	18.29	3.00	Male	No	Sun	Dinner

In [40]:

```
df.iloc[0:50:5,0:-1:2]
```

Out[40]:

	total_bill	gender	day
pawan	16.99	Female	Sun
5	25.29	Male	Sun
10	10.27	Male	Sun
15	21.58	Male	Sun
20	17.92	Male	Sat
25	17.81	Male	Sat
30	9.55	Male	Sat
35	24.06	Male	Sat
40	16.04	Male	Sat
45	18.29	Male	Sun

In [43]:

```
df.iloc[0:10:,0:6]
```

Out[43]:

	total_bill	tip	gender	smoker	day	time
pawan	16.99	1.01	Female	No	Sun	Dinner
yadav	10.34	1.66	Male	No	Sun	Dinner
2	21.01	3.50	Male	No	Sun	Dinner
3	23.68	3.31	Male	No	Sun	Dinner
4	24.59	3.61	Female	No	Sun	Dinner
5	25.29	4.71	Male	No	Sun	Dinner
6	8.77	2.00	Male	No	Sun	Dinner
7	26.88	3.12	Male	No	Sun	Dinner
8	15.04	1.96	Male	No	Sun	Dinner
9	14.78	3.23	Male	No	Sun	Dinner

In [44]:

```
df.iloc[5:,:6]
```

Out[44]:

	total_bill	tip	gender	smoker	day	time
5	25.29	4.71	Male	No	Sun	Dinner
6	8.77	2.00	Male	No	Sun	Dinner
7	26.88	3.12	Male	No	Sun	Dinner
8	15.04	1.96	Male	No	Sun	Dinner
9	14.78	3.23	Male	No	Sun	Dinner
...
239	29.03	5.92	Male	No	Sat	Dinner
240	27.18	2.00	Female	Yes	Sat	Dinner
241	22.67	2.00	Male	Yes	Sat	Dinner
242	17.82	1.75	Male	No	Sat	Dinner
243	18.78	3.00	Female	No	Thur	Dinner

239 rows × 6 columns

In [45]:

```
df.iloc[5:,:-1]
```

Out[45]:

	size	time	day	smoker	gender	tip	total_bill
5	4	Dinner	Sun	No	Male	4.71	25.29
6	2	Dinner	Sun	No	Male	2.00	8.77
7	4	Dinner	Sun	No	Male	3.12	26.88
8	2	Dinner	Sun	No	Male	1.96	15.04
9	2	Dinner	Sun	No	Male	3.23	14.78
...
239	3	Dinner	Sat	No	Male	5.92	29.03
240	2	Dinner	Sat	Yes	Female	2.00	27.18
241	2	Dinner	Sat	Yes	Male	2.00	22.67
242	2	Dinner	Sat	No	Male	1.75	17.82
243	2	Dinner	Thur	No	Female	3.00	18.78

239 rows × 7 columns

In [46]:

```
df.iloc[:-1,:-1]
```

Out[46]:

	size	time	day	smoker	gender	tip	total_bill
243	2	Dinner	Thur	No	Female	3.00	18.78
242	2	Dinner	Sat	No	Male	1.75	17.82
241	2	Dinner	Sat	Yes	Male	2.00	22.67
240	2	Dinner	Sat	Yes	Female	2.00	27.18
239	3	Dinner	Sat	No	Male	5.92	29.03
...
4	4	Dinner	Sun	No	Female	3.61	24.59
3	2	Dinner	Sun	No	Male	3.31	23.68
2	3	Dinner	Sun	No	Male	3.50	21.01
yadav	3	Dinner	Sun	No	Male	1.66	10.34
pawan	2	Dinner	Sun	No	Female	1.01	16.99

244 rows × 7 columns

In [47]:

df

Out[47]:

	total_bill	tip	gender	smoker	day	time	size
pawan	16.99	1.01	Female	No	Sun	Dinner	2
yadav	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 × 7 columns

In [48]:

df.loc['pawan', 'total_bill']

Out[48]:

16.99

In [49]:

df

Out[49]:

	total_bill	tip	gender	smoker	day	time	size
pawan	16.99	1.01	Female	No	Sun	Dinner	2
yadav	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 × 7 columns

In [63]:

```
df.iloc[5:51,[4,2,1]]
```

Out[63]:

	day	gender	tip
5	Sun	Male	4.71
6	Sun	Male	2.00
7	Sun	Male	3.12
8	Sun	Male	1.96
9	Sun	Male	3.23
10	Sun	Male	1.71
11	Sun	Female	5.00
12	Sun	Male	1.57
13	Sun	Male	3.00
14	Sun	Female	3.02
15	Sun	Male	3.92
16	Sun	Female	1.67
17	Sun	Male	3.71
18	Sun	Female	3.50
19	Sat	Male	3.35
20	Sat	Male	4.08
21	Sat	Female	2.75
22	Sat	Female	2.23
23	Sat	Male	7.58
24	Sat	Male	3.18
25	Sat	Male	2.34
26	Sat	Male	2.00
27	Sat	Male	2.00
28	Sat	Male	4.30
29	Sat	Female	3.00
30	Sat	Male	1.45
31	Sat	Male	2.50
32	Sat	Female	3.00
33	Sat	Female	2.45
34	Sat	Male	3.27
35	Sat	Male	3.60
36	Sat	Male	2.00
37	Sat	Female	3.07
38	Sat	Male	2.31
39	Sat	Male	5.00
40	Sat	Male	2.24

	day	gender	tip
41	Sun	Male	2.54
42	Sun	Male	3.06
43	Sun	Male	1.32
44	Sun	Male	5.60
45	Sun	Male	3.00
46	Sun	Male	5.00
47	Sun	Male	6.00
48	Sun	Male	2.05
49	Sun	Male	3.00
50	Sun	Male	2.50

```
In [64]: df.iloc[5:51,4:0:-1]
```

Out[64]:

	day	smoker	gender	tip
5	Sun	No	Male	4.71
6	Sun	No	Male	2.00
7	Sun	No	Male	3.12
8	Sun	No	Male	1.96
9	Sun	No	Male	3.23
10	Sun	No	Male	1.71
11	Sun	No	Female	5.00
12	Sun	No	Male	1.57
13	Sun	No	Male	3.00
14	Sun	No	Female	3.02
15	Sun	No	Male	3.92
16	Sun	No	Female	1.67
17	Sun	No	Male	3.71
18	Sun	No	Female	3.50
19	Sat	No	Male	3.35
20	Sat	No	Male	4.08
21	Sat	No	Female	2.75
22	Sat	No	Female	2.23
23	Sat	No	Male	7.58
24	Sat	No	Male	3.18
25	Sat	No	Male	2.34
26	Sat	No	Male	2.00
27	Sat	No	Male	2.00
28	Sat	No	Male	4.30
29	Sat	No	Female	3.00
30	Sat	No	Male	1.45
31	Sat	No	Male	2.50
32	Sat	No	Female	3.00
33	Sat	No	Female	2.45
34	Sat	No	Male	3.27
35	Sat	No	Male	3.60
36	Sat	No	Male	2.00
37	Sat	No	Female	3.07
38	Sat	No	Male	2.31
39	Sat	No	Male	5.00
40	Sat	No	Male	2.24

	day	smoker	gender	tip
41	Sun	No	Male	2.54
42	Sun	No	Male	3.06
43	Sun	No	Male	1.32
44	Sun	No	Male	5.60
45	Sun	No	Male	3.00
46	Sun	No	Male	5.00
47	Sun	No	Male	6.00
48	Sun	No	Male	2.05
49	Sun	No	Male	3.00
50	Sun	No	Male	2.50

In [65]: df

Out[65]:

	total_bill	tip	gender	smoker	day	time	size
pawan	16.99	1.01	Female	No	Sun	Dinner	2
yadav	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 × 7 columns

In [66]: df.rename({'pawan':0,'yadav':1},inplace=True)
df

```
Out[66]:
```

	total_bill	tip	gender	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 × 7 columns

```
In [67]: s=df.total_bill  
type(s)
```

```
Out[67]: pandas.core.series.Series
```

```
In [68]: s.sum()
```

```
Out[68]: 4827.77
```

```
In [69]: df.total_bill.sum()
```

```
Out[69]: 4827.77
```

```
In [70]: df.total_bill.mean()
```

```
Out[70]: 19.78594262295082
```

```
In [71]: df.total_bill.count()
```

```
Out[71]: 244
```

```
In [72]: df.total_bill.min()
```

```
Out[72]: 3.07
```

```
In [74]: df.total_bill.max()
```

```
Out[74]: 50.81
```

```
In [75]: df.total_bill.std()
```

```
Out[75]: 8.902411954856856
```

```
In [76]: df.total_bill.median()
```

Out[76]: 17.795

In [77]: df

Out[77]:

	total_bill	tip	gender	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 × 7 columns

```
In [78]: df.gender.sum()
```

```
In [79]: df.gender.mean()
```

```
ValueError Traceback (most recent call last)
File ~\anaconda3\Lib\site-packages\pandas\core\nanops.py:1630, in _ensure_numeric(x)
    1629     try:
-> 1630         x = float(x)
    1631     except (TypeError, ValueError):
    1632         # e.g. "1+1j" or "foo"
```

During handling of the above exception, another exception occurred:

```
ValueError                                Traceback (most recent call last)
File ~\anaconda3\Lib\site-packages\pandas\core\nanops.py:1634, in _ensure_numeric
(x)
    1633     try:
-> 1634         x = complex(x)
    1635     except ValueError as err:
    1636         # e.g. "foo"
```

ValueError: complex() arg is a malformed string

The above exception was the direct cause of the following exception:

```
TypeError
Cell In[79], line 1
----> 1 df.gender.mean()

File ~\anaconda3\Lib\site-packages\pandas\core\generic.py:11847, in NDFrame._add_numeric_operations.<locals>.mean(self, axis, skipna, level, numeric_only, **kwargs)
    11829 @doc(
    11830     _num_doc,
    11831     desc="Return the mean of the values over the requested axis.",
    (...),
    11845     **kwargs,
    11846 ):
> 11847     return NDFrame.mean(self, axis, skipna, level, numeric_only, **kwargs)

File ~\anaconda3\Lib\site-packages\pandas\core\generic.py:11401, in NDFrame.mean(self, axis, skipna, level, numeric_only, **kwargs)
    11393 def mean(
    11394     self,
    11395     axis: Axis | None | lib.NoDefault = lib.no_default,
    (...),
    11399     **kwargs,
    11400 ) -> Series | float:
> 11401     return self._stat_function(
    11402         "mean", nanops.nanmean, axis, skipna, level, numeric_only, **kwargs)
```

```
11403     )
File ~\anaconda3\Lib\site-packages\pandas\core\generic.py:11353, in NDFrame._stat_
function(self, name, func, axis, skipna, level, numeric_only, **kwargs)
    11343     warnings.warn(
    11344         "Using the level keyword in DataFrame and Series aggregations is "
    11345         "deprecated and will be removed in a future version. Use groupby"
    (...),
    11348     stacklevel=find_stack_level(),
    11349 )
    11350     return self._agg_by_level(
    11351         name, axis=axis, level=level, skipna=skipna, numeric_only=numeric_
only
    11352     )
-> 11353 return self._reduce(
    11354     func, name=name, axis=axis, skipna=skipna, numeric_only=numeric_only
    11355 )

File ~\anaconda3\Lib\site-packages\pandas\core\series.py:4816, in Series._reduce(s
elf, op, name, axis, skipna, numeric_only, filter_type, **kwds)
    4812     raise NotImplementedError(
    4813         f"Series.{name} does not implement {kwd_name}."
    4814     )
    4815 with np.errstate(all="ignore"):
-> 4816     return op(delegate, skipna=skipna, **kwds)

File ~\anaconda3\Lib\site-packages\pandas\core\nanops.py:93, in disallow.__call__.
<locals>._f(*args, **kwargs)
    91 try:
    92     with np.errstate(invalid="ignore"):
---> 93         return f(*args, **kwargs)
    94 except ValueError as e:
    95     # we want to transform an object array
    96     # ValueError message to the more typical TypeError
    97     # e.g. this is normally a disallowed function on
    98     # object arrays that contain strings
    99     if is_object_dtype(args[0]):


File ~\anaconda3\Lib\site-packages\pandas\core\nanops.py:155, in bottleneck_switc
h.__call__.locals.f(values, axis, skipna, **kwds)
    153     result = alt(values, axis=axis, skipna=skipna, **kwds)
    154 else:
--> 155     result = alt(values, axis=axis, skipna=skipna, **kwds)
    157 return result


File ~\anaconda3\Lib\site-packages\pandas\core\nanops.py:418, in _datetimelike_com
pat.locals.new_func(values, axis, skipna, mask, **kwargs)
    415 if datetimelike and mask is None:
    416     mask = isna(values)
--> 418 result = func(values, axis=axis, skipna=skipna, mask=mask, **kwargs)
    420 if datetimelike:
    421     result = _wrap_results(result, orig_values.dtype, fill_value=iNaT)


File ~\anaconda3\Lib\site-packages\pandas\core\nanops.py:706, in nanmean(values, a
xis, skipna, mask)
    703     dtype_count = dtype
    705 count = _get_counts(values.shape, mask, axis, dtype=dtype_count)
--> 706 the_sum = _ensure_numeric(values.sum(axis, dtype=dtype_sum))
    708 if axis is not None and getattr(the_sum, "ndim", False):
    709     count = cast(np.ndarray, count)


File ~\anaconda3\Lib\site-packages\pandas\core\nanops.py:1637, in _ensure_numeric
(x)
    1634     x = complex(x)
```

```
In [80]: df.gender.min()
```

```
Out[80]: 'Female'
```

In [81]: df

Out[81]:		total_bill	tip	gender	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 × 7 columns

```
In [82]: df.gender.unique()
```

```
Out[82]: array(['Female', 'Male'], dtype=object)
```

```
In [83]: df.day.unique()
```

```
Out[83]: array(['Sun', 'Sat', 'Thur', 'Fri'], dtype=object)
```

```
In [84]: df.total_bill.unique()
```

```
Out[84]: array([16.99, 10.34, 21.01, 23.68, 24.59, 25.29, 8.77, 26.88, 15.04,
   14.78, 10.27, 35.26, 15.42, 18.43, 14.83, 21.58, 10.33, 16.29,
   16.97, 20.65, 17.92, 20.29, 15.77, 39.42, 19.82, 17.81, 13.37,
   12.69, 21.7 , 19.65, 9.55, 18.35, 15.06, 20.69, 17.78, 24.06,
   16.31, 16.93, 18.69, 31.27, 16.04, 17.46, 13.94, 9.68, 30.4 ,
   18.29, 22.23, 32.4 , 28.55, 18.04, 12.54, 10.29, 34.81, 9.94,
   25.56, 19.49, 38.01, 26.41, 11.24, 48.27, 13.81, 11.02, 17.59,
   20.08, 16.45, 3.07, 20.23, 15.01, 12.02, 17.07, 26.86, 25.28,
   14.73, 10.51, 27.2 , 22.76, 17.29, 19.44, 16.66, 10.07, 32.68,
   15.98, 34.83, 13.03, 18.28, 24.71, 21.16, 28.97, 22.49, 5.75,
   16.32, 22.75, 40.17, 27.28, 12.03, 12.46, 11.35, 15.38, 44.3 ,
   22.42, 20.92, 15.36, 20.49, 25.21, 18.24, 14.31, 14. , 7.25,
   38.07, 23.95, 25.71, 17.31, 29.93, 10.65, 12.43, 24.08, 11.69,
   13.42, 14.26, 15.95, 12.48, 29.8 , 8.52, 14.52, 11.38, 22.82,
   19.08, 20.27, 11.17, 12.26, 18.26, 8.51, 14.15, 16. , 13.16,
   17.47, 34.3 , 41.19, 27.05, 16.43, 8.35, 18.64, 11.87, 9.78,
   7.51, 14.07, 13.13, 17.26, 24.55, 19.77, 29.85, 48.17, 25. ,
   13.39, 16.49, 21.5 , 12.66, 16.21, 17.51, 24.52, 20.76, 31.71,
   10.59, 10.63, 50.81, 15.81, 31.85, 16.82, 32.9 , 17.89, 14.48,
   9.6 , 34.63, 34.65, 23.33, 45.35, 23.17, 40.55, 20.9 , 30.46,
   18.15, 23.1 , 15.69, 19.81, 28.44, 15.48, 16.58, 7.56, 43.11,
   13. , 13.51, 18.71, 12.74, 16.4 , 20.53, 16.47, 26.59, 38.73,
   24.27, 12.76, 30.06, 25.89, 48.33, 13.27, 28.17, 12.9 , 28.15,
   11.59, 7.74, 30.14, 12.16, 8.58, 16.27, 10.09, 20.45, 13.28,
   22.12, 24.01, 11.61, 10.77, 15.53, 12.6 , 32.83, 35.83, 29.03,
   27.18, 22.67, 17.82, 18.78])
```

```
In [85]: df.time.unique()
```

```
Out[85]: array(['Dinner', 'Lunch'], dtype=object)
```

```
In [87]: df.time.value_counts()
```

```
Out[87]: Dinner    176
Lunch      68
Name: time, dtype: int64
```

```
In [88]: df.day.value_counts()
```

```
Out[88]: Sat     87
Sun     76
Thur    62
Fri     19
Name: day, dtype: int64
```

```
In [89]: df.describe()
```

	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

```
In [90]: df.tip.sum()
```

```
Out[90]: 731.5799999999999
```

```
In [91]: df.total_bill.sum()
```

```
Out[91]: 4827.77
```

```
In [93]: df.size.sum()
```

```
Out[93]: 1708
```

```
In [95]: df.describe(include='all')
```

```
Out[95]:
```

	total_bill	tip	gender	smoker	day	time	size
count	244.000000	244.000000	244	244	244	244	244.000000
unique	NaN	NaN	2	2	4	2	NaN
top	NaN	NaN	Male	No	Sat	Dinner	NaN
freq	NaN	NaN	157	151	87	176	NaN
mean	19.785943	2.998279	NaN	NaN	NaN	NaN	2.569672
std	8.902412	1.383638	NaN	NaN	NaN	NaN	0.951100
min	3.070000	1.000000	NaN	NaN	NaN	NaN	1.000000
25%	13.347500	2.000000	NaN	NaN	NaN	NaN	2.000000
50%	17.795000	2.900000	NaN	NaN	NaN	NaN	2.000000
75%	24.127500	3.562500	NaN	NaN	NaN	NaN	3.000000
max	50.810000	10.000000	NaN	NaN	NaN	NaN	6.000000

```
In [96]: df.describe(include='object')
```

```
Out[96]:
```

	gender	smoker	day	time
count	244	244	244	244
unique	2	2	4	2
top	Male	No	Sat	Dinner
freq	157	151	87	176

```
In [ ]:
```