```
# Import data/ Load data
```

```
import pandas as pd
```

```
df = pd.read_csv("tips.csv")
df
```

	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

Next steps: Generate code with df View recommended plots New interactive sheet

```
pd.set_option("display.max_rows", None)
```

```
# First five observations
```

```
df.head()
```

	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

Next steps: Generate code with df View recommended plots New interactive sheet

```
df.tail()
```

	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

```
df.shape
```

```
(244, 7)
```

```
df.size
```

```
1708
```

```
df.columns
```

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

```
df.keys()
```

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

```
df=df.rename(columns={"sex":"gender"})
```

```
df.dtypes
```

	0
total_bill	float64
tip	float64
gender	object
smoker	object
day	object
time	object
size	int64

```
# Concise summary of a DatFrame
```

```
df.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   gender      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
```

```
#Check for missing values
```

```
df.isnull().sum()
```

	0
total_bill	0
tip	0
gender	0
smoker	0
day	0
time	0
size	0

```
# To access the data of a single column
```

```
df.total_bill
```

	total_bill
0	16.99
1	10.34
2	21.01
3	23.68
4	24.59
5	25.29
6	8.77
7	26.88
8	15.04
9	14.78
10	10.27
11	35.26
12	15.42
13	18.43
14	14.83
15	21.58
16	10.33
17	16.29
18	16.97
19	20.65
20	17.92
21	20.29
22	15.77
23	39.42
24	19.82
25	17.81
26	13.37
27	12.69
28	21.70
29	19.65
30	9.55
31	18.35
32	15.06
33	20.69
34	17.78
35	24.06
36	16.31
37	16.93
38	18.69
39	31.27
40	16.04
41	17.46
42	13.94
43	9.68
44	30.40
45	18.29

46	22.23
47	32.40
48	28.55
49	18.04
50	12.54
51	10.29
52	34.81
53	9.94
54	25.56
55	19.49
56	38.01
57	26.41
58	11.24
59	48.27
60	20.29
61	13.81
62	11.02
63	18.29
64	17.59
65	20.08
66	16.45
67	3.07
68	20.23
69	15.01
70	12.02
71	17.07
72	26.86
73	25.28
74	14.73
75	10.51
76	17.92
77	27.20
78	22.76
79	17.29
80	19.44
81	16.66
82	10.07
83	32.68
84	15.98
85	34.83
86	13.03
87	18.28
88	24.71
89	21.16
90	28.97
91	22.49
92	5.75

93	16.32
94	22.75
95	40.17
96	27.28
97	12.03
98	21.01
99	12.46
100	11.35
101	15.38
102	44.30
103	22.42
104	20.92
105	15.36
106	20.49
107	25.21
108	18.24
109	14.31
110	14.00
111	7.25
112	38.07
113	23.95
114	25.71
115	17.31
116	29.93
117	10.65
118	12.43
119	24.08
120	11.69
121	13.42
122	14.26
123	15.95
124	12.48
125	29.80
126	8.52
127	14.52
128	11.38
129	22.82
130	19.08
131	20.27
132	11.17
133	12.26
134	18.26
135	8.51
136	10.33
137	14.15
138	16.00
139	13.16

140	17.47
141	34.30
142	41.19
143	27.05
144	16.43
145	8.35
146	18.64
147	11.87
148	9.78
149	7.51
150	14.07
151	13.13
152	17.26
153	24.55
154	19.77
155	29.85
156	48.17
157	25.00
158	13.39
159	16.49
160	21.50
161	12.66
162	16.21
163	13.81
164	17.51
165	24.52
166	20.76
167	31.71
168	10.59
169	10.63
170	50.81
171	15.81
172	7.25
173	31.85
174	16.82
175	32.90
176	17.89
177	14.48
178	9.60
179	34.63
180	34.65
181	23.33
182	45.35
183	23.17
184	40.55
185	20.69
186	20.90

186	20.90
187	30.46
188	18.15
189	23.10
190	15.69
191	19.81
192	28.44
193	15.48
194	16.58
195	7.56
196	10.34
197	43.11
198	13.00
199	13.51
200	18.71
201	12.74
202	13.00
203	16.40
204	20.53
205	16.47
206	26.59
207	38.73
208	24.27
209	12.76
210	30.06
211	25.89
212	48.33
213	13.27
214	28.17
215	12.90
216	28.15
217	11.59
218	7.74
219	30.14
220	12.16
221	13.42
222	8.58
223	15.98
224	13.42
225	16.27
226	10.09
227	20.45
228	13.28
229	22.12
230	24.01
231	15.69
232	11.61
233	10.77

233	10.77
234	15.53
235	10.07
236	12.60
237	32.83
238	35.83
239	29.03
240	27.18
241	22.67
242	17.82
243	18.78

```
# Convert pandas.series to 1D array
```

```
df['total_bill'].values
```

```
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, 20.29, 13.81, 11.02,
       18.29, 17.59, 20.08, 16.45,  3.07, 20.23, 15.01, 12.02, 17.07,
       26.86, 25.28, 14.73, 10.51, 17.92, 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, 21.01,
       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, 10.33, 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, 13.81, 17.51, 24.52, 20.76, 31.71, 10.59, 10.63, 50.81,
       15.81,  7.25, 31.85, 16.82, 32.9 , 17.89, 14.48,  9.6 , 34.63,
       34.65, 23.33, 45.35, 23.17, 40.55, 20.69, 20.9 , 30.46, 18.15,
       23.1 , 15.69, 19.81, 28.44, 15.48, 16.58,  7.56, 10.34, 43.11,
       13.  , 13.51, 18.71, 12.74, 13.  , 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, 13.42,  8.58, 15.98, 13.42,
       16.27, 10.09, 20.45, 13.28, 22.12, 24.01, 15.69, 11.61, 10.77,
       15.53, 10.07, 12.6 , 32.83, 35.83, 29.03, 27.18, 22.67, 17.82,
       18.78])
```

```
# To access the data of a multiple columns
```

```
df[["total_bill", "gender"]]
```

	total_bill	gender
0	16.99	Female
1	10.34	Male
2	21.01	Male
3	23.68	Male
4	24.59	Female
5	25.29	Male
6	8.77	Male
7	26.88	Male
8	15.04	Male
9	14.78	Male
10	10.27	Male
11	35.26	Female
12	15.42	Male
13	18.43	Male
14	14.83	Female
15	21.58	Male
16	10.33	Female
17	16.29	Male
18	16.97	Female
19	20.65	Male
20	17.92	Male
21	20.29	Female
22	15.77	Female
23	39.42	Male
24	19.82	Male
25	17.81	Male
26	13.37	Male
27	12.69	Male
28	21.70	Male
29	19.65	Female
30	9.55	Male
31	18.35	Male
32	15.06	Female
33	20.69	Female
34	17.78	Male
35	24.06	Male
36	16.31	Male
37	16.93	Female
38	18.69	Male
39	31.27	Male
40	16.04	Male
41	17.46	Male
42	13.94	Male
43	9.68	Male
44	30.40	Male
45	18.29	Male

46	22.23	Male
47	32.40	Male
48	28.55	Male
49	18.04	Male
50	12.54	Male
51	10.29	Female
52	34.81	Female
53	9.94	Male
54	25.56	Male
55	19.49	Male
56	38.01	Male
57	26.41	Female
58	11.24	Male
59	48.27	Male
60	20.29	Male
61	13.81	Male
62	11.02	Male
63	18.29	Male
64	17.59	Male
65	20.08	Male
66	16.45	Female
67	3.07	Female
68	20.23	Male
69	15.01	Male
70	12.02	Male
71	17.07	Female
72	26.86	Female
73	25.28	Female
74	14.73	Female
75	10.51	Male
76	17.92	Male
77	27.20	Male
78	22.76	Male
79	17.29	Male
80	19.44	Male
81	16.66	Male
82	10.07	Female
83	32.68	Male
84	15.98	Male
85	34.83	Female
86	13.03	Male
87	18.28	Male
88	24.71	Male
89	21.16	Male
90	28.97	Male
91	22.49	Male
92	5.75	Female

93	16.32	Female
94	22.75	Female
95	40.17	Male
96	27.28	Male
97	12.03	Male
98	21.01	Male
99	12.46	Male
100	11.35	Female
101	15.38	Female
102	44.30	Female
103	22.42	Female
104	20.92	Female
105	15.36	Male
106	20.49	Male
107	25.21	Male
108	18.24	Male
109	14.31	Female
110	14.00	Male
111	7.25	Female
112	38.07	Male
113	23.95	Male
114	25.71	Female
115	17.31	Female
116	29.93	Male
117	10.65	Female
118	12.43	Female
119	24.08	Female
120	11.69	Male
121	13.42	Female
122	14.26	Male
123	15.95	Male
124	12.48	Female
125	29.80	Female
126	8.52	Male
127	14.52	Female
128	11.38	Female
129	22.82	Male
130	19.08	Male
131	20.27	Female
132	11.17	Female
133	12.26	Female
134	18.26	Female
135	8.51	Female
136	10.33	Female
137	14.15	Female
138	16.00	Male
139	13.16	Female

140	17.47	Female
141	34.30	Male
142	41.19	Male
143	27.05	Female
144	16.43	Female
145	8.35	Female
146	18.64	Female
147	11.87	Female
148	9.78	Male
149	7.51	Male
150	14.07	Male
151	13.13	Male
152	17.26	Male
153	24.55	Male
154	19.77	Male
155	29.85	Female
156	48.17	Male
157	25.00	Female
158	13.39	Female
159	16.49	Male
160	21.50	Male
161	12.66	Male
162	16.21	Female
163	13.81	Male
164	17.51	Female
165	24.52	Male
166	20.76	Male
167	31.71	Male
168	10.59	Female
169	10.63	Female
170	50.81	Male
171	15.81	Male
172	7.25	Male
173	31.85	Male
174	16.82	Male
175	32.90	Male
176	17.89	Male
177	14.48	Male
178	9.60	Female
179	34.63	Male
180	34.65	Male
181	23.33	Male
182	45.35	Male
183	23.17	Male
184	40.55	Male
185	20.69	Male

186	20.90	Female
187	30.46	Male
188	18.15	Female
189	23.10	Male
190	15.69	Male
191	19.81	Female
192	28.44	Male
193	15.48	Male
194	16.58	Male
195	7.56	Male
196	10.34	Male
197	43.11	Female
198	13.00	Female
199	13.51	Male
200	18.71	Male
201	12.74	Female
202	13.00	Female
203	16.40	Female
204	20.53	Male
205	16.47	Female
206	26.59	Male
207	38.73	Male
208	24.27	Male
209	12.76	Female
210	30.06	Male
211	25.89	Male
212	48.33	Male
213	13.27	Female
214	28.17	Female
215	12.90	Female
216	28.15	Male
217	11.59	Male
218	7.74	Male
219	30.14	Female
220	12.16	Male
221	13.42	Female
222	8.58	Male
223	15.98	Female
224	13.42	Male
225	16.27	Female
226	10.09	Female
227	20.45	Male
228	13.28	Male
229	22.12	Female
230	24.01	Male
231	15.69	Male
232	11.61	Male
233	10.77	Male

233	10.77	Male
234	15.53	Male
235	10.07	Male
236	12.60	Male
237	32.83	Male
238	35.83	Female
239	29.03	Male
240	27.18	Female
241	22.67	Male
242	17.82	Male

```
# Selecting databy using iloc
```

```
df.iloc[0,2]
```

```
df.iloc[0:5,2]
```

	gender
0	Female
1	Male
2	Male
3	Male
4	Female

```
df.iloc[[4,10,16,22],[2,3]]
```

	gender	smoker
4	Female	No
10	Male	No
16	Female	No

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

	total_bill
0	16.99
1	10.34
2	21.01
3	23.68
4	24.59
5	25.29
6	8.77
7	26.88
8	15.04
9	14.78
10	10.27
11	35.26
12	15.42
13	18.43
14	14.83
15	21.58
16	10.33
17	16.29
18	16.97
19	20.65
20	17.92
21	20.29
22	15.77
23	39.42
24	19.82
25	17.81
26	13.37
27	12.69
28	21.70
29	19.65
30	9.55
31	18.35
32	15.06
33	20.69
34	17.78
35	24.06
36	16.31
37	16.93
38	18.69
39	31.27
40	16.04
41	17.46
42	13.94
43	9.68
44	30.40
45	18.29

46	22.23
47	32.40
48	28.55
49	18.04
50	12.54
51	10.29
52	34.81
53	9.94
54	25.56
55	19.49
56	38.01
57	26.41
58	11.24
59	48.27
60	20.29
61	13.81
62	11.02
63	18.29
64	17.59
65	20.08
66	16.45
67	3.07
68	20.23
69	15.01
70	12.02
71	17.07
72	26.86
73	25.28
74	14.73
75	10.51
76	17.92
77	27.20
78	22.76
79	17.29
80	19.44
81	16.66
82	10.07
83	32.68
84	15.98
85	34.83
86	13.03
87	18.28
88	24.71
89	21.16
90	28.97
91	22.49
92	5.75

93	16.32
94	22.75
95	40.17
96	27.28
97	12.03
98	21.01
99	12.46
100	11.35
101	15.38
102	44.30
103	22.42
104	20.92
105	15.36
106	20.49
107	25.21
108	18.24
109	14.31
110	14.00
111	7.25
112	38.07
113	23.95
114	25.71
115	17.31
116	29.93
117	10.65
118	12.43
119	24.08
120	11.69
121	13.42
122	14.26
123	15.95
124	12.48
125	29.80
126	8.52
127	14.52
128	11.38
129	22.82
130	19.08
131	20.27
132	11.17
133	12.26
134	18.26
135	8.51
136	10.33
137	14.15
138	16.00
139	13.16

140	17.47
141	34.30
142	41.19
143	27.05
144	16.43
145	8.35
146	18.64
147	11.87
148	9.78
149	7.51
150	14.07
151	13.13
152	17.26
153	24.55
154	19.77
155	29.85
156	48.17
157	25.00
158	13.39
159	16.49
160	21.50
161	12.66
162	16.21
163	13.81
164	17.51
165	24.52
166	20.76
167	31.71
168	10.59
169	10.63
170	50.81
171	15.81
172	7.25
173	31.85
174	16.82
175	32.90
176	17.89
177	14.48
178	9.60
179	34.63
180	34.65
181	23.33
182	45.35
183	23.17
184	40.55
185	20.69
186	20.90

186	20.90
187	30.46
188	18.15
189	23.10
190	15.69
191	19.81
192	28.44
193	15.48
194	16.58
195	7.56
196	10.34
197	43.11
198	13.00
199	13.51
200	18.71
201	12.74
202	13.00
203	16.40
204	20.53
205	16.47
206	26.59
207	38.73
208	24.27
209	12.76
210	30.06
211	25.89
212	48.33
213	13.27
214	28.17
215	12.90
216	28.15
217	11.59
218	7.74
219	30.14
220	12.16
221	13.42
222	8.58
223	15.98
224	13.42
225	16.27
226	10.09
227	20.45
228	13.28
229	22.12
230	24.01
231	15.69
232	11.61
233	19.77

233	10.77
234	15.53
235	10.07
236	12.60
237	32.83
238	35.83
239	29.03
240	27.18
241	22.67
242	17.82
243	18.78

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

	total_bill
0	16.99
1	10.34
2	21.01
3	23.68
4	24.59
5	25.29
6	8.77
7	26.88
8	15.04
9	14.78
10	10.27
11	35.26
12	15.42
13	18.43
14	14.83
15	21.58
16	10.33
17	16.29
18	16.97
19	20.65
20	17.92
21	20.29
22	15.77
23	39.42
24	19.82
25	17.81
26	13.37
27	12.69
28	21.70
29	19.65
30	9.55
31	18.35
32	15.06
33	20.69
34	17.78
35	24.06
36	16.31
37	16.93
38	18.69
39	31.27
40	16.04
41	17.46
42	13.94
43	9.68
44	30.40
45	18.29

46	22.23
47	32.40
48	28.55
49	18.04
50	12.54
51	10.29
52	34.81
53	9.94
54	25.56
55	19.49
56	38.01
57	26.41
58	11.24
59	48.27
60	20.29
61	13.81
62	11.02
63	18.29
64	17.59
65	20.08
66	16.45
67	3.07
68	20.23
69	15.01
70	12.02
71	17.07
72	26.86
73	25.28
74	14.73
75	10.51
76	17.92
77	27.20
78	22.76
79	17.29
80	19.44
81	16.66
82	10.07
83	32.68
84	15.98
85	34.83
86	13.03
87	18.28
88	24.71
89	21.16
90	28.97
91	22.49
92	5.75

93	16.32
94	22.75
95	40.17
96	27.28
97	12.03
98	21.01
99	12.46
100	11.35
101	15.38
102	44.30
103	22.42
104	20.92
105	15.36
106	20.49
107	25.21
108	18.24
109	14.31
110	14.00
111	7.25
112	38.07
113	23.95
114	25.71
115	17.31
116	29.93
117	10.65
118	12.43
119	24.08
120	11.69
121	13.42
122	14.26
123	15.95
124	12.48
125	29.80
126	8.52
127	14.52
128	11.38
129	22.82
130	19.08
131	20.27
132	11.17
133	12.26
134	18.26
135	8.51
136	10.33
137	14.15
138	16.00
139	13.16

140	17.47
141	34.30
142	41.19
143	27.05
144	16.43
145	8.35
146	18.64
147	11.87
148	9.78
149	7.51
150	14.07
151	13.13
152	17.26
153	24.55
154	19.77
155	29.85
156	48.17
157	25.00
158	13.39
159	16.49
160	21.50
161	12.66
162	16.21
163	13.81
164	17.51
165	24.52
166	20.76
167	31.71
168	10.59
169	10.63
170	50.81
171	15.81
172	7.25
173	31.85
174	16.82
175	32.90
176	17.89
177	14.48
178	9.60
179	34.63
180	34.65
181	23.33
182	45.35
183	23.17
184	40.55
185	20.69
186	20.90

186	20.90
187	30.46
188	18.15
189	23.10
190	15.69
191	19.81
192	28.44
193	15.48
194	16.58
195	7.56
196	10.34
197	43.11
198	13.00
199	13.51
200	18.71
201	12.74
202	13.00
203	16.40
204	20.53
205	16.47
206	26.59
207	38.73
208	24.27
209	12.76
210	30.06
211	25.89
212	48.33
213	13.27
214	28.17
215	12.90
216	28.15
217	11.59
218	7.74
219	30.14
220	12.16
221	13.42
222	8.58
223	15.98
224	13.42
225	16.27
226	10.09
227	20.45
228	13.28
229	22.12
230	24.01
231	15.69
232	11.61
233	19.77

233	10.77
234	15.53
235	10.07
236	12.60
237	32.83
238	35.83
239	29.03
240	27.18
241	22.67
242	17.82
243	18.78

```
df.iloc[:,[2,3]]
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	gender	smoker
0	Female	No
1	Male	No
2	Male	No
3	Male	No
4	Female	No
5	Male	No
6	Male	No
7	Male	No
8	Male	No
9	Male	No
10	Male	No
11	Female	No
12	Male	No
13	Male	No
14	Female	No
15	Male	No
16	Female	No
17	Male	No
18	Female	No
19	Male	No
20	Male	No
21	Female	No
22	Female	No
23	Male	No
24	Male	No
25	Male	No
26	Male	No
27	Male	No
28	Male	No
29	Female	No
30	Male	No
31	Male	No
32	Female	No
33	Female	No
34	Male	No
35	Male	No
36	Male	No
37	Female	No
38	Male	No
39	Male	No
40	Male	No
41	Male	No
42	Male	No
43	Male	No
44	Male	No
45	Male	No

46	Male	No
47	Male	No
48	Male	No
49	Male	No
50	Male	No
51	Female	No
52	Female	No
53	Male	No
54	Male	No
55	Male	No
56	Male	Yes
57	Female	No
58	Male	Yes
59	Male	No
60	Male	Yes
61	Male	Yes
62	Male	Yes
63	Male	Yes
64	Male	No
65	Male	No
66	Female	No
67	Female	Yes
68	Male	No
69	Male	Yes
70	Male	No
71	Female	No
72	Female	Yes
73	Female	Yes
74	Female	No
75	Male	No
76	Male	Yes
77	Male	No
78	Male	No
79	Male	No
80	Male	Yes
81	Male	No
82	Female	No
83	Male	Yes
84	Male	No
85	Female	No
86	Male	No
87	Male	No
88	Male	No
89	Male	No
90	Male	Yes
91	Male	No
92	Female	Yes

93	Female	Yes
94	Female	No
95	Male	Yes
96	Male	Yes
97	Male	Yes
98	Male	Yes
99	Male	No
100	Female	Yes
101	Female	Yes
102	Female	Yes
103	Female	Yes
104	Female	No
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110	Male	No
111	Female	No
112	Male	No
113	Male	No
114	Female	No
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116	Male	No
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132	Female	No
133	Female	No
134	Female	No
135	Female	No
136	Female	No
137	Female	No
138	Male	Yes
139	Female	No

140	Female	No
141	Male	No
142	Male	No
143	Female	No
144	Female	No
145	Female	No
146	Female	No
147	Female	No
148	Male	No
149	Male	No
150	Male	No
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156	Male	No
157	Female	No
158	Female	No
159	Male	No
160	Male	No
161	Male	No
162	Female	No
163	Male	No
164	Female	Yes
165	Male	No
166	Male	No
167	Male	No
168	Female	Yes
169	Female	Yes
170	Male	Yes
171	Male	Yes
172	Male	Yes
173	Male	Yes
174	Male	Yes
175	Male	Yes
176	Male	Yes
177	Male	Yes
178	Female	Yes
179	Male	Yes
180	Male	Yes
181	Male	Yes
182	Male	Yes
183	Male	Yes
184	Male	Yes
185	Male	No

186	Female	Yes
187	Male	Yes
188	Female	Yes
189	Male	Yes
190	Male	Yes
191	Female	Yes
192	Male	Yes
193	Male	Yes
194	Male	Yes
195	Male	No
196	Male	Yes
197	Female	Yes
198	Female	Yes
199	Male	Yes
200	Male	Yes
201	Female	Yes
202	Female	Yes
203	Female	Yes
204	Male	Yes
205	Female	Yes
206	Male	Yes
207	Male	Yes
208	Male	Yes
209	Female	Yes
210	Male	Yes
211	Male	Yes
212	Male	No
213	Female	Yes
214	Female	Yes
215	Female	Yes
216	Male	Yes
217	Male	Yes
218	Male	Yes
219	Female	Yes
220	Male	Yes
221	Female	Yes
222	Male	Yes
223	Female	No
224	Male	Yes
225	Female	Yes
226	Female	Yes
227	Male	No
228	Male	No
229	Female	Yes
230	Male	Yes
231	Male	Yes
232	Male	No

233	Male	No
234	Male	Yes
235	Male	No
236	Male	Yes
237	Male	Yes
238	Female	No
239	Male	No
240	Female	Yes
241	Male	Yes
242	Male	No

```
df.loc[[4,10,16,22],["gender","smoker"]]
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	gender	smoker
4	Female	No
10	Male	No
16	Female	No

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df.loc[:,"total_bill"]
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	total_bill
0	16.99
1	10.34
2	21.01
3	23.68
4	24.59
5	25.29
6	8.77
7	26.88
8	15.04
9	14.78
10	10.27
11	35.26
12	15.42
13	18.43
14	14.83
15	21.58
16	10.33
17	16.29
18	16.97
19	20.65
20	17.92
21	20.29
22	15.77
23	39.42
24	19.82
25	17.81
26	13.37
27	12.69
28	21.70
29	19.65
30	9.55
31	18.35
32	15.06
33	20.69
34	17.78
35	24.06
36	16.31
37	16.93
38	18.69
39	31.27
40	16.04
41	17.46
42	13.94
43	9.68
44	30.40
45	18.29

46	22.23
47	32.40
48	28.55
49	18.04
50	12.54
51	10.29
52	34.81
53	9.94
54	25.56
55	19.49
56	38.01
57	26.41
58	11.24
59	48.27
60	20.29
61	13.81
62	11.02
63	18.29
64	17.59
65	20.08
66	16.45
67	3.07
68	20.23
69	15.01
70	12.02
71	17.07
72	26.86
73	25.28
74	14.73
75	10.51
76	17.92
77	27.20
78	22.76
79	17.29
80	19.44
81	16.66
82	10.07
83	32.68
84	15.98
85	34.83
86	13.03
87	18.28
88	24.71
89	21.16
90	28.97
91	22.49
92	5.75

93	16.32
94	22.75
95	40.17
96	27.28
97	12.03
98	21.01
99	12.46
100	11.35
101	15.38
102	44.30
103	22.42
104	20.92
105	15.36
106	20.49
107	25.21
108	18.24
109	14.31
110	14.00
111	7.25
112	38.07
113	23.95
114	25.71
115	17.31
116	29.93
117	10.65
118	12.43
119	24.08
120	11.69
121	13.42
122	14.26
123	15.95
124	12.48
125	29.80
126	8.52
127	14.52
128	11.38
129	22.82
130	19.08
131	20.27
132	11.17
133	12.26
134	18.26
135	8.51
136	10.33
137	14.15
138	16.00
139	13.16

140	17.47
141	34.30
142	41.19
143	27.05
144	16.43
145	8.35
146	18.64
147	11.87
148	9.78
149	7.51
150	14.07
151	13.13
152	17.26
153	24.55
154	19.77
155	29.85
156	48.17
157	25.00
158	13.39
159	16.49
160	21.50
161	12.66
162	16.21
163	13.81
164	17.51
165	24.52
166	20.76
167	31.71
168	10.59
169	10.63
170	50.81
171	15.81
172	7.25
173	31.85
174	16.82
175	32.90
176	17.89
177	14.48
178	9.60
179	34.63
180	34.65
181	23.33
182	45.35
183	23.17
184	40.55
185	20.69
186	20.90

186	20.90
187	30.46
188	18.15
189	23.10
190	15.69
191	19.81
192	28.44
193	15.48
194	16.58
195	7.56
196	10.34
197	43.11
198	13.00
199	13.51
200	18.71
201	12.74
202	13.00
203	16.40
204	20.53
205	16.47
206	26.59
207	38.73
208	24.27
209	12.76
210	30.06
211	25.89
212	48.33
213	13.27
214	28.17
215	12.90
216	28.15
217	11.59
218	7.74
219	30.14
220	12.16
221	13.42
222	8.58
223	15.98
224	13.42
225	16.27
226	10.09
227	20.45
228	13.28
229	22.12
230	24.01
231	15.69
232	11.61
233	10.77

233	10.77
234	15.53
235	10.07
236	12.60
237	32.83
238	35.83
239	29.03
240	27.18
241	22.67
242	17.82
243	18.78

```
#Filtering 1 selecting/extracting data based on conditions
```

```
df[df["gender"] == "Male"]
```

	total_bill	tip	gender	smoker	day	time	size
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
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
12	15.42	1.57	Male	No	Sun	Dinner	2
13	18.43	3.00	Male	No	Sun	Dinner	4
15	21.58	3.92	Male	No	Sun	Dinner	2
17	16.29	3.71	Male	No	Sun	Dinner	3
19	20.65	3.35	Male	No	Sat	Dinner	3
20	17.92	4.08	Male	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
30	9.55	1.45	Male	No	Sat	Dinner	2
31	18.35	2.50	Male	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
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
50	12.54	2.50	Male	No	Sun	Dinner	2
53	9.94	1.56	Male	No	Sun	Dinner	2
54	25.56	4.34	Male	No	Sun	Dinner	4
55	19.49	3.51	Male	No	Sun	Dinner	2
56	38.01	3.00	Male	Yes	Sat	Dinner	4
58	11.24	1.76	Male	Yes	Sat	Dinner	2
59	48.27	6.73	Male	No	Sat	Dinner	4
60	20.29	3.21	Male	Yes	Sat	Dinner	2

61	13.81	2.00	Male	Yes	Sat	Dinner	2
62	11.02	1.98	Male	Yes	Sat	Dinner	2
63	18.29	3.76	Male	Yes	Sat	Dinner	4
64	17.59	2.64	Male	No	Sat	Dinner	3
65	20.08	3.15	Male	No	Sat	Dinner	3
68	20.23	2.01	Male	No	Sat	Dinner	2
69	15.01	2.09	Male	Yes	Sat	Dinner	2
70	12.02	1.97	Male	No	Sat	Dinner	2
75	10.51	1.25	Male	No	Sat	Dinner	2
76	17.92	3.08	Male	Yes	Sat	Dinner	2
77	27.20	4.00	Male	No	Thur	Lunch	4
78	22.76	3.00	Male	No	Thur	Lunch	2
79	17.29	2.71	Male	No	Thur	Lunch	2
80	19.44	3.00	Male	Yes	Thur	Lunch	2
81	16.66	3.40	Male	No	Thur	Lunch	2
83	32.68	5.00	Male	Yes	Thur	Lunch	2
84	15.98	2.03	Male	No	Thur	Lunch	2
86	13.03	2.00	Male	No	Thur	Lunch	2
87	18.28	4.00	Male	No	Thur	Lunch	2
88	24.71	5.85	Male	No	Thur	Lunch	2
89	21.16	3.00	Male	No	Thur	Lunch	2
90	28.97	3.00	Male	Yes	Fri	Dinner	2
91	22.49	3.50	Male	No	Fri	Dinner	2
95	40.17	4.73	Male	Yes	Fri	Dinner	4
96	27.28	4.00	Male	Yes	Fri	Dinner	2
97	12.03	1.50	Male	Yes	Fri	Dinner	2
98	21.01	3.00	Male	Yes	Fri	Dinner	2
99	12.46	1.50	Male	No	Fri	Dinner	2
105	15.36	1.64	Male	Yes	Sat	Dinner	2
106	20.49	4.06	Male	Yes	Sat	Dinner	2
107	25.21	4.29	Male	Yes	Sat	Dinner	2
108	18.24	3.76	Male	No	Sat	Dinner	2
110	14.00	3.00	Male	No	Sat	Dinner	2
112	38.07	4.00	Male	No	Sun	Dinner	3
113	23.95	2.55	Male	No	Sun	Dinner	2
116	29.93	5.07	Male	No	Sun	Dinner	4
120	11.69	2.31	Male	No	Thur	Lunch	2
122	14.26	2.50	Male	No	Thur	Lunch	2
123	15.95	2.00	Male	No	Thur	Lunch	2
126	8.52	1.48	Male	No	Thur	Lunch	2
129	22.82	2.18	Male	No	Thur	Lunch	3
130	19.08	1.50	Male	No	Thur	Lunch	2
138	16.00	2.00	Male	Yes	Thur	Lunch	2
141	34.30	6.70	Male	No	Thur	Lunch	6
142	41.19	5.00	Male	No	Thur	Lunch	5
148	9.78	1.73	Male	No	Thur	Lunch	2
149	7.51	2.00	Male	No	Thur	Lunch	2

150	14.07	2.50	Male	No	Sun	Dinner	2
151	13.13	2.00	Male	No	Sun	Dinner	2
152	17.26	2.74	Male	No	Sun	Dinner	3
153	24.55	2.00	Male	No	Sun	Dinner	4
154	19.77	2.00	Male	No	Sun	Dinner	4
156	48.17	5.00	Male	No	Sun	Dinner	6
159	16.49	2.00	Male	No	Sun	Dinner	4
160	21.50	3.50	Male	No	Sun	Dinner	4
161	12.66	2.50	Male	No	Sun	Dinner	2
163	13.81	2.00	Male	No	Sun	Dinner	2
165	24.52	3.48	Male	No	Sun	Dinner	3
166	20.76	2.24	Male	No	Sun	Dinner	2
167	31.71	4.50	Male	No	Sun	Dinner	4
170	50.81	10.00	Male	Yes	Sat	Dinner	3
171	15.81	3.16	Male	Yes	Sat	Dinner	2
172	7.25	5.15	Male	Yes	Sun	Dinner	2
173	31.85	3.18	Male	Yes	Sun	Dinner	2
174	16.82	4.00	Male	Yes	Sun	Dinner	2
175	32.90	3.11	Male	Yes	Sun	Dinner	2
176	17.89	2.00	Male	Yes	Sun	Dinner	2
177	14.48	2.00	Male	Yes	Sun	Dinner	2
179	34.63	3.55	Male	Yes	Sun	Dinner	2
180	34.65	3.68	Male	Yes	Sun	Dinner	4
181	23.33	5.65	Male	Yes	Sun	Dinner	2
182	45.35	3.50	Male	Yes	Sun	Dinner	3
183	23.17	6.50	Male	Yes	Sun	Dinner	4
184	40.55	3.00	Male	Yes	Sun	Dinner	2
185	20.69	5.00	Male	No	Sun	Dinner	5
187	30.46	2.00	Male	Yes	Sun	Dinner	5
189	23.10	4.00	Male	Yes	Sun	Dinner	3
190	15.69	1.50	Male	Yes	Sun	Dinner	2
192	28.44	2.56	Male	Yes	Thur	Lunch	2
193	15.48	2.02	Male	Yes	Thur	Lunch	2
194	16.58	4.00	Male	Yes	Thur	Lunch	2
195	7.56	1.44	Male	No	Thur	Lunch	2
196	10.34	2.00	Male	Yes	Thur	Lunch	2
199	13.51	2.00	Male	Yes	Thur	Lunch	2
200	18.71	4.00	Male	Yes	Thur	Lunch	3
204	20.53	4.00	Male	Yes	Thur	Lunch	4
206	26.59	3.41	Male	Yes	Sat	Dinner	3
207	38.73	3.00	Male	Yes	Sat	Dinner	4
208	24.27	2.03	Male	Yes	Sat	Dinner	2
210	30.06	2.00	Male	Yes	Sat	Dinner	3
211	25.89	5.16	Male	Yes	Sat	Dinner	4
212	48.33	9.00	Male	No	Sat	Dinner	4
216	28.15	3.00	Male	Yes	Sat	Dinner	5
217	11.59	1.50	Male	Yes	Sat	Dinner	2

218	7.74	1.44	Male	Yes	Sat	Dinner	2
220	12.16	2.20	Male	Yes	Fri	Lunch	2
222	8.58	1.92	Male	Yes	Fri	Lunch	1
224	13.42	1.58	Male	Yes	Fri	Lunch	2
227	20.45	3.00	Male	No	Sat	Dinner	4
228	13.28	2.72	Male	No	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
239	29.03	5.92	Male	No	Sat	Dinner	3
241	22.67	2.00	Male	Yes	Sat	Dinner	2

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df[(df['tip']>=7)]
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	total_bill	tip	gender	smoker	day	time	size
23	39.42	7.58	Male	No	Sat	Dinner	4
170	50.81	10.00	Male	Yes	Sat	Dinner	3