

```
In [126... import pandas as pd
```

```
In [ ]:
```

```
In [127... a=pd.read_excel(r"C:\Users\USER\OneDrive\Documents\automobile_data .xlsx")
```

```
In [ ]:
```

```
In [128... a
```

Out[128... **make** **fuel_type** **num_of_doors** **body_style** **drive_wheels** **engine_location** **wheel_base**

0	alfa-romero	gas	two	convertible	rwd	front	88.6
1	alfa-romero	gas	two	convertible	rwd	front	88.6
2	alfa-romero	gas	two	hatchback	rwd	front	94.5
3	audi	gas	four	sedan	fwd	front	99.8
4	audi	gas	four	sedan	4wd	front	99.8
...
198	volvo	gas	four	sedan	rwd	front	105.9
199	volvo	gas	four	sedan	rwd	front	105.9
200	volvo	gas	four	sedan	rwd	front	105.9
201	volvo	diesel	four	sedan	rwd	front	105.9
202	volvo	gas	four	sedan	rwd	front	105.9

203 rows × 20 columns



```
In [129... a.info()
```

```
<class 'pandas.core.frame.DataFrame'>
RangeIndex: 203 entries, 0 to 202
Data columns (total 20 columns):
#   Column                Non-Null Count  Dtype
---  -
0   make                   203 non-null   object
1   fuel_type              203 non-null   object
2   num_of_doors           201 non-null   object
3   body_style             203 non-null   object
4   drive_wheels           203 non-null   object
5   engine_location        203 non-null   object
6   wheel_base             203 non-null   float64
7   length                 203 non-null   float64
8   width                  203 non-null   float64
9   height                 203 non-null   float64
10  curb_weight            203 non-null   int64
11  engine_type            203 non-null   object
12  num_of_cylinders       203 non-null   object
13  engine_size            203 non-null   int64
14  fuel_system            203 non-null   object
15  compression_ratio      203 non-null   float64
16  horsepower             203 non-null   int64
17  city_mpg               203 non-null   int64
18  highway_mpg            203 non-null   int64
19  price                  203 non-null   int64
dtypes: float64(5), int64(6), object(9)
memory usage: 31.8+ KB
```

In [130...

a

Out[130...

	make	fuel_type	num_of_doors	body_style	drive_wheels	engine_location	wheel_base
0	alfa-romero	gas	two	convertible	rwd	front	88.4
1	alfa-romero	gas	two	convertible	rwd	front	88.4
2	alfa-romero	gas	two	hatchback	rwd	front	91.3
3	audi	gas	four	sedan	fwd	front	91.4
4	audi	gas	four	sedan	4wd	front	91.4
...
198	volvo	gas	four	sedan	rwd	front	101.3
199	volvo	gas	four	sedan	rwd	front	101.3
200	volvo	gas	four	sedan	rwd	front	101.3
201	volvo	diesel	four	sedan	rwd	front	101.3
202	volvo	gas	four	sedan	rwd	front	101.3

203 rows × 20 columns



In [131...

```
a.duplicated().any()
```

Out[131...

```
np.True_
```

In [132...

```
a
```

Out[132...

	make	fuel_type	num_of_doors	body_style	drive_wheels	engine_location	wheel_base
0	alfa-romero	gas	two	convertible	rwd	front	88.6
1	alfa-romero	gas	two	convertible	rwd	front	88.6
2	alfa-romero	gas	two	hatchback	rwd	front	91.4
3	audi	gas	four	sedan	fwd	front	91.4
4	audi	gas	four	sedan	4wd	front	91.4
...
198	volvo	gas	four	sedan	rwd	front	101.3
199	volvo	gas	four	sedan	rwd	front	101.3
200	volvo	gas	four	sedan	rwd	front	101.3
201	volvo	diesel	four	sedan	rwd	front	101.3
202	volvo	gas	four	sedan	rwd	front	101.3

203 rows × 20 columns



In [133...

```
a.duplicated().sum()
```

Out[133...

np.int64(1)

In [134...

```
a.isna().sum()
```

```
Out[134... make          0
fuel_type      0
num_of_doors   2
body_style     0
drive_wheels   0
engine_location 0
wheel_base     0
length        0
width         0
height        0
curb_weight    0
engine_type    0
num_of_cylinders 0
engine_size    0
fuel_system    0
compression_ratio 0
horsepower     0
city_mpg       0
highway_mpg    0
price         0
dtype: int64
```

```
In [135... #to drop duplicate
a.drop_duplicates()
```

Out[135...

	make	fuel_type	num_of_doors	body_style	drive_wheels	engine_location	wheel_base
0	alfa-romero	gas	two	convertible	rwd	front	88.6
1	alfa-romero	gas	two	convertible	rwd	front	88.6
2	alfa-romero	gas	two	hatchback	rwd	front	91.4
3	audi	gas	four	sedan	fwd	front	91.2
4	audi	gas	four	sedan	4wd	front	91.2
...
198	volvo	gas	four	sedan	rwd	front	101.3
199	volvo	gas	four	sedan	rwd	front	101.3
200	volvo	gas	four	sedan	rwd	front	101.3
201	volvo	diesel	four	sedan	rwd	front	101.3
202	volvo	gas	four	sedan	rwd	front	101.3


202 rows × 20 columns



```
In [136... a[a.duplicated(keep = False)]
```

Out[136...

	make	fuel_type	num_of_doors	body_style	drive_wheels	engine_location	wheel_t
87	mitsubishi	gas	four	sedan	fwd	front	
88	mitsubishi	gas	four	sedan	fwd	front	



In [137...

```
a.drop_duplicates(inplace = True)
```

In [138...

```
pd.set_option('display.max_rows', 202)
```

In [139...

```
a.reset_index(drop = True)
```

Out[139...

	make	fuel_type	num_of_doors	body_style	drive_wheels	engine_location	wheel
0	alfa-romero	gas	two	convertible	rwd	front	
1	alfa-romero	gas	two	convertible	rwd	front	
2	alfa-romero	gas	two	hatchback	rwd	front	
3	audi	gas	four	sedan	fwd	front	
4	audi	gas	four	sedan	4wd	front	
5	audi	gas	two	sedan	fwd	front	
6	audi	gas	four	sedan	fwd	front	
7	audi	gas	four	wagon	fwd	front	
8	audi	gas	four	sedan	fwd	front	
9	audi	gas	two	hatchback	4wd	front	
10	bmw	gas	two	sedan	rwd	front	
11	bmw	gas	four	sedan	rwd	front	
12	bmw	gas	two	sedan	rwd	front	
13	bmw	gas	four	sedan	rwd	front	
14	bmw	gas	four	sedan	rwd	front	
15	bmw	gas	four	sedan	rwd	front	
16	bmw	gas	two	sedan	rwd	front	
17	bmw	gas	four	sedan	rwd	front	
18	chevrolet	gas	two	hatchback	fwd	front	
19	chevrolet	gas	two	hatchback	fwd	front	
20	chevrolet	gas	four	sedan	fwd	front	
21	dodge	gas	two	hatchback	fwd	front	
22	dodge	gas	two	hatchback	fwd	front	
23	dodge	gas	two	hatchback	fwd	front	
24	dodge	gas	four	hatchback	fwd	front	
25	dodge	gas	four	sedan	fwd	front	
26	dodge	gas	four	sedan	fwd	front	
27	dodge	gas	NaN	sedan	fwd	front	
28	dodge	gas	four	wagon	fwd	front	

	make	fuel_type	num_of_doors	body_style	drive_wheels	engine_location	wheel
29	dodge	gas	two	hatchback	fwd	front	
30	honda	gas	two	hatchback	fwd	front	
31	honda	gas	two	hatchback	fwd	front	
32	honda	gas	two	hatchback	fwd	front	
33	honda	gas	two	hatchback	fwd	front	
34	honda	gas	two	hatchback	fwd	front	
35	honda	gas	four	sedan	fwd	front	
36	honda	gas	four	wagon	fwd	front	
37	honda	gas	two	hatchback	fwd	front	
38	honda	gas	two	hatchback	fwd	front	
39	honda	gas	four	sedan	fwd	front	
40	honda	gas	four	sedan	fwd	front	
41	honda	gas	four	sedan	fwd	front	
42	honda	gas	two	sedan	fwd	front	
43	isuzu	gas	four	sedan	rwd	front	
44	isuzu	gas	two	sedan	fwd	front	
45	isuzu	gas	four	sedan	fwd	front	
46	isuzu	gas	two	hatchback	rwd	front	
47	jaguar	gas	four	sedan	rwd	front	
48	jaguar	gas	four	sedan	rwd	front	
49	jaguar	gas	two	sedan	rwd	front	
50	mazda	gas	two	hatchback	fwd	front	
51	mazda	gas	two	hatchback	fwd	front	
52	mazda	gas	two	hatchback	fwd	front	
53	mazda	gas	four	sedan	fwd	front	
54	mazda	gas	four	sedan	fwd	front	
55	mazda	gas	two	hatchback	rwd	front	
56	mazda	gas	two	hatchback	rwd	front	
57	mazda	gas	two	hatchback	rwd	front	
58	mazda	gas	two	hatchback	rwd	front	

	make	fuel_type	num_of_doors	body_style	drive_wheels	engine_location	wheel
59	mazda	gas	two	hatchback	fwd	front	
60	mazda	gas	four	sedan	fwd	front	
61	mazda	gas	two	hatchback	fwd	front	
62	mazda	gas	four	sedan	fwd	front	
63	mazda	diesel	NaN	sedan	fwd	front	
64	mazda	gas	four	hatchback	fwd	front	
65	mazda	gas	four	sedan	rwd	front	
66	mazda	diesel	four	sedan	rwd	front	
67	mercedes-benz	diesel	four	sedan	rwd	front	
68	mercedes-benz	diesel	four	wagon	rwd	front	
69	mercedes-benz	diesel	two	hardtop	rwd	front	
70	mercedes-benz	diesel	four	sedan	rwd	front	
71	mercedes-benz	gas	four	sedan	rwd	front	
72	mercedes-benz	gas	two	convertible	rwd	front	
73	mercedes-benz	gas	four	sedan	rwd	front	
74	mercedes-benz	gas	two	hardtop	rwd	front	
75	mercury	gas	two	hatchback	rwd	front	
76	mitsubishi	gas	two	hatchback	fwd	front	
77	mitsubishi	gas	two	hatchback	fwd	front	
78	mitsubishi	gas	two	hatchback	fwd	front	
79	mitsubishi	gas	two	hatchback	fwd	front	
80	mitsubishi	gas	two	hatchback	fwd	front	
81	mitsubishi	gas	two	hatchback	fwd	front	
82	mitsubishi	gas	two	hatchback	fwd	front	
83	mitsubishi	gas	two	hatchback	fwd	front	
84	mitsubishi	gas	two	hatchback	fwd	front	

	make	fuel_type	num_of_doors	body_style	drive_wheels	engine_location	wheel
85	mitsubishi	gas	four	sedan	fwd	front	
86	mitsubishi	gas	four	sedan	fwd	front	
87	mitsubishi	gas	four	sedan	fwd	front	
88	nissan	gas	two	sedan	fwd	front	
89	nissan	diesel	two	sedan	fwd	front	
90	nissan	gas	two	sedan	fwd	front	
91	nissan	gas	four	sedan	fwd	front	
92	nissan	gas	four	wagon	fwd	front	
93	nissan	gas	two	sedan	fwd	front	
94	nissan	gas	two	hatchback	fwd	front	
95	nissan	gas	four	sedan	fwd	front	
96	nissan	gas	four	wagon	fwd	front	
97	nissan	gas	two	hardtop	fwd	front	
98	nissan	gas	four	hatchback	fwd	front	
99	nissan	gas	four	sedan	fwd	front	
100	nissan	gas	four	sedan	fwd	front	
101	nissan	gas	four	wagon	fwd	front	
102	nissan	gas	four	sedan	fwd	front	
103	nissan	gas	two	hatchback	rwd	front	
104	nissan	gas	two	hatchback	rwd	front	
105	nissan	gas	two	hatchback	rwd	front	
106	peugot	gas	four	sedan	rwd	front	
107	peugot	diesel	four	sedan	rwd	front	
108	peugot	gas	four	wagon	rwd	front	
109	peugot	diesel	four	wagon	rwd	front	
110	peugot	gas	four	sedan	rwd	front	
111	peugot	diesel	four	sedan	rwd	front	
112	peugot	gas	four	wagon	rwd	front	
113	peugot	diesel	four	wagon	rwd	front	
114	peugot	gas	four	sedan	rwd	front	

	make	fuel_type	num_of_doors	body_style	drive_wheels	engine_location	wheel
115	peugot	diesel	four	sedan	rwd	front	
116	peugot	gas	four	sedan	rwd	front	
117	plymouth	gas	two	hatchback	fwd	front	
118	plymouth	gas	two	hatchback	fwd	front	
119	plymouth	gas	four	hatchback	fwd	front	
120	plymouth	gas	four	sedan	fwd	front	
121	plymouth	gas	four	sedan	fwd	front	
122	plymouth	gas	four	wagon	fwd	front	
123	plymouth	gas	two	hatchback	rwd	front	
124	porsche	gas	two	hatchback	rwd	front	
125	porsche	gas	two	hardtop	rwd	rear	
126	porsche	gas	two	hardtop	rwd	rear	
127	porsche	gas	two	convertible	rwd	rear	
128	porsche	gas	two	hatchback	rwd	front	
129	saab	gas	two	hatchback	fwd	front	
130	saab	gas	four	sedan	fwd	front	
131	saab	gas	two	hatchback	fwd	front	
132	saab	gas	four	sedan	fwd	front	
133	saab	gas	two	hatchback	fwd	front	
134	saab	gas	four	sedan	fwd	front	
135	subaru	gas	two	hatchback	fwd	front	
136	subaru	gas	two	hatchback	fwd	front	
137	subaru	gas	two	hatchback	4wd	front	
138	subaru	gas	four	sedan	fwd	front	
139	subaru	gas	four	sedan	fwd	front	
140	subaru	gas	four	sedan	fwd	front	
141	subaru	gas	four	sedan	4wd	front	
142	subaru	gas	four	sedan	4wd	front	
143	subaru	gas	four	wagon	fwd	front	
144	subaru	gas	four	wagon	fwd	front	

	make	fuel_type	num_of_doors	body_style	drive_wheels	engine_location	wheel
145	subaru	gas	four	wagon	4wd	front	
146	subaru	gas	four	wagon	4wd	front	
147	toyota	gas	two	hatchback	fwd	front	
148	toyota	gas	two	hatchback	fwd	front	
149	toyota	gas	four	hatchback	fwd	front	
150	toyota	gas	four	wagon	fwd	front	
151	toyota	gas	four	wagon	4wd	front	
152	toyota	gas	four	wagon	4wd	front	
153	toyota	gas	four	sedan	fwd	front	
154	toyota	gas	four	hatchback	fwd	front	
155	toyota	diesel	four	sedan	fwd	front	
156	toyota	diesel	four	hatchback	fwd	front	
157	toyota	gas	four	sedan	fwd	front	
158	toyota	gas	four	hatchback	fwd	front	
159	toyota	gas	four	sedan	fwd	front	
160	toyota	gas	two	sedan	rwd	front	
161	toyota	gas	two	hatchback	rwd	front	
162	toyota	gas	two	sedan	rwd	front	
163	toyota	gas	two	hatchback	rwd	front	
164	toyota	gas	two	hardtop	rwd	front	
165	toyota	gas	two	hardtop	rwd	front	
166	toyota	gas	two	hatchback	rwd	front	
167	toyota	gas	two	hardtop	rwd	front	
168	toyota	gas	two	hatchback	rwd	front	
169	toyota	gas	two	convertible	rwd	front	
170	toyota	gas	four	sedan	fwd	front	
171	toyota	diesel	four	sedan	fwd	front	
172	toyota	gas	four	hatchback	fwd	front	
173	toyota	gas	four	sedan	fwd	front	
174	toyota	gas	four	hatchback	fwd	front	

	make	fuel_type	num_of_doors	body_style	drive_wheels	engine_location	wheel
175	toyota	gas	two	hatchback	rwd	front	
176	toyota	gas	two	hatchback	rwd	front	
177	toyota	gas	four	sedan	rwd	front	
178	toyota	gas	four	wagon	rwd	front	
179	volkswagen	diesel	two	sedan	fwd	front	
180	volkswagen	gas	two	sedan	fwd	front	
181	volkswagen	diesel	four	sedan	fwd	front	
182	volkswagen	gas	four	sedan	fwd	front	
183	volkswagen	gas	four	sedan	fwd	front	
184	volkswagen	diesel	four	sedan	fwd	front	
185	volkswagen	gas	four	sedan	fwd	front	
186	volkswagen	gas	two	convertible	fwd	front	
187	volkswagen	gas	two	hatchback	fwd	front	
188	volkswagen	gas	four	sedan	fwd	front	
189	volkswagen	diesel	four	sedan	fwd	front	
190	volkswagen	gas	four	wagon	fwd	front	
191	volvo	gas	four	sedan	rwd	front	
192	volvo	gas	four	wagon	rwd	front	
193	volvo	gas	four	sedan	rwd	front	
194	volvo	gas	four	wagon	rwd	front	
195	volvo	gas	four	sedan	rwd	front	
196	volvo	gas	four	wagon	rwd	front	
197	volvo	gas	four	sedan	rwd	front	
198	volvo	gas	four	sedan	rwd	front	
199	volvo	gas	four	sedan	rwd	front	
200	volvo	diesel	four	sedan	rwd	front	
201	volvo	gas	four	sedan	rwd	front	

In [140...

a

Out[140...

	make	fuel_type	num_of_doors	body_style	drive_wheels	engine_location	wheel
0	alfa-romero	gas	two	convertible	rwd	front	
1	alfa-romero	gas	two	convertible	rwd	front	
2	alfa-romero	gas	two	hatchback	rwd	front	
3	audi	gas	four	sedan	fwd	front	
4	audi	gas	four	sedan	4wd	front	
5	audi	gas	two	sedan	fwd	front	
6	audi	gas	four	sedan	fwd	front	
7	audi	gas	four	wagon	fwd	front	
8	audi	gas	four	sedan	fwd	front	
9	audi	gas	two	hatchback	4wd	front	
10	bmw	gas	two	sedan	rwd	front	
11	bmw	gas	four	sedan	rwd	front	
12	bmw	gas	two	sedan	rwd	front	
13	bmw	gas	four	sedan	rwd	front	
14	bmw	gas	four	sedan	rwd	front	
15	bmw	gas	four	sedan	rwd	front	
16	bmw	gas	two	sedan	rwd	front	
17	bmw	gas	four	sedan	rwd	front	
18	chevrolet	gas	two	hatchback	fwd	front	
19	chevrolet	gas	two	hatchback	fwd	front	
20	chevrolet	gas	four	sedan	fwd	front	
21	dodge	gas	two	hatchback	fwd	front	
22	dodge	gas	two	hatchback	fwd	front	
23	dodge	gas	two	hatchback	fwd	front	
24	dodge	gas	four	hatchback	fwd	front	
25	dodge	gas	four	sedan	fwd	front	
26	dodge	gas	four	sedan	fwd	front	
27	dodge	gas	NaN	sedan	fwd	front	
28	dodge	gas	four	wagon	fwd	front	

	make	fuel_type	num_of_doors	body_style	drive_wheels	engine_location	wheel
29	dodge	gas	two	hatchback	fwd	front	
30	honda	gas	two	hatchback	fwd	front	
31	honda	gas	two	hatchback	fwd	front	
32	honda	gas	two	hatchback	fwd	front	
33	honda	gas	two	hatchback	fwd	front	
34	honda	gas	two	hatchback	fwd	front	
35	honda	gas	four	sedan	fwd	front	
36	honda	gas	four	wagon	fwd	front	
37	honda	gas	two	hatchback	fwd	front	
38	honda	gas	two	hatchback	fwd	front	
39	honda	gas	four	sedan	fwd	front	
40	honda	gas	four	sedan	fwd	front	
41	honda	gas	four	sedan	fwd	front	
42	honda	gas	two	sedan	fwd	front	
43	isuzu	gas	four	sedan	rwd	front	
44	isuzu	gas	two	sedan	fwd	front	
45	isuzu	gas	four	sedan	fwd	front	
46	isuzu	gas	two	hatchback	rwd	front	
47	jaguar	gas	four	sedan	rwd	front	
48	jaguar	gas	four	sedan	rwd	front	
49	jaguar	gas	two	sedan	rwd	front	
50	mazda	gas	two	hatchback	fwd	front	
51	mazda	gas	two	hatchback	fwd	front	
52	mazda	gas	two	hatchback	fwd	front	
53	mazda	gas	four	sedan	fwd	front	
54	mazda	gas	four	sedan	fwd	front	
55	mazda	gas	two	hatchback	rwd	front	
56	mazda	gas	two	hatchback	rwd	front	
57	mazda	gas	two	hatchback	rwd	front	
58	mazda	gas	two	hatchback	rwd	front	

	make	fuel_type	num_of_doors	body_style	drive_wheels	engine_location	wheel
59	mazda	gas	two	hatchback	fwd	front	
60	mazda	gas	four	sedan	fwd	front	
61	mazda	gas	two	hatchback	fwd	front	
62	mazda	gas	four	sedan	fwd	front	
63	mazda	diesel	NaN	sedan	fwd	front	
64	mazda	gas	four	hatchback	fwd	front	
65	mazda	gas	four	sedan	rwd	front	
66	mazda	diesel	four	sedan	rwd	front	
67	mercedes-benz	diesel	four	sedan	rwd	front	
68	mercedes-benz	diesel	four	wagon	rwd	front	
69	mercedes-benz	diesel	two	hardtop	rwd	front	
70	mercedes-benz	diesel	four	sedan	rwd	front	
71	mercedes-benz	gas	four	sedan	rwd	front	
72	mercedes-benz	gas	two	convertible	rwd	front	
73	mercedes-benz	gas	four	sedan	rwd	front	
74	mercedes-benz	gas	two	hardtop	rwd	front	
75	mercury	gas	two	hatchback	rwd	front	
76	mitsubishi	gas	two	hatchback	fwd	front	
77	mitsubishi	gas	two	hatchback	fwd	front	
78	mitsubishi	gas	two	hatchback	fwd	front	
79	mitsubishi	gas	two	hatchback	fwd	front	
80	mitsubishi	gas	two	hatchback	fwd	front	
81	mitsubishi	gas	two	hatchback	fwd	front	
82	mitsubishi	gas	two	hatchback	fwd	front	
83	mitsubishi	gas	two	hatchback	fwd	front	
84	mitsubishi	gas	two	hatchback	fwd	front	

	make	fuel_type	num_of_doors	body_style	drive_wheels	engine_location	wheel
85	mitsubishi	gas	four	sedan	fwd	front	
86	mitsubishi	gas	four	sedan	fwd	front	
87	mitsubishi	gas	four	sedan	fwd	front	
89	nissan	gas	two	sedan	fwd	front	
90	nissan	diesel	two	sedan	fwd	front	
91	nissan	gas	two	sedan	fwd	front	
92	nissan	gas	four	sedan	fwd	front	
93	nissan	gas	four	wagon	fwd	front	
94	nissan	gas	two	sedan	fwd	front	
95	nissan	gas	two	hatchback	fwd	front	
96	nissan	gas	four	sedan	fwd	front	
97	nissan	gas	four	wagon	fwd	front	
98	nissan	gas	two	hardtop	fwd	front	
99	nissan	gas	four	hatchback	fwd	front	
100	nissan	gas	four	sedan	fwd	front	
101	nissan	gas	four	sedan	fwd	front	
102	nissan	gas	four	wagon	fwd	front	
103	nissan	gas	four	sedan	fwd	front	
104	nissan	gas	two	hatchback	rwd	front	
105	nissan	gas	two	hatchback	rwd	front	
106	nissan	gas	two	hatchback	rwd	front	
107	peugot	gas	four	sedan	rwd	front	
108	peugot	diesel	four	sedan	rwd	front	
109	peugot	gas	four	wagon	rwd	front	
110	peugot	diesel	four	wagon	rwd	front	
111	peugot	gas	four	sedan	rwd	front	
112	peugot	diesel	four	sedan	rwd	front	
113	peugot	gas	four	wagon	rwd	front	
114	peugot	diesel	four	wagon	rwd	front	
115	peugot	gas	four	sedan	rwd	front	

	make	fuel_type	num_of_doors	body_style	drive_wheels	engine_location	wheel
116	peugot	diesel	four	sedan	rwd	front	
117	peugot	gas	four	sedan	rwd	front	
118	plymouth	gas	two	hatchback	fwd	front	
119	plymouth	gas	two	hatchback	fwd	front	
120	plymouth	gas	four	hatchback	fwd	front	
121	plymouth	gas	four	sedan	fwd	front	
122	plymouth	gas	four	sedan	fwd	front	
123	plymouth	gas	four	wagon	fwd	front	
124	plymouth	gas	two	hatchback	rwd	front	
125	porsche	gas	two	hatchback	rwd	front	
126	porsche	gas	two	hardtop	rwd	rear	
127	porsche	gas	two	hardtop	rwd	rear	
128	porsche	gas	two	convertible	rwd	rear	
129	porsche	gas	two	hatchback	rwd	front	
130	saab	gas	two	hatchback	fwd	front	
131	saab	gas	four	sedan	fwd	front	
132	saab	gas	two	hatchback	fwd	front	
133	saab	gas	four	sedan	fwd	front	
134	saab	gas	two	hatchback	fwd	front	
135	saab	gas	four	sedan	fwd	front	
136	subaru	gas	two	hatchback	fwd	front	
137	subaru	gas	two	hatchback	fwd	front	
138	subaru	gas	two	hatchback	4wd	front	
139	subaru	gas	four	sedan	fwd	front	
140	subaru	gas	four	sedan	fwd	front	
141	subaru	gas	four	sedan	fwd	front	
142	subaru	gas	four	sedan	4wd	front	
143	subaru	gas	four	sedan	4wd	front	
144	subaru	gas	four	wagon	fwd	front	
145	subaru	gas	four	wagon	fwd	front	

	make	fuel_type	num_of_doors	body_style	drive_wheels	engine_location	wheel
146	subaru	gas	four	wagon	4wd	front	
147	subaru	gas	four	wagon	4wd	front	
148	toyota	gas	two	hatchback	fwd	front	
149	toyota	gas	two	hatchback	fwd	front	
150	toyota	gas	four	hatchback	fwd	front	
151	toyota	gas	four	wagon	fwd	front	
152	toyota	gas	four	wagon	4wd	front	
153	toyota	gas	four	wagon	4wd	front	
154	toyota	gas	four	sedan	fwd	front	
155	toyota	gas	four	hatchback	fwd	front	
156	toyota	diesel	four	sedan	fwd	front	
157	toyota	diesel	four	hatchback	fwd	front	
158	toyota	gas	four	sedan	fwd	front	
159	toyota	gas	four	hatchback	fwd	front	
160	toyota	gas	four	sedan	fwd	front	
161	toyota	gas	two	sedan	rwd	front	
162	toyota	gas	two	hatchback	rwd	front	
163	toyota	gas	two	sedan	rwd	front	
164	toyota	gas	two	hatchback	rwd	front	
165	toyota	gas	two	hardtop	rwd	front	
166	toyota	gas	two	hardtop	rwd	front	
167	toyota	gas	two	hatchback	rwd	front	
168	toyota	gas	two	hardtop	rwd	front	
169	toyota	gas	two	hatchback	rwd	front	
170	toyota	gas	two	convertible	rwd	front	
171	toyota	gas	four	sedan	fwd	front	
172	toyota	diesel	four	sedan	fwd	front	
173	toyota	gas	four	hatchback	fwd	front	
174	toyota	gas	four	sedan	fwd	front	
175	toyota	gas	four	hatchback	fwd	front	

	make	fuel_type	num_of_doors	body_style	drive_wheels	engine_location	wheel
176	toyota	gas	two	hatchback	rwd	front	
177	toyota	gas	two	hatchback	rwd	front	
178	toyota	gas	four	sedan	rwd	front	
179	toyota	gas	four	wagon	rwd	front	
180	volkswagen	diesel	two	sedan	fwd	front	
181	volkswagen	gas	two	sedan	fwd	front	
182	volkswagen	diesel	four	sedan	fwd	front	
183	volkswagen	gas	four	sedan	fwd	front	
184	volkswagen	gas	four	sedan	fwd	front	
185	volkswagen	diesel	four	sedan	fwd	front	
186	volkswagen	gas	four	sedan	fwd	front	
187	volkswagen	gas	two	convertible	fwd	front	
188	volkswagen	gas	two	hatchback	fwd	front	
189	volkswagen	gas	four	sedan	fwd	front	
190	volkswagen	diesel	four	sedan	fwd	front	
191	volkswagen	gas	four	wagon	fwd	front	
192	volvo	gas	four	sedan	rwd	front	
193	volvo	gas	four	wagon	rwd	front	
194	volvo	gas	four	sedan	rwd	front	
195	volvo	gas	four	wagon	rwd	front	
196	volvo	gas	four	sedan	rwd	front	
197	volvo	gas	four	wagon	rwd	front	
198	volvo	gas	four	sedan	rwd	front	
199	volvo	gas	four	sedan	rwd	front	
200	volvo	gas	four	sedan	rwd	front	
201	volvo	diesel	four	sedan	rwd	front	
202	volvo	gas	four	sedan	rwd	front	

In []:

In [141...

a

Out[141...

	make	fuel_type	num_of_doors	body_style	drive_wheels	engine_location	wheel
0	alfa-romero	gas	two	convertible	rwd	front	
1	alfa-romero	gas	two	convertible	rwd	front	
2	alfa-romero	gas	two	hatchback	rwd	front	
3	audi	gas	four	sedan	fwd	front	
4	audi	gas	four	sedan	4wd	front	
5	audi	gas	two	sedan	fwd	front	
6	audi	gas	four	sedan	fwd	front	
7	audi	gas	four	wagon	fwd	front	
8	audi	gas	four	sedan	fwd	front	
9	audi	gas	two	hatchback	4wd	front	
10	bmw	gas	two	sedan	rwd	front	
11	bmw	gas	four	sedan	rwd	front	
12	bmw	gas	two	sedan	rwd	front	
13	bmw	gas	four	sedan	rwd	front	
14	bmw	gas	four	sedan	rwd	front	
15	bmw	gas	four	sedan	rwd	front	
16	bmw	gas	two	sedan	rwd	front	
17	bmw	gas	four	sedan	rwd	front	
18	chevrolet	gas	two	hatchback	fwd	front	
19	chevrolet	gas	two	hatchback	fwd	front	
20	chevrolet	gas	four	sedan	fwd	front	
21	dodge	gas	two	hatchback	fwd	front	
22	dodge	gas	two	hatchback	fwd	front	
23	dodge	gas	two	hatchback	fwd	front	
24	dodge	gas	four	hatchback	fwd	front	
25	dodge	gas	four	sedan	fwd	front	
26	dodge	gas	four	sedan	fwd	front	
27	dodge	gas	NaN	sedan	fwd	front	
28	dodge	gas	four	wagon	fwd	front	

	make	fuel_type	num_of_doors	body_style	drive_wheels	engine_location	wheel
29	dodge	gas	two	hatchback	fwd	front	
30	honda	gas	two	hatchback	fwd	front	
31	honda	gas	two	hatchback	fwd	front	
32	honda	gas	two	hatchback	fwd	front	
33	honda	gas	two	hatchback	fwd	front	
34	honda	gas	two	hatchback	fwd	front	
35	honda	gas	four	sedan	fwd	front	
36	honda	gas	four	wagon	fwd	front	
37	honda	gas	two	hatchback	fwd	front	
38	honda	gas	two	hatchback	fwd	front	
39	honda	gas	four	sedan	fwd	front	
40	honda	gas	four	sedan	fwd	front	
41	honda	gas	four	sedan	fwd	front	
42	honda	gas	two	sedan	fwd	front	
43	isuzu	gas	four	sedan	rwd	front	
44	isuzu	gas	two	sedan	fwd	front	
45	isuzu	gas	four	sedan	fwd	front	
46	isuzu	gas	two	hatchback	rwd	front	
47	jaguar	gas	four	sedan	rwd	front	
48	jaguar	gas	four	sedan	rwd	front	
49	jaguar	gas	two	sedan	rwd	front	
50	mazda	gas	two	hatchback	fwd	front	
51	mazda	gas	two	hatchback	fwd	front	
52	mazda	gas	two	hatchback	fwd	front	
53	mazda	gas	four	sedan	fwd	front	
54	mazda	gas	four	sedan	fwd	front	
55	mazda	gas	two	hatchback	rwd	front	
56	mazda	gas	two	hatchback	rwd	front	
57	mazda	gas	two	hatchback	rwd	front	
58	mazda	gas	two	hatchback	rwd	front	

	make	fuel_type	num_of_doors	body_style	drive_wheels	engine_location	wheel
59	mazda	gas	two	hatchback	fwd	front	
60	mazda	gas	four	sedan	fwd	front	
61	mazda	gas	two	hatchback	fwd	front	
62	mazda	gas	four	sedan	fwd	front	
63	mazda	diesel	NaN	sedan	fwd	front	
64	mazda	gas	four	hatchback	fwd	front	
65	mazda	gas	four	sedan	rwd	front	
66	mazda	diesel	four	sedan	rwd	front	
67	mercedes-benz	diesel	four	sedan	rwd	front	
68	mercedes-benz	diesel	four	wagon	rwd	front	
69	mercedes-benz	diesel	two	hardtop	rwd	front	
70	mercedes-benz	diesel	four	sedan	rwd	front	
71	mercedes-benz	gas	four	sedan	rwd	front	
72	mercedes-benz	gas	two	convertible	rwd	front	
73	mercedes-benz	gas	four	sedan	rwd	front	
74	mercedes-benz	gas	two	hardtop	rwd	front	
75	mercury	gas	two	hatchback	rwd	front	
76	mitsubishi	gas	two	hatchback	fwd	front	
77	mitsubishi	gas	two	hatchback	fwd	front	
78	mitsubishi	gas	two	hatchback	fwd	front	
79	mitsubishi	gas	two	hatchback	fwd	front	
80	mitsubishi	gas	two	hatchback	fwd	front	
81	mitsubishi	gas	two	hatchback	fwd	front	
82	mitsubishi	gas	two	hatchback	fwd	front	
83	mitsubishi	gas	two	hatchback	fwd	front	
84	mitsubishi	gas	two	hatchback	fwd	front	

	make	fuel_type	num_of_doors	body_style	drive_wheels	engine_location	wheel
85	mitsubishi	gas	four	sedan	fwd	front	
86	mitsubishi	gas	four	sedan	fwd	front	
87	mitsubishi	gas	four	sedan	fwd	front	
89	nissan	gas	two	sedan	fwd	front	
90	nissan	diesel	two	sedan	fwd	front	
91	nissan	gas	two	sedan	fwd	front	
92	nissan	gas	four	sedan	fwd	front	
93	nissan	gas	four	wagon	fwd	front	
94	nissan	gas	two	sedan	fwd	front	
95	nissan	gas	two	hatchback	fwd	front	
96	nissan	gas	four	sedan	fwd	front	
97	nissan	gas	four	wagon	fwd	front	
98	nissan	gas	two	hardtop	fwd	front	
99	nissan	gas	four	hatchback	fwd	front	
100	nissan	gas	four	sedan	fwd	front	
101	nissan	gas	four	sedan	fwd	front	
102	nissan	gas	four	wagon	fwd	front	
103	nissan	gas	four	sedan	fwd	front	
104	nissan	gas	two	hatchback	rwd	front	
105	nissan	gas	two	hatchback	rwd	front	
106	nissan	gas	two	hatchback	rwd	front	
107	peugot	gas	four	sedan	rwd	front	
108	peugot	diesel	four	sedan	rwd	front	
109	peugot	gas	four	wagon	rwd	front	
110	peugot	diesel	four	wagon	rwd	front	
111	peugot	gas	four	sedan	rwd	front	
112	peugot	diesel	four	sedan	rwd	front	
113	peugot	gas	four	wagon	rwd	front	
114	peugot	diesel	four	wagon	rwd	front	
115	peugot	gas	four	sedan	rwd	front	

	make	fuel_type	num_of_doors	body_style	drive_wheels	engine_location	wheel
116	peugot	diesel	four	sedan	rwd	front	
117	peugot	gas	four	sedan	rwd	front	
118	plymouth	gas	two	hatchback	fwd	front	
119	plymouth	gas	two	hatchback	fwd	front	
120	plymouth	gas	four	hatchback	fwd	front	
121	plymouth	gas	four	sedan	fwd	front	
122	plymouth	gas	four	sedan	fwd	front	
123	plymouth	gas	four	wagon	fwd	front	
124	plymouth	gas	two	hatchback	rwd	front	
125	porsche	gas	two	hatchback	rwd	front	
126	porsche	gas	two	hardtop	rwd	rear	
127	porsche	gas	two	hardtop	rwd	rear	
128	porsche	gas	two	convertible	rwd	rear	
129	porsche	gas	two	hatchback	rwd	front	
130	saab	gas	two	hatchback	fwd	front	
131	saab	gas	four	sedan	fwd	front	
132	saab	gas	two	hatchback	fwd	front	
133	saab	gas	four	sedan	fwd	front	
134	saab	gas	two	hatchback	fwd	front	
135	saab	gas	four	sedan	fwd	front	
136	subaru	gas	two	hatchback	fwd	front	
137	subaru	gas	two	hatchback	fwd	front	
138	subaru	gas	two	hatchback	4wd	front	
139	subaru	gas	four	sedan	fwd	front	
140	subaru	gas	four	sedan	fwd	front	
141	subaru	gas	four	sedan	fwd	front	
142	subaru	gas	four	sedan	4wd	front	
143	subaru	gas	four	sedan	4wd	front	
144	subaru	gas	four	wagon	fwd	front	
145	subaru	gas	four	wagon	fwd	front	

	make	fuel_type	num_of_doors	body_style	drive_wheels	engine_location	wheel
146	subaru	gas	four	wagon	4wd	front	
147	subaru	gas	four	wagon	4wd	front	
148	toyota	gas	two	hatchback	fwd	front	
149	toyota	gas	two	hatchback	fwd	front	
150	toyota	gas	four	hatchback	fwd	front	
151	toyota	gas	four	wagon	fwd	front	
152	toyota	gas	four	wagon	4wd	front	
153	toyota	gas	four	wagon	4wd	front	
154	toyota	gas	four	sedan	fwd	front	
155	toyota	gas	four	hatchback	fwd	front	
156	toyota	diesel	four	sedan	fwd	front	
157	toyota	diesel	four	hatchback	fwd	front	
158	toyota	gas	four	sedan	fwd	front	
159	toyota	gas	four	hatchback	fwd	front	
160	toyota	gas	four	sedan	fwd	front	
161	toyota	gas	two	sedan	rwd	front	
162	toyota	gas	two	hatchback	rwd	front	
163	toyota	gas	two	sedan	rwd	front	
164	toyota	gas	two	hatchback	rwd	front	
165	toyota	gas	two	hardtop	rwd	front	
166	toyota	gas	two	hardtop	rwd	front	
167	toyota	gas	two	hatchback	rwd	front	
168	toyota	gas	two	hardtop	rwd	front	
169	toyota	gas	two	hatchback	rwd	front	
170	toyota	gas	two	convertible	rwd	front	
171	toyota	gas	four	sedan	fwd	front	
172	toyota	diesel	four	sedan	fwd	front	
173	toyota	gas	four	hatchback	fwd	front	
174	toyota	gas	four	sedan	fwd	front	
175	toyota	gas	four	hatchback	fwd	front	

	make	fuel_type	num_of_doors	body_style	drive_wheels	engine_location	wheel
176	toyota	gas	two	hatchback	rwd	front	
177	toyota	gas	two	hatchback	rwd	front	
178	toyota	gas	four	sedan	rwd	front	
179	toyota	gas	four	wagon	rwd	front	
180	volkswagen	diesel	two	sedan	fwd	front	
181	volkswagen	gas	two	sedan	fwd	front	
182	volkswagen	diesel	four	sedan	fwd	front	
183	volkswagen	gas	four	sedan	fwd	front	
184	volkswagen	gas	four	sedan	fwd	front	
185	volkswagen	diesel	four	sedan	fwd	front	
186	volkswagen	gas	four	sedan	fwd	front	
187	volkswagen	gas	two	convertible	fwd	front	
188	volkswagen	gas	two	hatchback	fwd	front	
189	volkswagen	gas	four	sedan	fwd	front	
190	volkswagen	diesel	four	sedan	fwd	front	
191	volkswagen	gas	four	wagon	fwd	front	
192	volvo	gas	four	sedan	rwd	front	
193	volvo	gas	four	wagon	rwd	front	
194	volvo	gas	four	sedan	rwd	front	
195	volvo	gas	four	wagon	rwd	front	
196	volvo	gas	four	sedan	rwd	front	
197	volvo	gas	four	wagon	rwd	front	
198	volvo	gas	four	sedan	rwd	front	
199	volvo	gas	four	sedan	rwd	front	
200	volvo	gas	four	sedan	rwd	front	
201	volvo	diesel	four	sedan	rwd	front	
202	volvo	gas	four	sedan	rwd	front	

In [142...

```
#to reset table
pd.reset_option('display.max_rows')
```

In [143...

a

Out[143...

	make	fuel_type	num_of_doors	body_style	drive_wheels	engine_location	wheel_base
0	alfa-romero	gas	two	convertible	rwd	front	88.4
1	alfa-romero	gas	two	convertible	rwd	front	88.4
2	alfa-romero	gas	two	hatchback	rwd	front	91.4
3	audi	gas	four	sedan	fwd	front	91.4
4	audi	gas	four	sedan	4wd	front	91.4
...
198	volvo	gas	four	sedan	rwd	front	101.3
199	volvo	gas	four	sedan	rwd	front	101.3
200	volvo	gas	four	sedan	rwd	front	101.3
201	volvo	diesel	four	sedan	rwd	front	101.3
202	volvo	gas	four	sedan	rwd	front	101.3

202 rows × 20 columns



In [144...

```
# Value count for column data type object with fall loop
```

In [145...

```
#valueue count using fall loop
for x in a.columns:
    print(a[x].value_counts())
```

```

make
toyota      32
nissan      18
mazda       17
honda       13
subaru      12
mitsubishi  12
volkswagen  12
volvo       11
peugot      11
dodge       9
mercedes-benz 8
bmw         8
audi        7
plymouth    7
saab        6
porsche     5
isuzu       4
chevrolet   3
alfa-romero 3
jaguar      3
mercury     1
Name: count, dtype: int64
fuel_type
gas         182
diesel      20
Name: count, dtype: int64
num_of_doors
four        112
two         88
Name: count, dtype: int64
body_style
sedan        95
hatchback    69
wagon        24
hardtop      8
convertible  6
Name: count, dtype: int64
drive_wheels
fwd          117
rwd          76
4wd          5
4wd          4
Name: count, dtype: int64
engine_location
front        199
rear         3
Name: count, dtype: int64
wheel_base
94.5         21
93.7         20
95.7         13
96.5         8
98.4         7
97.3         7
99.1         6

```

107.9	6
98.8	6
104.3	6
100.4	6
109.1	5
93.1	5
96.3	5
102.4	5
95.9	5
97.2	5
101.2	4
114.2	4
95.3	4
97.0	4
103.5	3
110.0	3
105.8	3
89.5	3
115.6	2
91.3	2
104.9	2
99.8	2
88.6	2
113.0	2
96.9	2
102.9	2
104.5	2
86.6	2
103.3	2
102.0	1
96.0	1
94.3	1
88.4	1
99.5	1
99.4	1
120.9	1
112.0	1
99.2	1
102.7	1
93.0	1
95.1	1
106.7	1
96.6	1
93.3	1
108.0	1
Name: count, dtype: int64	
length	
157.3	15
188.8	11
166.3	7
186.7	7
171.7	7
..	
178.5	1
162.4	1
159.3	1

```
165.7    1
183.1    1
Name: count, Length: 74, dtype: int64
width
63.8     24
66.5     22
65.4     14
63.6     11
64.4     10
68.4     10
64.0      9
65.5      8
65.2      7
66.3      6
65.6      6
67.2      6
64.2      6
67.9      5
66.9      5
65.7      4
68.9      4
64.8      4
71.4      3
71.7      3
65.0      3
70.3      3
63.9      3
64.1      2
67.7      2
69.6      2
68.3      2
66.1      2
64.6      2
66.4      1
66.2      1
60.3      1
70.9      1
62.5      1
66.0      1
61.8      1
70.6      1
68.0      1
70.5      1
72.0      1
72.3      1
63.4      1
68.8      1
Name: count, dtype: int64
height
50.8     14
52.0     12
55.7     12
54.5     10
54.1     10
55.5      9
54.3      8
```

56.7	8
56.1	7
52.6	7
53.0	6
54.9	6
52.8	6
51.6	6
50.2	6
53.7	5
55.1	5
50.6	5
53.3	4
49.6	4
58.7	4
53.5	3
59.1	3
52.5	3
56.2	3
49.7	3
57.5	3
54.7	2
48.8	2
59.8	2
56.3	2
53.9	2
51.4	2
56.5	2
54.4	2
49.4	2
53.2	1
52.4	1
53.1	1
55.9	1
55.4	1
58.3	1
51.0	1
47.8	1
56.0	1
54.8	1
50.5	1
55.6	1

Name: count, dtype: int64

curb_weight

2385	4
1989	3
1918	3
2275	3
2395	2
..	
2952	1
3049	1
3012	1
3217	1
3062	1

Name: count, Length: 170, dtype: int64

engine_type


```

ohc      145
ohcf     15
ohcv     13
dohc     12
l        12
rotor     4
dohcv     1
Name: count, dtype: int64
num_of_cylinders
four      156
six       24
five      11
eight     5
two       3
three     1
twelve    1
tow       1
Name: count, dtype: int64
engine_size
122      15
92       15
98       14
97       14
108      13
90       12
110      11
109       8
120       7
141       7
152       6
146       6
121       6
181       6
156       5
91        5
136       5
130       4
183       4
194       3
171       3
164       3
209       3
70        3
131       2
234       2
258       2
134       2
140       2
61        1
326       1
79        1
80        1
111       1
119       1
151       1
308       1

```

```

304      1
103      1
203      1
161      1
173      1
145      1
Name: count, dtype: int64
fuel_system
mpfi     92
2bbl     66
idi      20
1bbl     11
spdi      8
4bbl      3
mfi       1
spfi      1
Name: count, dtype: int64
compression_ratio
9.00      46
9.40      26
8.50      14
9.50      13
9.30      11
9.20       8
8.00       8
8.70       7
7.00       7
8.40       5
8.60       5
23.00      5
21.00      5
9.60       5
7.50       4
21.50      4
7.60       4
22.50      3
8.30       3
8.80       3
10.00      2
7.70       2
8.10       2
70.00      1
9.41       1
11.50      1
9.10       1
10.10      1
22.00      1
7.80       1
21.90      1
22.70      1
9.31       1
Name: count, dtype: int64
horsepower
68      19
70      11
69      10

```

116	8
110	8
95	7
160	6
62	6
88	6
101	6
114	6
145	5
97	5
82	5
102	5
84	5
76	5
86	4
92	4
123	4
111	4
121	3
182	3
85	3
73	3
207	3
90	3
152	3
112	2
156	2
161	2
52	2
94	2
184	2
155	2
162	2
56	2
100	2
176	2
154	1
115	1
140	1
48	1
64	1
135	1
262	1
78	1
58	1
60	1
175	1
72	1
143	1
142	1
55	1
200	1
120	1
288	1
134	1
106	1

Name: count, dtype: int64

city_mpg

31 28

19 27

24 22

27 14

17 13

26 12

23 9

21 8

25 8

30 8

38 7

28 7

37 6

16 6

22 4

20 3

18 3

29 3

15 3

14 2

47 1

36 1

13 1

49 1

45 1

32 1

35 1

34 1

33 1

Name: count, dtype: int64

highway_mpg

25 19

24 17

38 17

32 16

30 15

34 14

28 13

37 13

29 10

33 9

22 8

23 7

31 6

27 5

43 4

26 3

42 3

41 3

36 2

39 2

20 2

19 2

46 2

```

47      2
18      2
16      2
54      1
53      1
17      1
50      1
Name: count, dtype: int64
price
0          4
16500      2
6692       2
6229       2
7957       2
..
16845      1
19045      1
21485      1
22470      1
22625      1
Name: count, Length: 185, dtype: int64

```

```

In [146... # unique values in a column
a['make'].unique()

```

```

Out[146... array(['alfa-romero', 'audi', 'bmw', 'chevrolet', 'dodge', 'honda',
        'isuzu', 'jaguar', 'mazda', 'mercedes-benz', 'mercury',
        'mitsubishi', 'nissan', 'peugot', 'plymouth', 'porsche', 'saab',
        'subaru', 'toyota', 'volkswagen', 'volvo'], dtype=object)

```

```

In [147... # how many values in a column
a['make'].value_counts()

```

```

Out[147... make
toyota          32
nissan          18
mazda           17
honda           13
subaru          12
mitsubishi      12
volkswagen      12
volvo           11
peugot          11
dodge           9
mercedes-benz   8
bmw             8
audi            7
plymouth        7
saab            6
porsche         5
isuzu           4
chevrolet       3
alfa-romero     3
jaguar          3
mercury         1
Name: count, dtype: int64

```

In [148... `# how to get the number of the unique values`
`a`

Out[148...

	make	fuel_type	num_of_doors	body_style	drive_wheels	engine_location	wheel_base
0	alfa-romero	gas	two	convertible	rwd	front	88.4
1	alfa-romero	gas	two	convertible	rwd	front	88.4
2	alfa-romero	gas	two	hatchback	rwd	front	94.0
3	audi	gas	four	sedan	fwd	front	95.1
4	audi	gas	four	sedan	4wd	front	95.1
...
198	volvo	gas	four	sedan	rwd	front	105.0
199	volvo	gas	four	sedan	rwd	front	105.0
200	volvo	gas	four	sedan	rwd	front	105.0
201	volvo	diesel	four	sedan	rwd	front	105.0
202	volvo	gas	four	sedan	rwd	front	105.0

202 rows × 20 columns



In []:

In []:

In []:

In [149... `import matplotlib.pyplot as plt`
`import seaborn as sns`

In [150... `#`

In [151... `mp = a.groupby("make")["price"].mean().sort_values(ascending = False).reset_index()`

In [152... `mp`

Out[152...

	make	price
0	jaguar	34600.000000
1	mercedes-benz	33647.000000
2	bmw	26118.750000
3	porsche	25120.400000
4	volvo	18063.181818
5	mercury	16503.000000
6	alfa-romero	15498.333333
7	peugot	15489.090909
8	audi	15307.857143
9	saab	15223.333333
10	mazda	10652.882353
11	nissan	10415.666667
12	volkswagen	10077.500000
13	toyota	9885.812500
14	mitsubishi	9236.500000
15	subaru	8541.250000
16	honda	8184.692308
17	plymouth	7963.428571
18	dodge	7875.444444
19	chevrolet	6007.000000
20	isuzu	4458.250000

In [153... `sns.lineplot(x='price', y='make', data =)`

Cell In[153], line 1

`sns.lineplot(x='price', y='make', data =)`**SyntaxError:** expected argument value expressionIn []: `a['price'].plot(kind = 'hist')`In []: `#pandas
plt.hist(a['price'])`

In []:

```
In [ ]: mp = a.groupby("make")["price"].mean().sort_values(ascending = False).reset_index()
```

```
In [ ]: mp
```

```
In [ ]: sns.barplot(x = "make", y = "price", data = mp, color = "orange")
plt.xticks(rotation = 80)
plt.title("car make/price")
plt.ylabel(" ")
plt.xlabel(" ")
```

```
In [ ]: sns.histplot(a['price'], color = 'pink')
```

```
In [ ]: #scatter plot
```

```
In [ ]: # pandas
a.plot(kind = 'scatter', x = 'curb_weight', y = 'price')
```

```
In [ ]: #plt
plt.scatter(a['length'], a['width'])
```

```
In [ ]: sns.scatterplot(x = 'price', y = 'engine_size', data = a)
```

```
In [ ]: sns.regplot(x = 'price', y = 'engine_size', data = a)
```

```
In [ ]: m = a.groupby("make") ["price"].mean().sort_values(ascending = False)
plt.plot(m.index, m.values, color = "green")
```

```
m = a.groupby("make")["price"].mean().sort_values(ascending = False)
plt.plot(m.values,m.index)
```

```
In [ ]: #plt.plot(m.values, m.index, color = 'brown
plt.pie(m, labels = m.index)
```

```
In [ ]: plt.pie(m,labels =m.index, autopct = '%1.0f%%')
```

```
In [ ]: plt.pie(m, labels =m.index, autopct = '%1.f%%')
```

```
In [ ]: #boxplot - pandas
a.boxplot(column = 'price')
```

```
In [ ]: a.boxplot(column = 'price', by = 'fuel_type')
```

```
In [ ]: sns.boxplot(x = 'make', y = 'price', data = a)
plt.xticks(rotation = 70)
```

```
In [ ]:
```

```
In [ ]: # concat
```



```
# merge
```

```
In [ ]: # how to filter
a['make'] == "audi"
```

```
In [157... h= a[a['make'] == "audi"]
```

```
In [158... h
```

```
Out[158... 
```

	make	fuel_type	num_of_doors	body_style	drive_wheels	engine_location	wheel_base
3	audi	gas	four	sedan	fwd	front	99.8
4	audi	gas	four	sedan	4wd	front	99.4
5	audi	gas	two	sedan	fwd	front	99.8
6	audi	gas	four	sedan	fwd	front	105.8
7	audi	gas	four	wagon	fwd	front	105.8
8	audi	gas	four	sedan	fwd	front	105.8
9	audi	gas	two	hatchback	4wd	front	99.5



```
In [170... b =a[a["fuel_type"] == "gas"]
```

```
In [ ]:
```

```
In [ ]: a[a["fuel_type"] == "gas"]
```

```
In [ ]:
```

```
In [ ]: # concat
pd.concat([h,b]).reset_index(drop = True)
```

```
In [171... pd.merge(h,b, on = "engine_location", how = "right")
```

Out[171...

	make_x	fuel_type_x	num_of_doors_x	body_style_x	drive_wheels_x	engine_location
0	audi	gas	four	sedan	fwd	front
1	audi	gas	four	sedan	4wd	front
2	audi	gas	two	sedan	fwd	front
3	audi	gas	four	sedan	fwd	front
4	audi	gas	four	wagon	fwd	front
...
1251	audi	gas	two	sedan	fwd	front
1252	audi	gas	four	sedan	fwd	front
1253	audi	gas	four	wagon	fwd	front
1254	audi	gas	four	sedan	fwd	front
1255	audi	gas	two	hatchback	4wd	front

1256 rows × 39 columns



In [168...

h

Out[168...

	make	fuel_type	num_of_doors	body_style	drive_wheels	engine_location	wheel_base
3	audi	gas	four	sedan	fwd	front	99.8
4	audi	gas	four	sedan	4wd	front	99.4
5	audi	gas	two	sedan	fwd	front	99.8
6	audi	gas	four	sedan	fwd	front	105.8
7	audi	gas	four	wagon	fwd	front	105.8
8	audi	gas	four	sedan	fwd	front	105.8
9	audi	gas	two	hatchback	4wd	front	99.5



In [169...

b

```
Out[169... 0      True
          1      True
          2      True
          3      True
          4      True
          ...
          198    True
          199    True
          200    True
          201    False
          202    True
          Name: fuel_type, Length: 203, dtype: bool
```

```
In [ ]:
```