

# DA0101EN-Review-Introduction

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Thus, we have to add headers manually.

Firstly, we create a list “headers” that include all column names in order. Then, we use `dataframe.columns = headers` to replace the headers by the list we created.

```
[6]: # create headers list
headers = ["symboling", "normalized-losses", "make", "fuel-type", "aspiration",
→ "num-of-doors", "body-style",
→ "drive-wheels", "engine-location", "wheel-base",
→ "length", "width", "height", "curb-weight", "engine-type",
→ "num-of-cylinders",
→ "engine-size", "fuel-system", "bore", "stroke", "compression-ratio", "horsepower",
→ "peak-rpm", "city-mpg", "highway-mpg", "price"]
print("headers\n", headers)
```

headers

```
['symboling', 'normalized-losses', 'make', 'fuel-type', 'aspiration', 'num-of-
doors', 'body-style', 'drive-wheels', 'engine-location', 'wheel-base', 'length',
'width', 'height', 'curb-weight', 'engine-type', 'num-of-cylinders', 'engine-
size', 'fuel-system', 'bore', 'stroke', 'compression-ratio', 'horsepower',
'peak-rpm', 'city-mpg', 'highway-mpg', 'price']
```

We replace headers and recheck our data frame

```
[7]: df.columns = headers
df.head(10)
```

[7]: symboling normalized-losses make fuel-type aspiration num-of-doors \

0	3	?	alfa-romero	gas	std	two
1	3	?	alfa-romero	gas	std	two
2	1	?	alfa-romero	gas	std	two
3	2	164	audi	gas	std	four
4	2	164	audi	gas	std	four
5	2	?	audi	gas	std	two
6	1	158	audi	gas	std	four
7	1	?	audi	gas	std	four
8	1	158	audi	gas	turbo	four
9	0	?	audi	gas	turbo	two

	body-style	drive-wheels	engine-location	wheel-base	...	engine-size	\
0	convertible	rwd	front	88.6	...	130	
1	convertible	rwd	front	88.6	...	130	
2	hatchback	rwd	front	94.5	...	152	
3	sedan	fwd	front	99.8	...	109	
4	sedan	4wd	front	99.4	...	136	
5	sedan	fwd	front	99.8	...	136	
6	sedan	fwd	front	105.8	...	136	
7	wagon	fwd	front	105.8	...	136	
8	sedan	fwd	front	105.8	...	131	
9	hatchback	4wd	front	99.5	...	131	

	fuel-system	bore	stroke	compression-ratio	horsepower	peak-rpm	city-mpg	\
0	mpfi	3.47	2.68	9.0	111	5000	21	
1	mpfi	3.47	2.68	9.0	111	5000	21	
2	mpfi	2.68	3.47	9.0	154	5000	19	
3	mpfi	3.19	3.40	10.0	102	5500	24	
4	mpfi	3.19	3.40	8.0	115	5500	18	
5	mpfi	3.19	3.40	8.5	110	5500	19	
6	mpfi	3.19	3.40	8.5	110	5500	19	
7	mpfi	3.19	3.40	8.5	110	5500	19	
8	mpfi	3.13	3.40	8.3	140	5500	17	
9	mpfi	3.13	3.40	7.0	160	5500	16	

	highway-mpg	price
0	27	13495
1	27	16500
2	26	16500
3	30	13950
4	22	17450
5	25	15250
6	25	17710
7	25	18920
8	20	23875
9	22	?

[10 rows x 26 columns]

we can drop missing values along the column “price” as follows

```
[8]: df.dropna(subset=["price"], axis=0)
```

```
[8]: symboling normalized-losses      make fuel-type aspiration \
```

0	3	?	alfa-romero	gas	std
1	3	?	alfa-romero	gas	std
2	1	?	alfa-romero	gas	std
3	2	164	audi	gas	std
4	2	164	audi	gas	std
5	2	?	audi	gas	std
6	1	158	audi	gas	std
7	1	?	audi	gas	std
8	1	158	audi	gas	turbo
9	0	?	audi	gas	turbo
10	2	192	bmw	gas	std
11	0	192	bmw	gas	std
12	0	188	bmw	gas	std
13	0	188	bmw	gas	std
14	1	?	bmw	gas	std
15	0	?	bmw	gas	std
16	0	?	bmw	gas	std
17	0	?	bmw	gas	std
18	2	121	chevrolet	gas	std
19	1	98	chevrolet	gas	std
20	0	81	chevrolet	gas	std
21	1	118	dodge	gas	std
22	1	118	dodge	gas	std
23	1	118	dodge	gas	turbo
24	1	148	dodge	gas	std
25	1	148	dodge	gas	std
26	1	148	dodge	gas	std
27	1	148	dodge	gas	turbo
28	-1	110	dodge	gas	std
29	3	145	dodge	gas	turbo
...	...	...	...	...	...
175	-1	65	toyota	gas	std
176	-1	65	toyota	gas	std
177	-1	65	toyota	gas	std
178	3	197	toyota	gas	std
179	3	197	toyota	gas	std
180	-1	90	toyota	gas	std
181	-1	?	toyota	gas	std
182	2	122	volkswagen	diesel	std
183	2	122	volkswagen	gas	std
184	2	94	volkswagen	diesel	std

185	2	94	volkswagen	gas	std
186	2	94	volkswagen	gas	std
187	2	94	volkswagen	diesel	turbo
188	2	94	volkswagen	gas	std
189	3	?	volkswagen	gas	std
190	3	256	volkswagen	gas	std
191	0	?	volkswagen	gas	std
192	0	?	volkswagen	diesel	turbo
193	0	?	volkswagen	gas	std
194	-2	103	volvo	gas	std
195	-1	74	volvo	gas	std
196	-2	103	volvo	gas	std
197	-1	74	volvo	gas	std
198	-2	103	volvo	gas	turbo
199	-1	74	volvo	gas	turbo
200	-1	95	volvo	gas	std
201	-1	95	volvo	gas	turbo
202	-1	95	volvo	gas	std
203	-1	95	volvo	diesel	turbo
204	-1	95	volvo	gas	turbo

	num-of-doors	body-style	drive-wheels	engine-location	wheel-base	...	\
0	two	convertible	rwd	front	88.6	...	
1	two	convertible	rwd	front	88.6	...	
2	two	hatchback	rwd	front	94.5	...	
3	four	sedan	fwd	front	99.8	...	
4	four	sedan	4wd	front	99.4	...	
5	two	sedan	fwd	front	99.8	...	
6	four	sedan	fwd	front	105.8	...	
7	four	wagon	fwd	front	105.8	...	
8	four	sedan	fwd	front	105.8	...	
9	two	hatchback	4wd	front	99.5	...	
10	two	sedan	rwd	front	101.2	...	
11	four	sedan	rwd	front	101.2	...	
12	two	sedan	rwd	front	101.2	...	
13	four	sedan	rwd	front	101.2	...	
14	four	sedan	rwd	front	103.5	...	
15	four	sedan	rwd	front	103.5	...	
16	two	sedan	rwd	front	103.5	...	
17	four	sedan	rwd	front	110.0	...	
18	two	hatchback	fwd	front	88.4	...	
19	two	hatchback	fwd	front	94.5	...	
20	four	sedan	fwd	front	94.5	...	
21	two	hatchback	fwd	front	93.7	...	
22	two	hatchback	fwd	front	93.7	...	
23	two	hatchback	fwd	front	93.7	...	
24	four	hatchback	fwd	front	93.7	...	

25	four	sedan	fwd	front	93.7 ...
26	four	sedan	fwd	front	93.7 ...
27	?	sedan	fwd	front	93.7 ...
28	four	wagon	fwd	front	103.3 ...
29	two	hatchback	fwd	front	95.9 ...
..	...	...	...	...	...
175	four	hatchback	fwd	front	102.4 ...
176	four	sedan	fwd	front	102.4 ...
177	four	hatchback	fwd	front	102.4 ...
178	two	hatchback	rwd	front	102.9 ...
179	two	hatchback	rwd	front	102.9 ...
180	four	sedan	rwd	front	104.5 ...
181	four	wagon	rwd	front	104.5 ...
182	two	sedan	fwd	front	97.3 ...
183	two	sedan	fwd	front	97.3 ...
184	four	sedan	fwd	front	97.3 ...
185	four	sedan	fwd	front	97.3 ...
186	four	sedan	fwd	front	97.3 ...
187	four	sedan	fwd	front	97.3 ...
188	four	sedan	fwd	front	97.3 ...
189	two	convertible	fwd	front	94.5 ...
190	two	hatchback	fwd	front	94.5 ...
191	four	sedan	fwd	front	100.4 ...
192	four	sedan	fwd	front	100.4 ...
193	four	wagon	fwd	front	100.4 ...
194	four	sedan	rwd	front	104.3 ...
195	four	wagon	rwd	front	104.3 ...
196	four	sedan	rwd	front	104.3 ...
197	four	wagon	rwd	front	104.3 ...
198	four	sedan	rwd	front	104.3 ...
199	four	wagon	rwd	front	104.3 ...
200	four	sedan	rwd	front	109.1 ...
201	four	sedan	rwd	front	109.1 ...
202	four	sedan	rwd	front	109.1 ...
203	four	sedan	rwd	front	109.1 ...
204	four	sedan	rwd	front	109.1 ...

	engine-size	fuel-system	bore	stroke	compression-ratio	horsepower \
0	130	mpfi	3.47	2.68	9.00	111
1	130	mpfi	3.47	2.68	9.00	111
2	152	mpfi	2.68	3.47	9.00	154
3	109	mpfi	3.19	3.40	10.00	102
4	136	mpfi	3.19	3.40	8.00	115
5	136	mpfi	3.19	3.40	8.50	110
6	136	mpfi	3.19	3.40	8.50	110
7	136	mpfi	3.19	3.40	8.50	110
8	131	mpfi	3.13	3.40	8.30	140

9	131	mpfi	3.13	3.40	7.00	160
10	108	mpfi	3.50	2.80	8.80	101
11	108	mpfi	3.50	2.80	8.80	101
12	164	mpfi	3.31	3.19	9.00	121
13	164	mpfi	3.31	3.19	9.00	121
14	164	mpfi	3.31	3.19	9.00	121
15	209	mpfi	3.62	3.39	8.00	182
16	209	mpfi	3.62	3.39	8.00	182
17	209	mpfi	3.62	3.39	8.00	182
18	61	2bbl	2.91	3.03	9.50	48
19	90	2bbl	3.03	3.11	9.60	70
20	90	2bbl	3.03	3.11	9.60	70
21	90	2bbl	2.97	3.23	9.41	68
22	90	2bbl	2.97	3.23	9.40	68
23	98	mpfi	3.03	3.39	7.60	102
24	90	2bbl	2.97	3.23	9.40	68
25	90	2bbl	2.97	3.23	9.40	68
26	90	2bbl	2.97	3.23	9.40	68
27	98	mpfi	3.03	3.39	7.60	102
28	122	2bbl	3.34	3.46	8.50	88
29	156	mfi	3.60	3.90	7.00	145
..	...	...	...	...	...	...
175	122	mpfi	3.31	3.54	8.70	92
176	122	mpfi	3.31	3.54	8.70	92
177	122	mpfi	3.31	3.54	8.70	92
178	171	mpfi	3.27	3.35	9.30	161
179	171	mpfi	3.27	3.35	9.30	161
180	171	mpfi	3.27	3.35	9.20	156
181	161	mpfi	3.27	3.35	9.20	156
182	97	idi	3.01	3.40	23.00	52
183	109	mpfi	3.19	3.40	9.00	85
184	97	idi	3.01	3.40	23.00	52
185	109	mpfi	3.19	3.40	9.00	85
186	109	mpfi	3.19	3.40	9.00	85
187	97	idi	3.01	3.40	23.00	68
188	109	mpfi	3.19	3.40	10.00	100
189	109	mpfi	3.19	3.40	8.50	90
190	109	mpfi	3.19	3.40	8.50	90
191	136	mpfi	3.19	3.40	8.50	110
192	97	idi	3.01	3.40	23.00	68
193	109	mpfi	3.19	3.40	9.00	88
194	141	mpfi	3.78	3.15	9.50	114
195	141	mpfi	3.78	3.15	9.50	114
196	141	mpfi	3.78	3.15	9.50	114
197	141	mpfi	3.78	3.15	9.50	114
198	130	mpfi	3.62	3.15	7.50	162
199	130	mpfi	3.62	3.15	7.50	162



200	141	mpfi	3.78	3.15	9.50	114
201	141	mpfi	3.78	3.15	8.70	160
202	173	mpfi	3.58	2.87	8.80	134
203	145	idi	3.01	3.40	23.00	106
204	141	mpfi	3.78	3.15	9.50	114

	peak-rpm	city-mpg	highway-mpg	price
0	5000	21	27	13495
1	5000	21	27	16500
2	5000	19	26	16500
3	5500	24	30	13950
4	5500	18	22	17450
5	5500	19	25	15250
6	5500	19	25	17710
7	5500	19	25	18920
8	5500	17	20	23875
9	5500	16	22	?
10	5800	23	29	16430
11	5800	23	29	16925
12	4250	21	28	20970
13	4250	21	28	21105
14	4250	20	25	24565
15	5400	16	22	30760
16	5400	16	22	41315
17	5400	15	20	36880
18	5100	47	53	5151
19	5400	38	43	6295
20	5400	38	43	6575
21	5500	37	41	5572
22	5500	31	38	6377
23	5500	24	30	7957
24	5500	31	38	6229
25	5500	31	38	6692
26	5500	31	38	7609
27	5500	24	30	8558
28	5000	24	30	8921
29	5000	19	24	12964
..	...	...	...	...
175	4200	27	32	9988
176	4200	27	32	10898
177	4200	27	32	11248
178	5200	20	24	16558
179	5200	19	24	15998
180	5200	20	24	15690
181	5200	19	24	15750
182	4800	37	46	7775
183	5250	27	34	7975