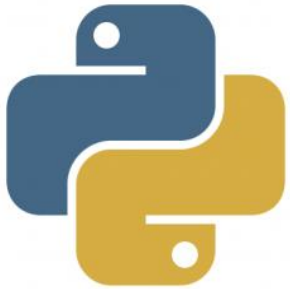
Working With



python

Data Frames 4

Sample Data

Automobile_data.csv

	index	company	body-style	wheel-base	length	engine-type	num-of-cylinders	horsepower	average-mileage	price
0	0	alfa-romero	convertible	88.6	168.8	dohc	four	111	21	13495.0
1	1	alfa-romero	convertible	88.6	168.8	dohc	four	111	21	16500.0
2	2	alfa-romero	hatchback	94.5	171.2	ohcv	six	154	19	16500.0
3	3	audi	sedan	99.8	176.6	ohc	four	102	24	13950.0
4	4	audi	sedan	99.4	176.6	ohc	five	115	18	17450.0
...	...	...	...	...	...	...	...	...	...	...
56	81	volkswagen	sedan	97.3	171.7	ohc	four	85	27	7975.0
57	82	volkswagen	sedan	97.3	171.7	ohc	four	52	37	7995.0
58	86	volkswagen	sedan	97.3	171.7	ohc	four	100	26	9995.0
59	87	volvo	sedan	104.3	188.8	ohc	four	114	23	12940.0
60	88	volvo	wagon	104.3	188.8	ohc	four	114	23	13415.0

61 rows × 10 columns

python

Pandas

Grouping Values

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Grouping Values

Example 1:

```
df.groupby("company").sum()
```

company	index	wheel-base	length	horsepower	average-mileage	price
alfa-romero	3	271.7	508.8	376	61	46495.0
audi	18	404.8	723.2	437	80	65570.0
bmw	72	620.6	1110.2	869	114	163280.0
chevrolet	51	277.4	455.8	188	123	18021.0
dodge	39	187.4	314.6	136	62	12606.0
honda	84	289.5	501.6	277	79	30585.0
isuzu	93	283.3	482.5	218	100	6785.0
jaguar	102	328.0	590.9	614	43	103800.0
mazda	193	479.5	821.3	377	140	48274.0
mercedes-benz	182	452.9	789.1	614	72	140160.0
mitsubishi	202	380.0	659.4	312	118	26756.0
nissan	275	478.4	850.7	414	157	41445.0
porsche	186	277.4	513.5	702	51	71056.0
toyota	490	678.7	1173.0	528	201	57518.0
volkswagen	329	389.2	686.8	289	127	33740.0
volvo	175	208.6	377.6	228	46	26355.0

Grouping Values

Example 2:

body-style	index	company	wheel-base	length	engine-type	num-of-cylinders	horsepower	average-mileage	price
convertible	3	3	3	3	3	3	3	3	3
hardtop	2	2	2	2	2	2	2	2	2
hatchback	15	15	15	15	15	15	15	15	14
sedan	32	32	32	32	32	32	32	32	30
wagon	9	9	9	9	9	9	9	9	9

```
df.groupby("body-style").count()
```

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Querying Grouped Values


```
df.groupby('company').sum().query('price>100000')
```

company	index	wheel-base	length	horsepower	average-mileage	price
bmw	72	620.6	1110.2	869	114	163280.0
jaguar	102	328.0	590.9	614	43	103800.0
mercedes-benz	182	452.9	789.1	614	72	140160.0

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Sorting Values

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Sorting Values


```
df.sort_values(by="company").head()
```

	index	company	body-style	wheel-base	length	engine-type	num-of-cylinders	horsepower	average-mileage	price
0	0	alfa-romero	convertible	88.6	168.8	dohc	four	111	21	13495.0
1	1	alfa-romero	convertible	88.6	168.8	dohc	four	111	21	16500.0
2	2	alfa-romero	hatchback	94.5	171.2	ohcv	six	154	19	16500.0
3	3	audi	sedan	99.8	176.6	ohc	four	102	24	13950.0
4	4	audi	sedan	99.4	176.6	ohc	five	115	18	17450.0

Example 1

```
df.sort_values(by="company", ascending = False).head()
```

	index	company	body-style	wheel-base	length	engine-type	num-of-cylinders	horsepower	average-mileage	price
60	88	volvo	wagon	104.3	188.8	ohc	four	114	23	13415.0
59	87	volvo	sedan	104.3	188.8	ohc	four	114	23	12940.0
58	86	volkswagen	sedan	97.3	171.7	ohc	four	100	26	9995.0
57	82	volkswagen	sedan	97.3	171.7	ohc	four	52	37	7995.0
56	81	volkswagen	sedan	97.3	171.7	ohc	four	85	27	7975.0

Sorting Values


```
df.sort_values(by="price").head()
```

	index	company	body-style	wheel-base	length	engine-type	num-of-cylinders	horsepower	average-mileage	price
13	16	chevrolet	hatchback	88.4	141.1	l	three	48	47	5151.0
27	36	mazda	hatchback	93.1	159.1	ohc	four	68	30	5195.0
48	66	toyota	hatchback	95.7	158.7	ohc	four	62	35	5348.0
36	49	mitsubishi	hatchback	93.7	157.3	ohc	four	68	37	5389.0
28	37	mazda	hatchback	93.1	159.1	ohc	four	68	31	6095.0

Example 2

```
df.sort_values(by="price", ascending = False).head()
```

	index	company	body-style	wheel-base	length	engine-type	num-of-cylinders	horsepower	average-mileage	price
35	47	mercedes-benz	hardtop	112.0	199.2	ohcv	eight	184	14	45400.0
11	14	bmw	sedan	103.5	193.8	ohc	six	182	16	41315.0
34	46	mercedes-benz	sedan	120.9	208.1	ohcv	eight	184	14	40960.0
46	62	porsche	convertible	89.5	168.9	ohcf	six	207	17	37028.0
12	15	bmw	sedan	110.0	197.0	ohc	six	182	15	36880.0

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Concatenating Values

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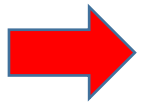
Concatenating Values

df[['company','horsepower']].head()

	company	horsepower
0	alfa-romero	111
1	alfa-romero	111
2	alfa-romero	154
3	audi	102
4	audi	115

df[['company','horsepower']].tail()

	company	horsepower
56	volkswagen	85
57	volkswagen	52
58	volkswagen	100
59	volvo	114
60	volvo	114



	company	horsepower
0	alfa-romero	111
1	alfa-romero	111
2	alfa-romero	154
3	audi	102
4	audi	115
56	volkswagen	85
57	volkswagen	52
58	volkswagen	100
59	volvo	114
60	volvo	114

pd.concat([a, b], axis=0)

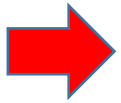
Concatenating Values

df[['company', 'horsepower']].head()

	company	horsepower
0	alfa-romero	111
1	alfa-romero	111
2	alfa-romero	154
3	audi	102
4	audi	115

df[['body-style', 'length']].head()

	body-style	length
0	convertible	168.8
1	convertible	168.8
2	hatchback	171.2
3	sedan	176.6
4	sedan	176.6



	company	horsepower	body-style	length
0	alfa-romero	111	convertible	168.8
1	alfa-romero	111	convertible	168.8
2	alfa-romero	154	hatchback	171.2
3	audi	102	sedan	176.6
4	audi	115	sedan	176.6

pd.concat([a, b], axis=1)

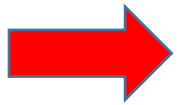
Pandas

Pivot & Pivot Tables

Pivot Tables

	index	company	body-style	wheel-base	length	engine-type	num-of-cylinders	horsepower	average-mileage	price
0	0	alfa-romero	convertible	88.6	168.8	dohc	four	111	21	13495.0
1	1	alfa-romero	convertible	88.6	168.8	dohc	four	111	21	16500.0
2	2	alfa-romero	hatchback	94.5	171.2	ohcv	six	154	19	16500.0
3	3	audi	sedan	99.8	176.6	ohc	four	102	24	13950.0
4	4	audi	sedan	99.4	176.6	ohc	five	115	18	17450.0
...	...	...	...	...	...	...	...	...	...	...
56	81	volkswagen	sedan	97.3	171.7	ohc	four	85	27	7975.0
57	82	volkswagen	sedan	97.3	171.7	ohc	four	52	37	7995.0
58	86	volkswagen	sedan	97.3	171.7	ohc	four	100	26	9995.0
59	87	volvo	sedan	104.3	188.8	ohc	four	114	23	12940.0
60	88	volvo	wagon	104.3	188.8	ohc	four	114	23	13415.0

61 rows × 10 columns



		horsepower	price
company	body-style		
alfa-romero	convertible	111.000000	14997.500000
	hatchback	154.000000	16500.000000
audi	sedan	109.000000	15550.000000
	wagon	110.000000	18920.000000
bmw	sedan	144.833333	27213.333333
chevrolet	hatchback	59.000000	5723.000000
	sedan	70.000000	6575.000000
dodge	hatchback	68.000000	6303.000000
honda	sedan	101.000000	12945.000000
	wagon	76.000000	7295.000000

```
pd.pivot_table(auto, index=["company","body-style"],values=["horsepower","price"])
```