

Tutorial Week 3: Pandas for Tabular Data (Questions)

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Example: Load the automobile dataset and print the first 5 rows

Hint:

- The data are available in the files [automobile_data.csv](#).
- Use Pandas `read_csv()` to load the automobile dataset.
- Use Pandas `head()` to return the first `n` rows.

```
[1]: import pandas as pd

    ### Start your code here ###

df = pd.read_csv("automobile_data.csv")
df.head(5)

    ### End your code here ###
```

```
[1]:
```

	index	company	body-style	wheel-base	length	engine-type	\
0	0	alfa-romero	convertible	88.6	168.8	dohc	
1	1	alfa-romero	convertible	88.6	168.8	dohc	
2	2	alfa-romero	hatchback	94.5	171.2	ohcv	
3	3	audi	sedan	99.8	176.6	ohc	
4	4	audi	sedan	99.4	176.6	ohc	

	num-of-cylinders	horsepower	average-mileage	price
0	four	111	21	13495
1	four	111	21	16500
2	six	154	19	16500
3	four	102	24	13950
4	five	115	18	17450

1 Questions

Hint:

- The data are available in the files [automobile_data.csv](#).
- Write **your code** between two comment lines: `### Start/End your code here ###`.
- **Expected output** is shown at the end of each question (directly below the code cell).

1.1 Drop the rows where at least one element is missing

Hint:

- Use Pandas `dropna()`.

```
[2]: import pandas as pd
import numpy as np

# dictionary with list object in values
details = {
    'Name' : ['Ankit', 'Aishwarya', 'Shaurya', 'Shivangi'],
    'Age' : [23, np.nan, 22, 21],
    'University' : ['BHU', 'JNU', np.nan, 'BHU'],
}

# creating a Dataframe object
df = pd.DataFrame(details)

### Start your code here ###

### End your code here ###
```

```
[2]:      Name  Age University
0   Ankit  23.0         BHU
3  Shivangi  21.0         BHU
```

1.2 Print all details of Toyota cars

Hint:

- Use Pandas selection method.

```
[3]: import pandas as pd

df = pd.read_csv("automobile_data.csv")

### Start your code here ###

### End your code here ###
```

```
[3]:      index company body-style  wheel-base  length engine-type num-of-cylinders
→ \
44      66  toyota  hatchback      95.7    158.7         ohc         four
45      67  toyota  hatchback      95.7    158.7         ohc         four
46      68  toyota  hatchback      95.7    158.7         ohc         four
47      69  toyota    wagon      95.7    169.7         ohc         four
48      70  toyota    wagon      95.7    169.7         ohc         four
49      71  toyota    wagon      95.7    169.7         ohc         four
50      79  toyota    wagon     104.5    187.8        dohc         six

      horsepower  average-mileage  price
```

44	62	35	5348
45	62	31	6338
46	62	31	6488
47	62	31	6918
48	62	27	7898
49	62	27	8778
50	156	19	15750

1.3 Find the most expensive car's company name

- Print most expensive car's company name and price.

```
[4]: import pandas as pd

df = pd.read_csv("automobile_data.csv")

### Start your code here ###

### End your code here ###
```

```
[4]:          company  price
32  mercedes-benz  45400
```

1.4 Count total cars per company

Hint:

- Use Pandas `value_counts()`.

```
[5]: import pandas as pd

df = pd.read_csv("automobile_data.csv")

### Start your code here ###

### End your code here ###
```

```
[5]: toyota          7
    bmw             6
    mazda           5
    nissan           5
    audi            4
    mercedes-benz    4
    mitsubishi       4
    volkswagen       4
    alfa-romero      3
    honda            3
    jaguar           3
```

```
chevrolet      2
dodge          2
porsche        2
volvo          2
isuzu          1
Name: company, dtype: int64
```

1.5 Find each company's Higesht price car

```
[6]: import pandas as pd

df = pd.read_csv("automobile_data.csv")

### Start your code here ###

### End your code here ###
```

```
[6]: company
alfa-romero    16500
audi           18920
bmw            41315
chevrolet      6575
dodge          6377
honda          12945
isuzu          6785
jaguar         36000
mazda          18344
mercedes-benz  45400
mitsubishi     8189
nissan         13499
porsche        37028
toyota         15750
volkswagen     9995
volvo         13415
Name: price, dtype: int64
```

1.6 Find the average mileage of each car making company

```
[7]: import pandas as pd

df = pd.read_csv("automobile_data.csv")

### Start your code here ###

### End your code here ###
```

```
[7]: company
    alfa-romero      20.333333
    audi             20.000000
    bmw              19.000000
    chevrolet        38.000000
    dodge            31.000000
    honda            26.333333
    isuzu            24.000000
    jaguar           14.333333
    mazda            28.000000
    mercedes-benz    18.000000
    mitsubishi       29.500000
    nissan            31.400000
    porsche          17.000000
    toyota           28.714286
    volkswagen       31.750000
    volvo            23.000000
    Name: average-mileage, dtype: float64
```

1.7 Sort all cars by Price column in descending order

Hint:

- Use Pandas `sort_values()`.
- Print the first 5 rows of the sorted Dataframe.

```
[8]: import pandas as pd

df = pd.read_csv("automobile_data.csv")

### Start your code here ###

### End your code here ###
```

```
[8]:
```

	index	company	body-style	wheel-base	length	engine-type	\
32	47	mercedes-benz	hardtop	112.0	199.2	ohcv	
11	14	bmw	sedan	103.5	193.8	ohc	
31	46	mercedes-benz	sedan	120.9	208.1	ohcv	
43	62	porsche	convertible	89.5	168.9	ohcf	
12	15	bmw	sedan	110.0	197.0	ohc	

	num-of-cylinders	horsepower	average-mileage	price
32	eight	184	14	45400
11	six	182	16	41315
31	eight	184	14	40960
43	six	207	17	37028
12	six	182	15	36880

1.8 Concatenate two Dataframes and reset the index of the combined Dataframe

Hint:

- Use Pandas `concat()` and its `ignore_index` option.

```
[9]: import pandas as pd

df1 = pd.DataFrame({'Company': ['Ford', 'Mercedes', 'BMW', 'Audi'], 'Price': [23845, 171995, 135925, 71400]})

df2 = pd.DataFrame({'Company': ['Toyota', 'Honda', 'Nissan', 'Mitsubishi'], 'Price': [29995, 23600, 61500, 58900]})

### Start your code here ###

### End your code here ###
```

```
[9]:      Company  Price
0      Ford    23845
1  Mercedes  171995
2      BMW    135925
3      Audi    71400
4    Toyota    29995
5      Honda    23600
6     Nissan    61500
7  Mitsubishi    58900
```

1.9 Merge two data frames using the following condition

- Create two DataFrames using the following two Dictionaries.
- Merge two DataFrames on the Company column.

```
[10]: import pandas as pd

dict1 = {'Company': ['Toyota', 'Honda', 'BMW', 'Audi', 'Jaguar'], 'Price': [23845, 17995, 135925, 71400, 23725]}
df1 = pd.DataFrame(dict1)

dict2 = {'Company': ['Toyota', 'Honda', 'BMW', 'Audi', 'Jaguar'], 'horsepower': [141, 80, 182, 160, 220]}
df2 = pd.DataFrame(dict2)

### Start your code here ###

### End your code here ###
```

```
[10]:   Company    Price  horsepower
      0  Toyota   23845         141
      1   Honda   17995          80
      2    BMV  135925         182
      3   Audi   71400         160
      4  Jaguar   23725         220
```