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2ECE-D

PROBLEM 1

```
1 import pandas as pd
2 cars=pd.read_csv('cars.csv')
3
4 top=cars.loc[0:5]
5 bottom=cars.loc[27:31]
6 result=pd.concat([top,bottom])
7
8 print(result)
```

| Index | Model | mpg | cyl | disp | hp | drat | wt | qsec | vs | am | gear | carb |
|-------|-------------------|------|-----|------|-----|------|-------|-------|----|----|------|------|
| 0 | Mazda RX4 | 21.0 | 6 | 160 | 110 | 3.9 | 2.62 | 16.46 | 0 | 1 | 4 | 4 |
| 1 | Mazda RX4 Wag | 21.0 | 6 | 160 | 110 | 3.9 | 2.875 | 17.02 | 0 | 1 | 4 | 4 |
| 2 | Datsun 710 | 22.8 | 4 | 108 | 93 | 3.85 | 2.32 | 18.61 | 1 | 1 | 4 | 1 |
| 3 | Hornet 4 Drive | 21.4 | 6 | 258 | 110 | 3.08 | 3.215 | 19.44 | 1 | 0 | 3 | 1 |
| 4 | Hornet Sportabout | 18.7 | 8 | 360 | 175 | 3.15 | 3.44 | 17.02 | 0 | 0 | 3 | 2 |
| 5 | Valiant | 18.1 | 6 | 225 | 105 | 2.76 | 3.46 | 20.22 | 1 | 0 | 3 | 1 |
| 27 | Lotus Europa | 30.4 | 4 | 95.1 | 113 | 3.77 | 1.513 | 16.9 | 1 | 1 | 5 | 2 |
| 28 | Ford Pantera L | 15.8 | 8 | 351 | 264 | 4.22 | 3.17 | 14.5 | 0 | 1 | 5 | 4 |
| 29 | Ferrari Dino | 19.7 | 6 | 145 | 175 | 3.62 | 2.77 | 15.5 | 0 | 1 | 5 | 6 |
| 30 | Maserati Bora | 15 | 8 | 301 | 335 | 3.54 | 3.57 | 14.6 | 0 | 1 | 5 | 8 |
| 31 | Volvo 142E | 21.4 | 4 | 121 | 109 | 4.11 | 2.78 | 18.6 | 1 | 1 | 4 | 2 |

PROBLEM 2A

```
1 import pandas as pd
2 cars=pd.read_csv('cars.csv')
3
4 #2a
5 x=cars.loc[0:5,0:2]
6 print(x)
7
8 #2b
9 mazda=cars.iloc[[0]]
10 print(mazda)
11
12
13 #2c
14 camaro=cars.loc[[23],['cyl']]
15 print(camaro)
16
17 #2d
18 mazhonford=cars.loc[[1,18,30],['Model','cyl','gear']]
19 print(mazhonford)
```

| Index | Model | cyl | hp | wt | vs | gear |
|-------|-------------------|-----|-----|-------|----|------|
| 0 | Mazda RX4 | 6 | 110 | 2.62 | 0 | 4 |
| 1 | Mazda RX4 Wag | 6 | 110 | 2.875 | 0 | 4 |
| 2 | Datsun 710 | 4 | 93 | 2.32 | 1 | 4 |
| 3 | Hornet 4 Drive | 6 | 110 | 3.215 | 1 | 3 |
| 4 | Hornet Sportabout | 8 | 175 | 3.44 | 0 | 3 |

PROBLEM 2B

The screenshot shows a Jupyter Notebook interface with a code editor on the left and a variable explorer on the right. The code in the editor is as follows:

```
1 import pandas as pd
2 cars=pd.read_csv('cars.csv')
3
4 #2a
5 x=cars.loc[0:5,0::4]
6 print(x)
7
8 #2B
9 mazda=cars.iloc[[0]]
10 print(mazda)
11
12
13 #2C
14 camaro=cars.loc[[23],['cyl']]
15 print(camaro)
16
17 #2D
18 mazhonford=cars.loc[[1,18,28],['Model','cyl','gear']]
19 print(mazhonford)
20
21
22
23
```

The variable explorer on the right shows the following variables:

| Name | Type | Size | Value |
|------------|-----------|----------|--|
| bottom | DataFrame | (5, 12) | Column names: Model, mpg, cyl, disp, hp, drat, wt, qsec, vs, am, gear, ... |
| camaro | DataFrame | (1, 1) | Column names: cyl |
| cars | DataFrame | (32, 12) | Column names: Model, mpg, cyl, disp, hp, drat, wt, qsec, vs, am, gear, ... |
| mazda | DataFrame | (1, 12) | Column names: Model, mpg, cyl, disp, hp, drat, wt, qsec, vs, am, gear, ... |
| mazhonford | DataFrame | (3, 3) | Column names: Model, cyl, gear |
| result | DataFrame | (11, 12) | Column names: Model, mpg, cyl, disp, hp, drat, wt, qsec, vs, am, gear, ... |
| top | DataFrame | (6, 12) | Column names: Model, mpg, cyl, disp, hp, drat, wt, qsec, vs, am, gear, ... |
| x | DataFrame | (5, 6) | Column names: Model, cyl, hp, wt, vs, gear |

A preview window for the 'mazda' DataFrame is open, showing the following data:

| Index | Model | mpg | cyl | disp | hp | drat | wt | qsec | vs | am | gear | carb |
|-------|-----------|-----|-----|------|-----|------|------|-------|----|----|------|------|
| 0 | Mazda RX4 | 21 | 6 | 160 | 110 | 3.9 | 2.62 | 16.46 | 0 | 1 | 4 | 4 |

The bottom of the interface shows the IPython console with the output of the code:

```
[11 rows x 12 columns]
  Model  mpg  cyl  disp  hp  drat  wt  qsec  vs  am  gear  carb
0  Mazda RX4   21.0    6  160.0  110   3.9  2.62  16.46  0    1     4     4
```

PROBLEM 2C

The screenshot shows a Jupyter Notebook interface with a code editor on the left and a variable explorer on the right. The code in the editor is identical to the one in Problem 2B:

```
1 import pandas as pd
2 cars=pd.read_csv('cars.csv')
3
4 #2a
5 x=cars.loc[0:5,0::4]
6 print(x)
7
8 #2B
9 mazda=cars.iloc[[0]]
10 print(mazda)
11
12
13 #2C
14 camaro=cars.loc[[23],['cyl']]
15 print(camaro)
16
17 #2D
18 mazhonford=cars.loc[[1,18,28],['Model','cyl','gear']]
19 print(mazhonford)
20
21
22
23
```

The variable explorer on the right shows the same variables as in Problem 2B. A preview window for the 'camaro' DataFrame is open, showing the following data:

| Index | cyl |
|-------|-----|
| 23 | 8 |

The bottom of the interface shows the IPython console with the output of the code:

```
cyl
23
8
```

PROBLEM 2D

The screenshot displays a Jupyter Notebook environment with a code editor on the left and a variable explorer on the right. The code in the editor defines a pandas DataFrame 'cars' and performs several operations: selecting columns 0:5, selecting the first row, selecting the first row of the 'mazda' group, selecting the 'cyl' column for the 'camaro' group, and selecting columns 1, 18, and 28 for the 'mashonford' group. The variable explorer on the right shows the state of the variables: 'bottom' (5x12 DataFrame), 'camaro' (1x1 DataFrame), 'cars' (32x12 DataFrame), 'mashonford' (1x12 DataFrame), 'mashonford' (3x3 DataFrame), 'result' (11x12 DataFrame), 'top' (6x12 DataFrame), and 'x' (5x6 DataFrame). Below the variable explorer, the IPython console shows the output of the last print statement, which is a DataFrame with columns 'Model', 'cyl', and 'gear' for the 'mashonford' group. The console output is as follows:

| | Model | cyl | gear |
|----|----------------|-----|------|
| 1 | Mazda RX4 Wag | 6 | 4 |
| 18 | Honda Civic | 4 | 4 |
| 28 | Ford Pantera L | 8 | 5 |

The variable explorer also shows a preview of the 'mashonford' DataFrame, which is a 3x3 DataFrame with columns 'Model', 'cyl', and 'gear'.