IT 166 Lab 12 pandas

Objectives

- Be able to use pandas to solve problems in Python.

Preparation

- Launch the Jupyter notebook.
- Rename the notebook page as "lab12".
- Solution to one problem should occupy one cell.

Please provide solutions to the problems below.

Problem 1

ID	Name	Age	Midterm_1	Midterm_2
1	Alice	19	100	80
2	Bob	21	85	99
3	Caro	20	90	85
4	David	22	77	75

Given the above table:

1) Create a DataFrame, with ID as the index. The columns should be in the exact order as they are in the table.
2) Compute the average of both midterm scores, and save them into a new column, named "Average".
3) Add one more column, named "Major", set Alice and David's major to IT; set Caro's major to Mathematics; set Bob's major to NaN.
4) Replace the index with the names. (You will need to get rid of the Name column after it has been used as index.)

Expect outcomes:

	Name	Age	Midterm_1	Midterm_2	Average	Major
1	Alice	19	100	80	90.0	IT
2	Bob	21	85	99	92.0	NaN
3	Caro	20	90	85	87.5	Mathematics
4	David	22	77	75	76.0	IT

	Age	Midterm_1	Midterm_2	Average	Major
Name					
Alice	19	100	80	90.0	IT
Bob	21	85	99	92.0	NaN
Caro	20	90	85	87.5	Mathematics
David	22	77	75	76.0	IT

Problem 2

Use NumPy's random number generator (randn) and pandas to create a DataFrame that has a shape of 5 by 5. Use only pandas or NumPy functions to solve the following problems:

1) Compute the sum of all the positive numbers and the sum of all the negative numbers.
2) Select all rows having a value exceeding 1.8 or -1.8 3) Drop a row and drop a column.

Expect outcomes:

```
          0         1         2         3         4
0 -0.551642 -0.917440  2.192903 -1.403199  0.819914
1 -1.317458  0.372976 -0.037259  1.046262  1.831721
2 -0.210886  0.869276  1.851818  1.465877  0.642305
3 -1.132067  0.157274 -0.793022 -0.088709  0.323303
4 -0.557636 -0.340715 -0.204136  0.749714  1.260035

The sum of all the positive values: 13.583378195698685
The sum of all the negative values: -7.5541695948812695

Rows that meet the requirement:
          0         1         2         3         4
0 -0.551642 -0.917440  2.192903 -1.403199  0.819914
1 -1.317458  0.372976 -0.037259  1.046262  1.831721
2 -0.210886  0.869276  1.851818  1.465877  0.642305
After dropping the 3rd row:
          0         1         2         3         4
0 -0.551642 -0.917440  2.192903 -1.403199  0.819914
1 -1.317458  0.372976 -0.037259  1.046262  1.831721
3 -1.132067  0.157274 -0.793022 -0.088709  0.323303
4 -0.557636 -0.340715 -0.204136  0.749714  1.260035
After dropping the 2nd column:
          0         2         3         4
0 -0.551642  2.192903 -1.403199  0.819914
1 -1.317458 -0.037259  1.046262  1.831721
2 -0.210886  1.851818  1.465877  0.642305
3 -1.132067 -0.793022 -0.088709  0.323303
4 -0.557636 -0.204136  0.749714  1.260035
```