QF627 Programming and Computational Finance

HWS0305: Data Manipulation and Visualization

(part 2)

**In all the Python programs, we assume students will import Matplotlib, Pandas, Numpy and Scipy as the following:**

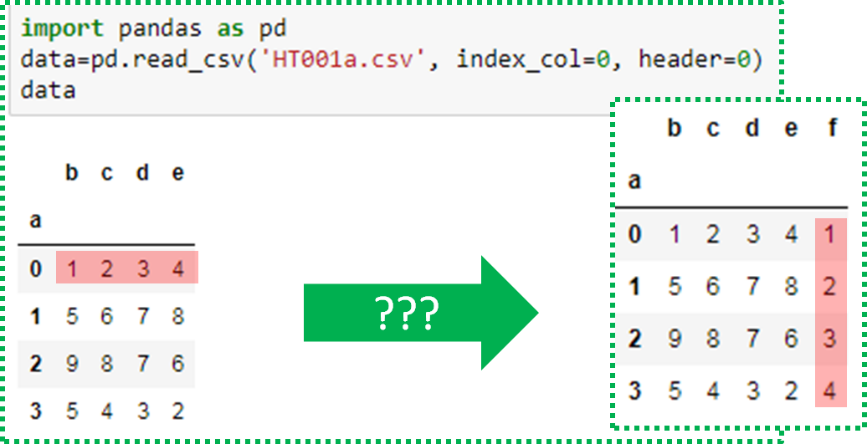
**import matplotlib.pyplot as plt**

**import pandas as pd**

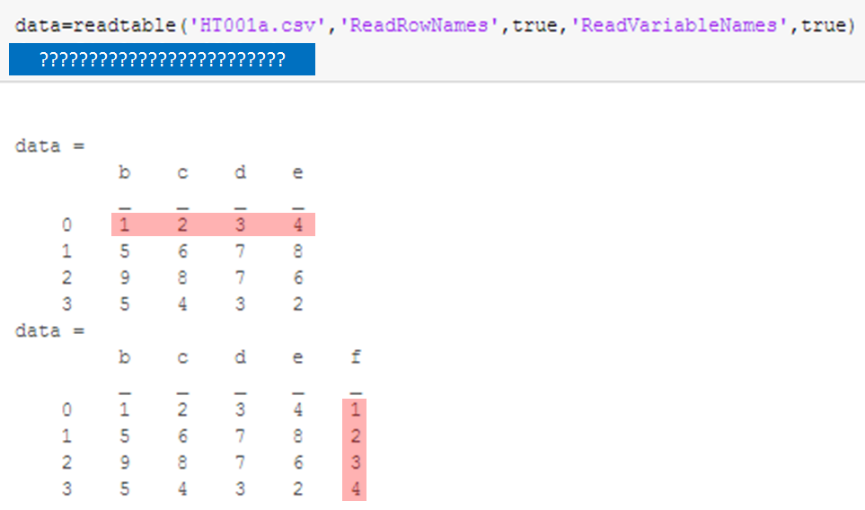
**import numpy as np**

**import scipy.stats as ss**

Q1. (Python) Complete the following code **with one command** to add a column to **data** using the first row of **data**, and name this column **f**.



Q2. (MATLAB) Complete the following code **with one command** to add a column to **data** using the first row of **data**, and name this column **f**.



Q3. (Python) Follow the instructions to complete the computation.

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| 1. **Use one command** with the Pandas library function **pandas.read\_csv** to load data from the CSV file, **dataset01.csv**, using the first row as column names. Name the data as **data**. |
|  |
| 2. Define a function, **option\_BS**, which computes and returns the European call option price using the following formula:  where  and |
|  |
| 3. **Use one command** with the Pandas library function **pandas.DataFrame.apply** to compute the European call option price for each row of **data** and add the results to **data** as a new column, and name this column as **BS**. |
|  |

Q4. (MATLAB) Follow the instructions to complete the computation.

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| 1. **Use one command** to load data from the CSV file, **dataset01.csv**, using the first row as column names. Name the data as **data**. |
|  |
| 2. Define a function, **option\_BS**, which computes and returns the European call option price using the following formula:  where  and |
|  |
| 3. **Use one command** with library function **rowfun** to compute the European call option price for each row of **data** and add the results to **data** as a new column, and name this column as **BS**. |
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