

Duration for this test is 75 minutes

The Business Case

A friend of yours runs a very small coffee corner in the mornings as a side gig. The corner is so small that she sells around 150-200 cups of coffee a month and profits about 150-200 TL as well. She does not want to run out of coffee grounds but also wants fresh coffee so she buys some every month.

You see that her coffee purchase habits are not consistent with what she sells. Besides coffee prices tend to change every month and she might be buying too much when coffee is most expensive and carry expensive inventory over to the next month. You tell her about concepts like demand and supply, inventory carrying costs, economic order quantities, etc but she refuses to change behavior.

Group 1	Group 2
<p>You want to show her that she actually has a foreseeable demand and because she is not ordering coffee to meet demand, she has too much inventory carrying cost.</p> <p>So you will develop a Python program that illustrates</p> <ul style="list-style-type: none">• The mean level of consumption• The mean of inventory carried over to next month• The mean of monthly carried over inventory value	<p>You want to show her that a constant order level Q would be more efficient and still have no risk of running out of coffee.</p> <p>So you will develop a Python program that</p> <ul style="list-style-type: none">• Shows the total amount of coffee ordered and total amount paid now,• Calculates and shows the minimum value for Q, the order quantity that would never run out of inventory• Calculate the total amount of coffee that would be ordered and the total cost for that Q

The Data

The data is really simple. A tab separated text file named Coffee Consumption.txt. There are a number of columns, for each month: The "Bought" column represents coffee in grams, the "Cost" column represents amount paid in TL and the "Consumed" column represents actual coffee consumption at that month in grams. The file has data for 14 months.

Rules and Submission

- All online resources including course notes, sample programs, tutorials, etc are allowed as long as they are not used to cheat.
- You will write a comment on the first line of your program with your name, number, and exam group.
- When you are done, submit your program at ODTUCLASS. After 12:00, you can also download from ODTUCLASS and upload into your Github account for future referral.
- You must use functions in your program. Code with **no functions will get a 20 points penalty.**
- You must use comments to explain your code. Code with **no comments will get a 5 points penalty.**

METU Dept. of Business Administration
BA4318 Business Data Processing with Python
TEST 1 / 29.03.2019
Hints about Python

1. When Pandas tries to read from a CSV file with whitespace delimiters (i.e. spaces and tabs) there is actually an optional parameter for `read_csv()` function to help you.
2. Recall that a DataFrame in Pandas has very neat and functional columns, also called a Series. Each series has some built in functions such as `min()`, `max()`, `mean()`, and `sum()`. So when you need to run these operations on a Series, you can do this very easily, i.e. `df['name'].min()`
3. If you assign a single value to a Pandas Series, all row items in the Series get to be the same value, i.e. `df['Column'] = 0` sets all values in the column to zero.
4. If you want to add a column to a DataFrame, just assign an initial value to a column with a new name, i.e. `df['New'] = 0` creates the column and sets values at the same time.
5. Iterating through Pandas rows is easy with a function called `iterrows()` but you can also convert Series into arrays and iterate over arrays. Both are fine for the course. If you choose `iterrows()`, you should take note that the row you access is a copy, not the original DataFrame. If you want to change data in the DataFrame while using `iterrow()` refer to the original DataFrame.
6. You should round calculated outputs for better display. Use the `round()` function which is trivial in its use, i.e. `roundedvalue = round(calculatedvalue, 2)`

Hints about Inventory levels

1. Every inventory starts at a level of zero before you fill it up for the first time.
2. An order quantity is not enough if the following consumption is more than the accumulated inventory.
3. At a given time, carried inventory is valued at the most current (i.e. latest) unit price.
4. For this exam you don't need any formulas from the Operations Management course.

To self check your outputs. Here are sample results produced by the exam solution.

Group 1	Group 2
Mean level of consumption: 1126.43 Mean level of inventory carried: 1585.71 Mean level of inventory value: 126.5	Actual ordering method ends up ordering 16250 grams coffee at total cost of 1337.55 A constant order level of 1127 results in ordering 15778 grams coffee at total cost of 1291.35