

Assignment on the first part of the course

Elementary Programming – 02318

Preamble:

This assignment will count for 20% of your final grade.

The topics we will cover with this assignment can be found on the **SemesterPlan.pdf** that is available both on [DTU Inside](#) and [Microsoft Teams](#).

Topics go from lesson held on September 3rd 2020 to lesson held September 30th 2020.

Any questions can be addressed to me (emia@dtu.dk) or our TAs.

Deadline:

The deadline is at 8AM on October 28th 2020.

The Problem:

Italy is not as advanced as Denmark. Our customer is a mom and pop store in Giulianova in the Abruzzi region in Central Italy.

They sell fruit and vegetables and they want a system to apply a discount to what they sell. They want also to know how many invoices with discount they are selling.

They sell three types of fruit and vegetables:

- Cucumbers
- Bananas
- Apples

They will update a file called **invoice.txt** with the right information for the program to calculate the discount and the final price. This task is mandatory.

The program will update a file called **stats.txt** where the customer will find number of invoice and how many invoice with discount they have. This is an extra task.

The discount applied is as following:

- If we sell more than 5 cucumbers we will apply a 5% discount
- If we sell more than 9 bananas we will apply a 10% discount
- If we sell between 5 and 9 bananas we will apply a 5% discount
- No discount is applied to apples

The price of fruit and vegetables is given in the file because they change the price, usually weekly depending on how much they pay from their fruit and vegetable resellers.

The program will need to validate the file as well to see if the format expected is correct or not.

The program will accept a file in this format:

GROCERY	QUANTITY	UNITPRICE
1	12	1.4
2	25	1.5
3	65	6.0

Grocery is the type of fruit or vegetables:

- Cucumber is 1
- Bananas is 2
- Apples is 3

Quantity is the number of items per type, in this example we have:

- 12 Cucumbers
- 25 Bananas
- 65 Apples

The Unit Price is the price for a single item.

Without applying the discount, the cost would be the following:

- 12 Cucumbers will cost EUR 124.80
- 25 Bananas will cost EUR 262.50
- 65 Apples will cost EUR 390.00

With discount applied:

- 12 Cucumbers will cost EUR 118.56 (5% discount applied = EUR 6.24)
- 25 Bananas will cost EUR 236.25 (10% discount applied = 26.25)
- 65 Apples will cost EUR 390.00 (no discount applied)

The program will print the following output:

GROCERYTYPE	PRICE	DISCOUNT APPLIED
1	118.56	6.24
2	236.25	26.25

3	390.00	0.00
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Other scenarios for calculating discount and validation:

Scenario No Discount

Given this input file:

GROCERY	QUANTITY	UNITPRICE
1	1	10.4
2	1	10.5
3	1	6.0

This will be the console output:

GROCERYTYPE	PRICE	DISCOUNT	APPLIED
1	10.40		0.00
2	10.50		0.00
3	6.00		0.00

Scenario Discount Bananas between 5 (not included) and 9

Given this input file:

GROCERY	QUANTITY	UNITPRICE
1	1	10.4
2	6	10.5
3	1	6.0

This will be the console output:

GROCERYTYPE	PRICE	DISCOUNT	APPLIED
1	10.40		0.00
2	59.85		3.15
3	6.00		0.00

Scenario Bad Header

Given this input file:

GROCERY	QUANTITY	
1	12	10.4
2	25	10.5
3	65	6.0

This will be the console output:

ERROR Header is wrong

Scenario Bad Type

Given this input file:

GROCERY	QUANTITY	UNITPRICE
1	1	10.4
4	1	10.5
3	1	6.0

This will be the console output:

GROCERYTYPE	PRICE	DISCOUNT	APPLIED
1	10.40		0.00

```
ERROR: found bad grocery type: 4
```

Other scenarios for keeping **stats.txt** updated:

The initial file format is the following (you will find it in the content of the assignments) inside **stats.txt**:

```
INVOICES:      0
WITHDISCOUNT: 0
```

After executing three consecutive times the file from scenario "Scenario No Discount" this will be the updated situation inside **stats.txt**:

```
INVOICES:      3
WITHDISCOUNT: 0
```

After executing three consecutive times the file from scenario "Scenario Discount Bananas between 5 (not included) and 9" this will be the updated situation inside **stats.txt**:

```
INVOICES:      6
WITHDISCOUNT: 3
```

Nothing will be printed on console, the file **stats.txt** will be updated.

How is going to work the evaluation?

The mandatory task to get the 20% is the one regarding calculating from the file the discount and print them in a formatted way.

If you want to do the write to file task about stats.txt you will increase your chances to arrive at 20% if the first part contains some errors.

We will have an online one to one meeting where you explain to me your implementation.

Advices on implementing the tasks

Everything that you have to do here, has for sure something to do with what we studied. Remember that all code done in class is available at

<https://github.com/invasionofsmallcubes/elementary-programming-dtu> and so you can see some examples. Copy and paste is not enough because you will need to explain to me why the code is working that way.