HOMEWORK REPORT

WEEK 05: ASSIGNMENT 04

SHOPPING CART SIMULATION

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Contents

List of Figures
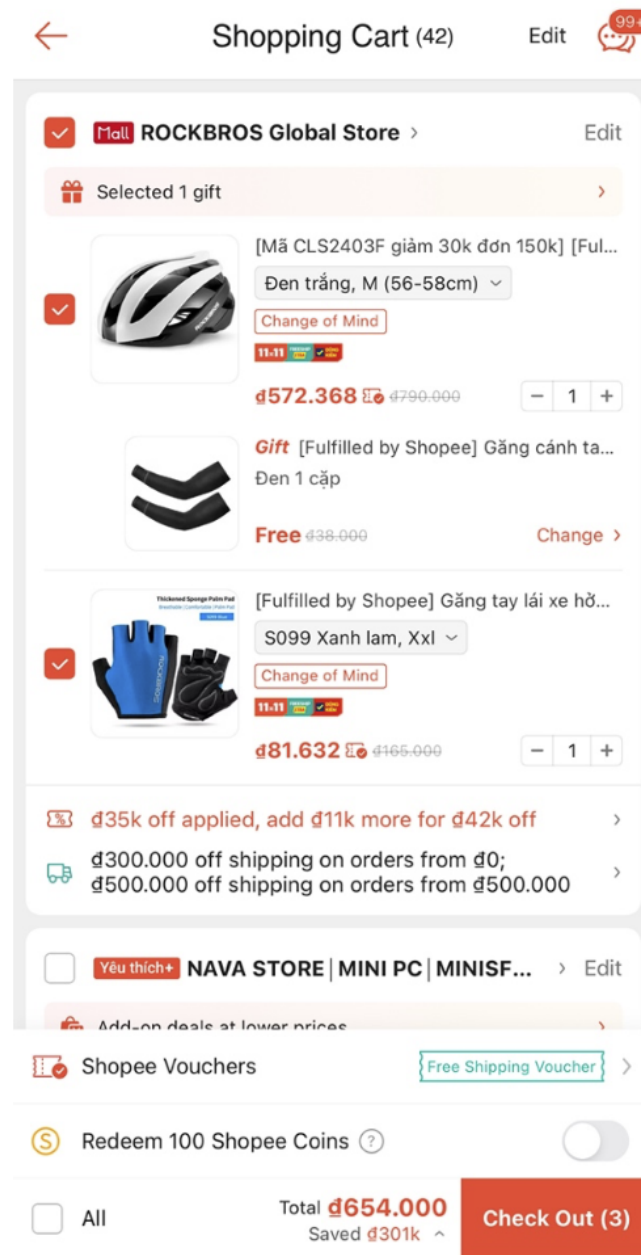
1 Shopping cart simulation solution

Figure 1: Shopee's cart image

Continue with the lab in week 3, in this lab, students are asked to write a simple console application in C++ to simulate the Shopee's cart with 3 new requirements:

- Product information will be loaded from a text file.[2.4.2]

- Orders will be saved to a text file.[2.4.2]

- Support one types of promotion.[2.2, 2.4.2]

2 Coding

2.1 Class Diagram

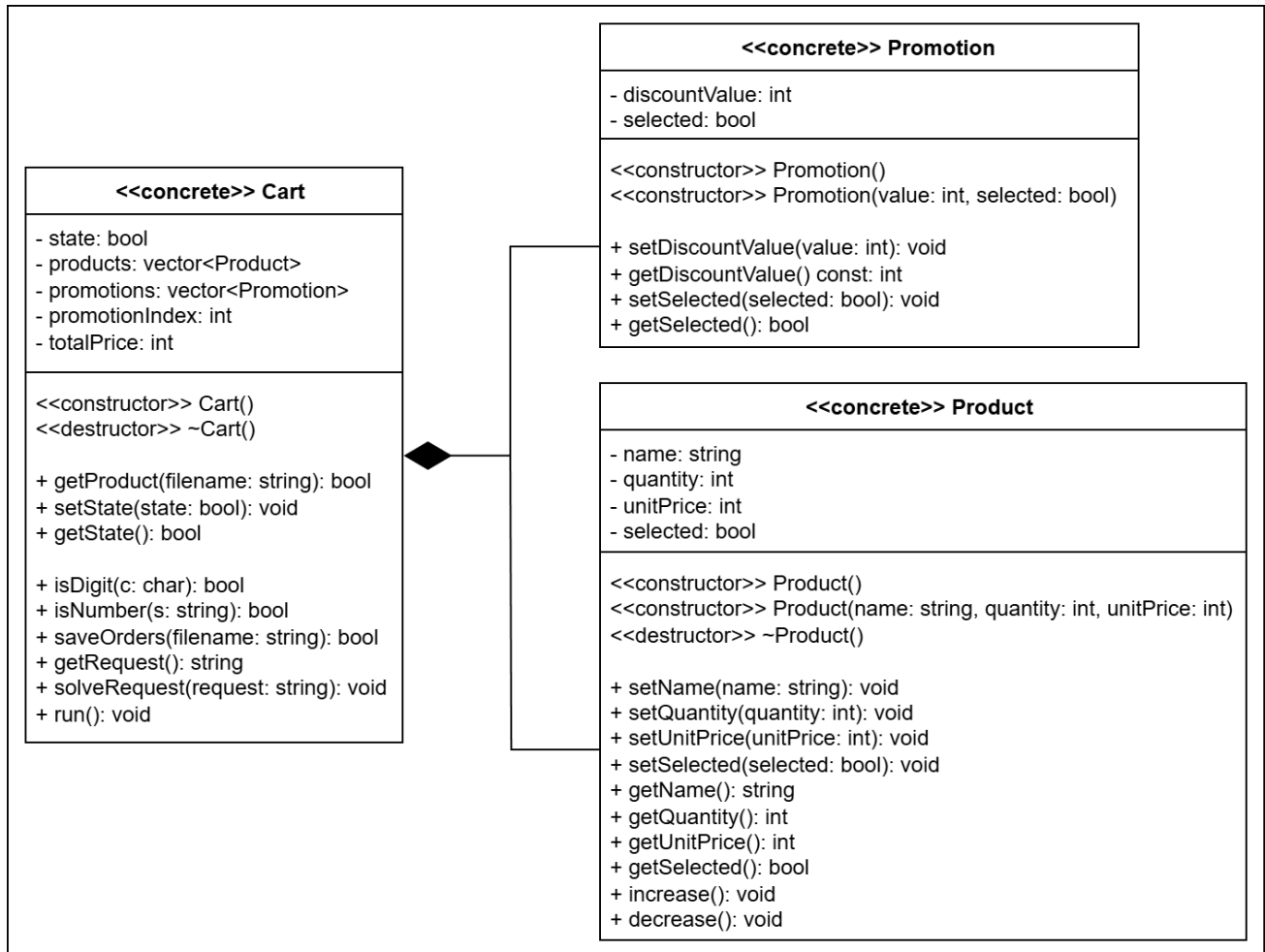In this lab, I created 3 classes: `Promotion`, `Product` and `Cart`.

Figure 2: Class Diagram

2.2 Class `Promotion`

2.2.1 Data member

The private section includes an integer to represent the discount value (%) and a boolean variable to indicate its selection state.

2.2.2 Methods

It includes constructors, along with getter and setter.

2.3 Class `Product`

2.3.1 Data member

The private section includes attributes such as the name, quantity, and unit price of a product, along with a boolean variable to indicate its selection state.

2.3.2 Methods

- Constructor: default and parameterized constructor.

- Destructor.

- Functions to set the value of the attributes: `setName()`, `setQuantity()`, `setUnitPrice()`, `setSelected()`.

- Functions to get the value of the attributes: `getName()`, `getQuantity()`, `getUnitPrice()`, `getSelected()`.

- Functions to modify the quantity of a product: `increase()`, `decrease()`.

2.4 Class `Cart`

2.4.1 Data member

The private section includes 5 attributes:

- A list of products.

- A list of promotions.

- Selected promotion's index.

- The total price of all selected products based on their quantities.

- A boolean variable indicates its state to check if it is running or stopped.

2.4.2 Methods

- Default constructor.

- Destructor.

- `getProduct()`: Read and get the data of products in the cart from a file.
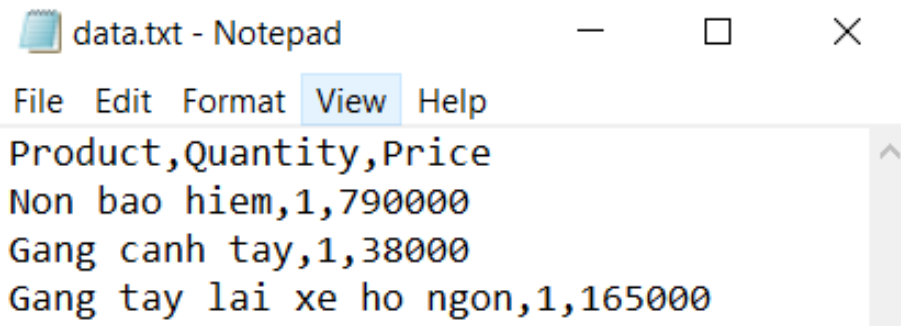
Figure 3: Load products from a text file

- Deal with running state: `setState()`, `getState()`.

- Deal with strings that have number: `isDigit()`, `isNumber()`.

- `saveOrders()`: Once purchased products successfully, save the current purchased order to a text file called orders.txt and erase the purchased items from the cart.
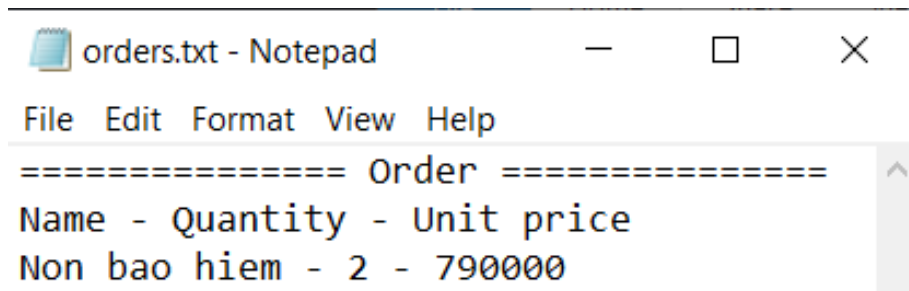

Figure 4: Save orders to a text file

- `getRequest()`: Print the simulated Shopee's cart and provide the user with options. Ask the user to input the selection based on the provided format. We can see the options and their input format in the image below. Please only choose 1 product each time.

Figure 5: Simulated Shopee's Cart

- `solveRequest()`: Read the request and solve it. If the option is not exit or purchase, the input request line will have 2 parts: object and action separated by '|'. There are 8 cases:

  - Exit if the input line is "e".

  - Purchase if the input line is "p". However, the user can't purchase if the cart is empty or none of the products is selected. Then, the user is asked to select or product or input "e" to to exit.

  - If the object part is "voucher", the action will indicate the index of the selected voucher (start from 0).

```
================================ SHOPEE CART ================================
Selected   Products                                          Quantity              Price
----------------------------------------------------------------------------------------
x          Non bao hiem                                      2              790000 VND
           Gang canh tay                                     1               38000 VND
           Gang tay lai xe ho ngon                           1              165000 VND


----------------------------------------------------------------------------------------
Vouchers:
10%, 20%, 30%, 40%, 50%
Selected: None!


----------------------------------------------------------------------------------------
Total Prices: 1580000 VND
----------------------------------------------------------------------------------------
Please select an option:
1. Increase / decrease the quantity of a product: <product>|<key '+' / '-'>     Ex: Keyboard|+
2. Remove a product: <product>|<key 'x'>         Ex: Keyboard|x
3. Change the number of a product: <product>|<number>    Ex: Keyboard|6
4. Select / unselect a product: <product>|<key 's'>      Ex: Keyboard|s
5. Select / change voucher: voucher|<index - start from 0>        Ex: voucher|1
6. Purchase: key 'p'
7. Exit: key 'e'
----------------------------------------------------------------------------------------
Your selection: voucher|1

================================ SHOPEE CART ================================
Selected   Products                                          Quantity              Price
----------------------------------------------------------------------------------------
x          Non bao hiem                                      2              790000 VND
           Gang canh tay                                     1               38000 VND
           Gang tay lai xe ho ngon                           1              165000 VND


----------------------------------------------------------------------------------------
Vouchers:
10%, 20%, 30%, 40%, 50%
Selected: 20%


----------------------------------------------------------------------------------------
Total Prices: 1264000 VND
----------------------------------------------------------------------------------------
Please select an option:
1. Increase / decrease the quantity of a product: <product>|<key '+' / '-'>     Ex: Keyboard|+
2. Remove a product: <product>|<key 'x'>         Ex: Keyboard|x
3. Change the number of a product: <product>|<number>    Ex: Keyboard|6
4. Select / unselect a product: <product>|<key 's'>      Ex: Keyboard|s
5. Select / change voucher: voucher|<index - start from 0>        Ex: voucher|1
6. Purchase: key 'p'
7. Exit: key 'e'
----------------------------------------------------------------------------------------
Your selection: █
```

Figure 6: Support 1 type of promotion

– If the action part is '+': increase the quantity of the product by 1.

– If the action part is '-': decrease the quantity of the product by 1. Remove the product

if the quantity is less than 1.

- – If the action part is 'x': remove the product from the cart.

- – If the action part is 's': select the product or unselect the product if it is selected.

- – If the action part is a number: change the quantity of the product to that number. If the number is less than 1, remove that product.

If the product in the request is not in the Cart, the program announces it and do nothing because the Shopee's cart only deal with products in the cart.

- `run()`: Run the program by getting the requests and solve them while the running state is `false`.