VNUHCM - UNIVERSITY OF SCIENCE

FACULTY OF INFORMATION TECHNOLOGY

HOMEWORK REPORT

WEEK 03: ASSIGNMENT 06

SHOPPING CART SIMULATION

Instructor:
Nguyen Le Hoang Dung
Ho Tuan Thanh

Student:
Le Trung Kien   23127075   23CLC08

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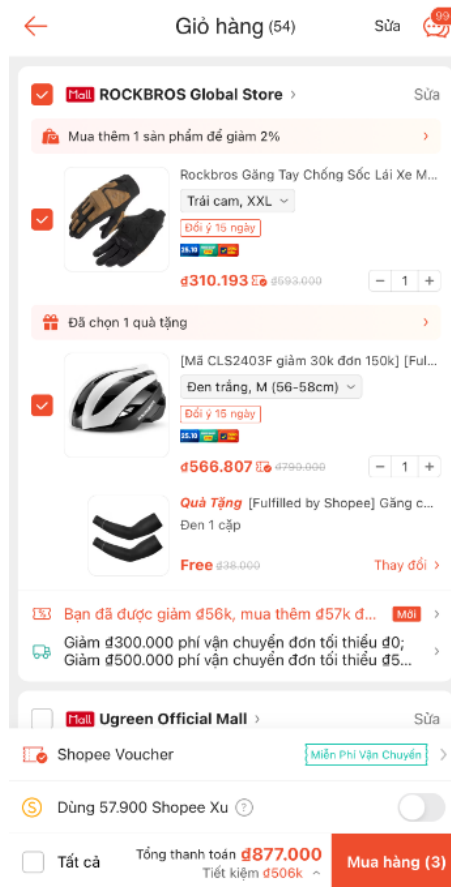
1 Shopping cart simulation solution

Figure 1: Shopee's cart image

In this lab, students are asked to simulate the given screens. The shown image illustrates the shopping cart of an application called "Shopee". In addition, students are supposed to focus on products, quantities, unit prices, and the total price. Other features will be the focus of the following weeks. Therefore, in this project, I decided to concentrate on 7 operations:

- Increase the quantity of a product: acts as the button (+).

- Decrease the quantity of a product: acts as the button (-).

- Remove a product: you can view it in the Shopee's cart by selecting "Fix" or "Sua" on the top-right conrner.

- Change the number of a product: the box which is between the 2 buttons (-) and (+).

- Select / unselect a product: the box on the left of the image of the product.

- Purchase: acts as the orange button "Mua hang".

- Get back or exit.

2 Coding

2.1 Class Diagram

In this lab, I created 2 classes: `Product` and `Cart`. The relationship between them is aggregation because `Product` is a part of `Cart`, but it can exist independently.

Figure 2: Class Diagram

2.2 Class `Product`
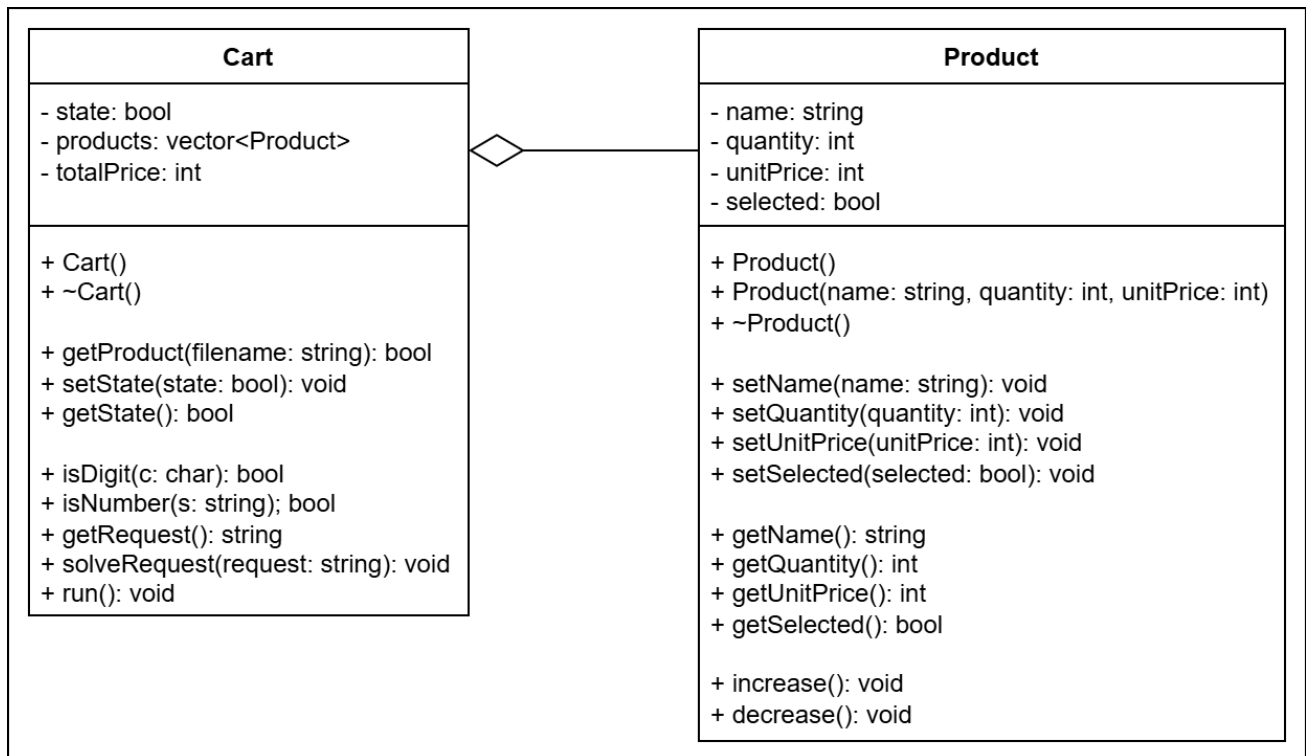
2.2.1 Data member

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.

2.2.2 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()`.

2.3 Class `Cart`

2.3.1 Data member

The private section includes 3 attributes:

- A list of products

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

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

2.3.2 Methods

- Default constructor.

- Destructor.

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

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

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

- `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.


```
=================================== SHOPEE CART ===================================
Selected  Products                                        Quantity              Price
-----------------------------------------------------------------------------------
          Rockbros Gang tay chong soc lai xe motor        1                319193 VND
x         Con chuot gaming                                1                566807 VND
          Qua tang                                        1                      Free


-----------------------------------------------------------------------------------
Total Prices: 566807 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. Purchase: key 'p'
6. Exit: key 'e'
-----------------------------------------------------------------------------------
Your selection: Con chuot gaming|+
```

Figure 3: 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: product and action separated by '|'. There are 7 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 products is selected. Then, the user is asked to select or product or input "e" to to exit.
  - 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.
  - 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 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`.