

INVENTORY MANAGEMENT TOOL

CO2203 Object Oriented Programming Mini Project

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Introduction

From small businesses to very large companies, tidying up and organizing a messy inventory is not a small task. Every businessman knows that inventory out means money in. It is that simple. But without a clear view of goods, the company's largest asset could be losing money.

The key to a profitable and efficient business is total visibility into the inventory process from start to finish. An effective inventory management system helps the company streamline all the moving parts of its warehouse, along with management tools to help to maintain optimal stock levels year-round.

Motivation

When considering business failures, inventory mismanagement is one of the top reasons among them. Inefficient inventory management can affect the company's profitability in several ways.

- Too much stock – Having more goods on hand than you need is a risk since it can cost you. Sometimes you may need to pay for storage, which is expensive, and also perishable items can spoil before you can sell them.
- Too little stock – Company's customer base may get reduced if you don't have what they want. To maintain regular customers, you may need to provide what they want. Otherwise, customers will get used to other stores.
- Too old stock – If the items are not sold for a long time, their expiry dates may be close and therefore there is a chance that they can spoil. If the items got spoiled, it's a loss for the company.

Furthermore, maintaining inventories with pen-and-paper is a dying process prone to error.

In order to reduce the losses that can happen from the above type of ways, the best thing is to have an Inventory Management Tool. It can be either a simple one or a more advanced one depending on your needs. But purchasing an inventory management software may cost you more than you expect. Therefore, as a cheap way to manage your inventory, we have designed a simple inventory management tool for you.

Objectives

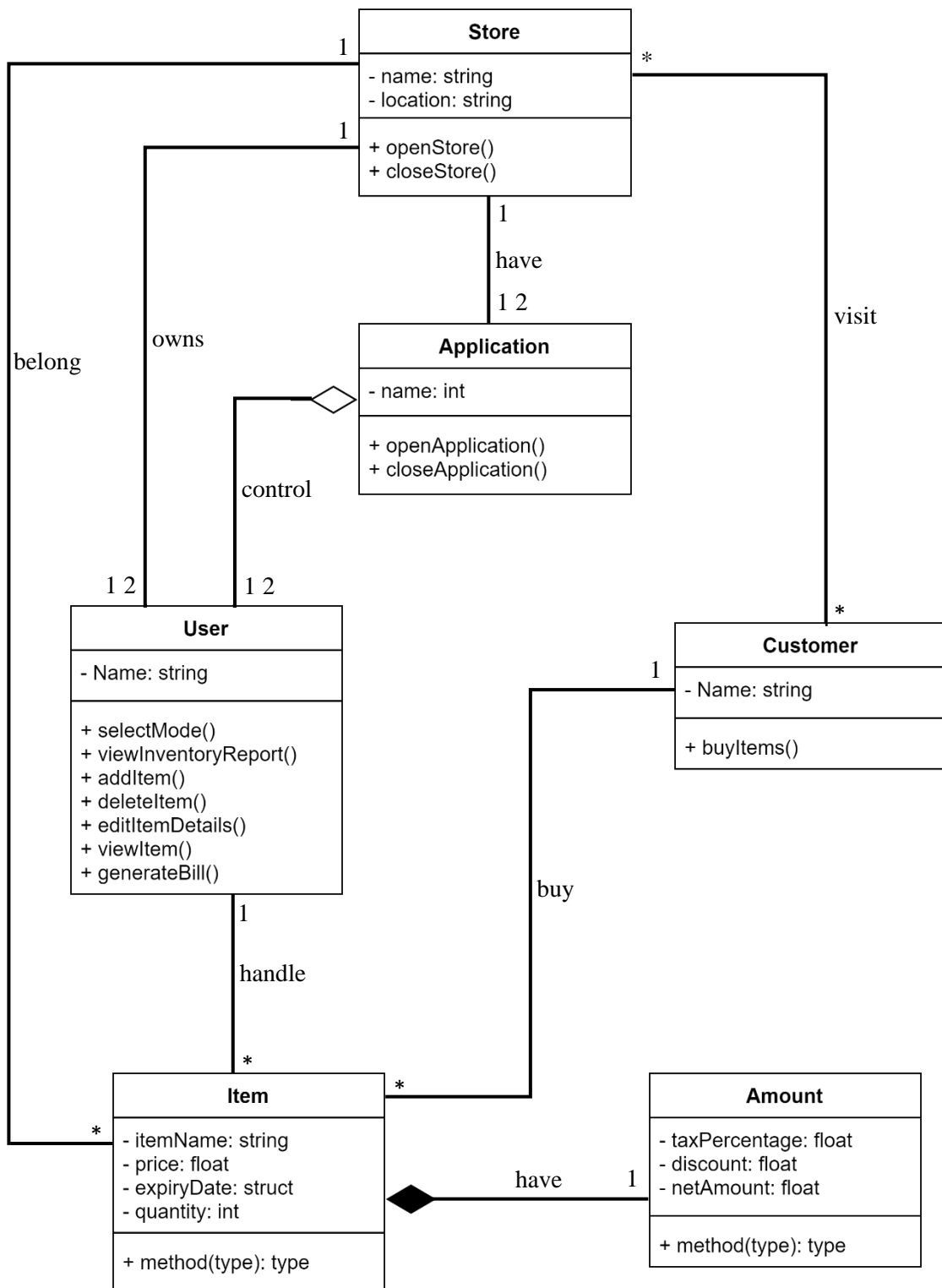
A business owner can use an inventory management system to run their business effectively to overcome the above-mentioned issues. We have designed an inventory management tool mainly to keep track of the items available in the store.

As we are a group of undergraduate students at a university, we have designed our software to work in an Education mode to learn about the Classes related to Object Oriented Programming concepts by displaying the class names when an object is created.

Here are some key objectives covered by our Inventory Management Tool,

- Enter the items along with the following attributes;
 - ✓ Item No
 - ✓ Item Name
 - ✓ Quantity
 - ✓ Expiry Date
 - ✓ Retail Price
 - ✓ Tax Percentage
 - ✓ Discount Percentage
- View the above details of an already existing item available at the store.
- Delete an item by entering its item number.
- View the list of all the available items at the store along with their total value.
- Generate a bill when a customer purchases items

Class Diagrams



Project Overview

As shown in class diagrams, we have used different classes for convenience.

- A user owns the store.
- A store can have one or two Inventory Management Tool applications.
- The user controls the application software.
- All the items belong to the store.
- All the items have an amount.
- Items can be handled by the user through the application.
- Customers can buy items.
- Customers can visit many stores.

To view the code in GitHub, [click here](#).

Screenshots of the Application

a. Using Regular Mode

Main menu

```
REG_MOD:ON
          Super Market Inventory Manage System
          =====

1.Select Mode
2.Inventory Report
3.Add/Remove/Edit Item
4.Show Item Details In Inventory
5.Generate Bill
6.Exit

Please Enter Required Option: 1
```

1) Select Mode option

```
          Choose Mode
          =====

1.Education Mode
2.Regular Mode
3.Back to Main Menu |
```

2) Inventory Report option

```
REG_MOD:ON
          Inventory Details
          =====

1.All Items
2.Back to Main menu

Please Enter Required Option:
```


2.1) [All Items option](#)

REG_MOD:ON						
INVENTORY DETAILS						
ITEM NO	NAME	PRICE	QUANTITY	TAX %	DISCOUNT %	NET AMOUNT
2	Face_Wash	350.00	2.00	15.00	5.00	764.75
3	Hair_Gel	270.00	1.00	15.00	0.00	310.50
Grand Total=1075.25						

3) [Add/Remove/Edit Item option](#)

```
REG_MOD:ON
Inventory Editor
=====

1.Add Item Details
2.Edit Item Details
3.Delete Item Details
4.Back to Main Menu |
```

3.1) [Add Item Details option](#)

```
Item No: 1

Name of the item: Perfume

Expired Date(dd-mm-yy): 31-12-2024

Price: 480

Quantity: 1

Tax percent: 20

Discount percent: 0|
```

3.2) [Edit Item Details option](#)

```
Current Details are
Item No: 1

Name of the item: Perfume

Date : 31--12--2024

Net amount: 576.00

Enter New Details

Item No: 1

Name of the item: Mens_Perfume

Expired Date(dd-mm-yy): 29-11-2024

Price: 500

Quantity: 1

Tax percent: 20

Discount percent: 10

Item Added Successfully!
Item Details edited|
```

3.3) [Delete Item Details option](#)

```
Enter Item Number to be deleted :1|
```

4) [Show Item Details In Inventory](#)

```
REG_MOD:ON

Enter Item Number :1

Item No: 1
Name of the item: Perfume
Date : 31--12--2024
Net amount: 576.00

*****
DETAILS
*****

PRICE                      :480.00

QUANTITY                   :1.00
TAX PERCENTAGE             :20.00
DISCOUNT PERCENTAGE      :0.00

NET AMOUNT                 :Rs.576.00
*****
```

5) [Generate Bill option](#)

```
1.Add Item From Inventory
2.Generate Bill
3.Clear Bill
4.Back
Please Enter Required Option: |
```

5.1) [Add Item From Inventory option](#)

```
REG_MOD:ON
          Bill
          =====

ITEM NO   NAME      QUANTITY  PRICE
2         Face_Wash  2.00      764.75
3         Hair_Gel   1.00      310.50

          1.Add Item From Inventory
          2.Generate Bill
          3.Clear Bill
          4.Back

          Please Enter Required Option: 1

          Enter Item NO:|
```

5.2) [Generate Bill option](#)

```
          Bill
          =====

ITEM NO   NAME      QUANTITY  PRICE
2         Face_Wash  2.00      764.75
3         Hair_Gel   1.00      310.50

          -----
          1075.25
          -----

          1.Add Item From Inventory
          2.Generate Bill
          3.Clear Bill
          4.Back

          Please Enter Required Option: 2

          Wait A Second...Generating Bill..|
```

5.2.1) Text File of the generated bill

```
*bill1 - Notepad
File Edit View

Super Market bill
=====

ITEM NO      NAME      QUANTITY      PRICE
2            Face_Wash      2            764.75
3            Hair_Gel      1            310.5

*****
TOTAL = Rs.1075.25
*****
***** THANKS *****
```

b. Using Education Mode

```
EDU_MOD:amount-report ← Function Name

INVENTORY DETAILS

ITEM NO  NAME      PRICE      QUANTITY  TAX %  DISCOUNT %  NET AMOUNT
2        Face_Wash 350.00      2.00      15.00      5.00      764.75
3        Hair_Gel 270.00      1.00      15.00      0.00      310.50

Grand Total=1075.25|
```

```
EDU_MOD:amount-add ← Function Name
Inventory Editor
=====

1.Add Item Details
2.Edit Item Details
3.Delete Item Details
4.Back to Main Menu 1

Item No: |
```

EDU_MOD:amount-show ← Function Name

Enter Item Number :2

Item No: 2

Name of the item: Face_Wash

Date : 8--11--2024

Net amount: 764.75

DETAILS

PRICE :350.00

QUANTITY :2.00

TAX PERCENTAGE :15.00

DISCOUNT PERCENTAGE :5.00

NET AMOUNT :Rs.764.75

*****|

Usability

Here are some examples of where this Inventory Management Tool can be used.

- Pharmacies and drugstores
- Health and Beauty care shops
- Food and Beverage shops
- Supermarkets
- Online shopping platforms

Future Improvements

- Add a feature to sort the items in ascending or descending order by following attributes,
 - ✓ By name - to easily find an item within the list
 - ✓ By price - to identify the value of the items
 - ✓ By expiry date - to easily find the items which expire soon
- Store the price history of items – To analyze the price change of items
- Use graphical user interfaces – To make the application more familiar to the users
- Use a database system
- Use a password-protected system – To secure the business
- Use a barcode system for items – To avoid adding items by item number

Group Member Details

20/ENG/016 – BUWANEKA R.I (CO)

Code - 25%

Report - 25%

Presentation - 25%

Video - 25%

20/ENG/061 – JAYASINGHE M.A.R.D (CO)

Code - 25%

Report - 25%

Presentation - 25%

Video - 25%

20/ENG/063 – JAYATHILAKA H.A.N.D (EE)

Code - 25%

Report - 25%

Presentation - 25%

Video - 25%

20/ENG/015 – BATUWATTA A.S (EE)

Code - 25%

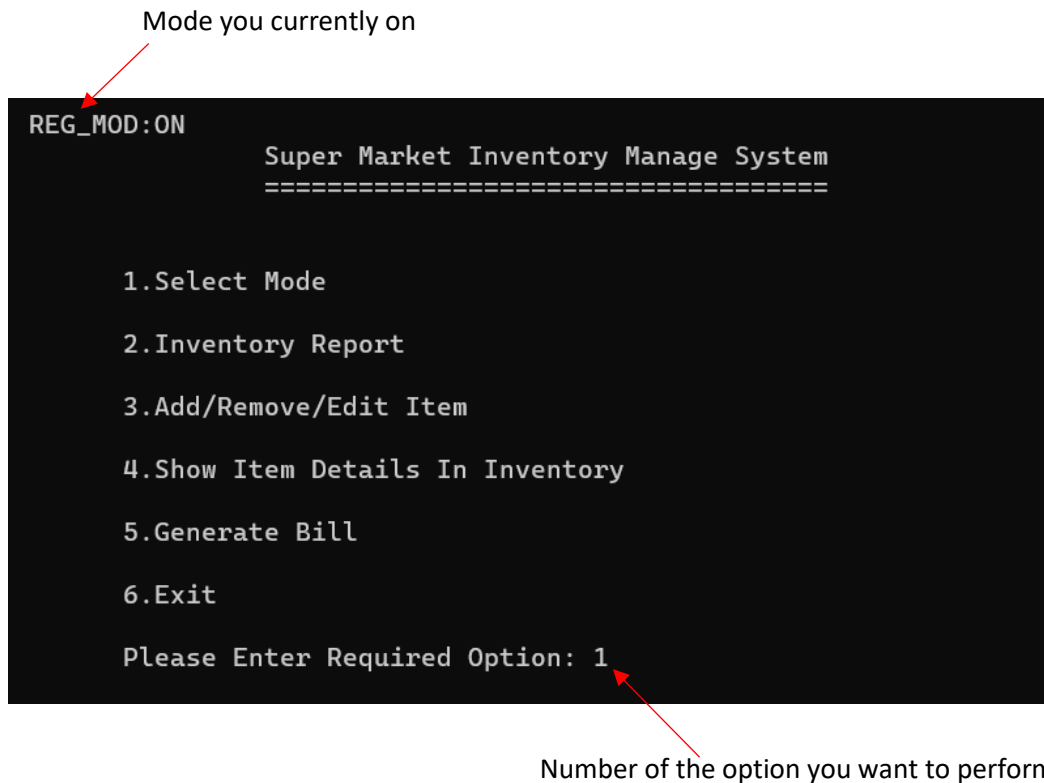
Report - 25%

Presentation - 25%

Video - 25%

Annexure – User Manual

The first interface you will see is the Main menu. You can select the option you want to perform and enter the relevant number.



Option 1 – Select Mode

From here you can select the option you desire. There are two modes.

1. **Education Mode** – Each member function produces the function name. For example, when an object is created from class `classA`, the constructor of the class prints 'classA-Constructor'.

2. **Regular Mode** – This mode does not indicate the function names.

Note: If the user doesn't select a mode at the beginning, the application will automatically select the default mode as Regular Mode.

Option 2 – Inventory Report

When the user wants to see all the items available in the store, the user can select this option and then select '**1. All items**'. It will display all the items with their details. In the end, it will display the total value of the items available in the store.

REG_MOD:ON						
INVENTORY DETAILS						
ITEM NO	NAME	PRICE	QUANTITY	TAX %	DISCOUNT %	NET AMOUNT
1	Perfume	480.00	1.00	20.00	0.00	576.00
Grand Total=576.00						

To go back, press Enter.

Option 3 – Add/Remove/Edit Item

1. Add Item Details

If the user wants to add a new item to the store, this option must be chosen. Then the item can be added to the inventory by providing the relevant details.

Note: All the prices are in LKR. Percentage values must be provided for taxes and discounts.

Note: If the item name consists of two words or more, please use 'Camel Lettering' or an underscore (_) or a dot (.) instead of a space.

2. Edit Item Details

If the user wants to edit the details of an existing item, this option must be chosen. By providing the 'Item No', the user can enter the new details of the item. User can see the already existing details at the top.

```
Current Details are
Item No: 1

Name of the item: Perfume

Date : 31--12--2024

Net amount: 576.00

Enter New Details

Item No: 1

Name of the item: Mens_Perfume

Expired Date(dd-mm-yy): 29-11-2024

Price: 500

Quantity: 1

Tax percent: 20

Discount percent: 10

Item Added Successfully!
Item Details edited|
```

3. Delete Item Details

If the user wants to delete an item from the inventory system, this option must be chosen. You can delete the already existing item by providing the 'Item No'.

Note: If you are using the Inventory System Tool for the first time, please enter the items into the inventory before selecting 'Edit Items' or 'Delete Items'. Otherwise, it will automatically return to the previous menu.

Option 4 – Show Item Details In Inventory

If the user wants to view the details of a single item in the store which have been already added to the system, this option must be chosen.

```
REG_MOD:ON

Enter Item Number :1

Item No: 1
Name of the item: Perfume
Date : 31--12--2024
Net amount: 576.00

*****
                        DETAILS
*****

PRICE                      :480.00

QUANTITY                   :1.00
TAX PERCENTAGE             :20.00
DISCOUNT PERCENTAGE      :0.00

NET AMOUNT                 :Rs.576.00
*****
```

To go back, press Enter.

Option 5 – Generate Bill

When a customer purchase items from the shop, you can generate a bill by entering the item number of the items that the customer bought.

There are three sub-options under this option.

1. Add Item From Inventory

You can add items to the bill one by one by selecting this option each time.

```
REG_MOD:ON
          Bill
          =====
ITEM NO   NAME      QUANTITY  PRICE
2         Face_Wash 2.00      764.75
3         Hair_Gel  1.00      310.50

          1.Add Item From Inventory
          2.Generate Bill
          3.Clear Bill
          4.Back

          Please Enter Required Option: 1

          Enter Item NO:|
```

2. Generate Bill

After adding all the items customer purchased, by selecting the ‘Generate Bill’ option, you can get the total amount and generate a text document for the bill. If you want the bill in printed form, you can use this text document.

```
Bill
=====

ITEM NO    NAME        QUANTITY  PRICE
2          Face_Wash  2.00      764.75
3          Hair_Gel   1.00      310.50

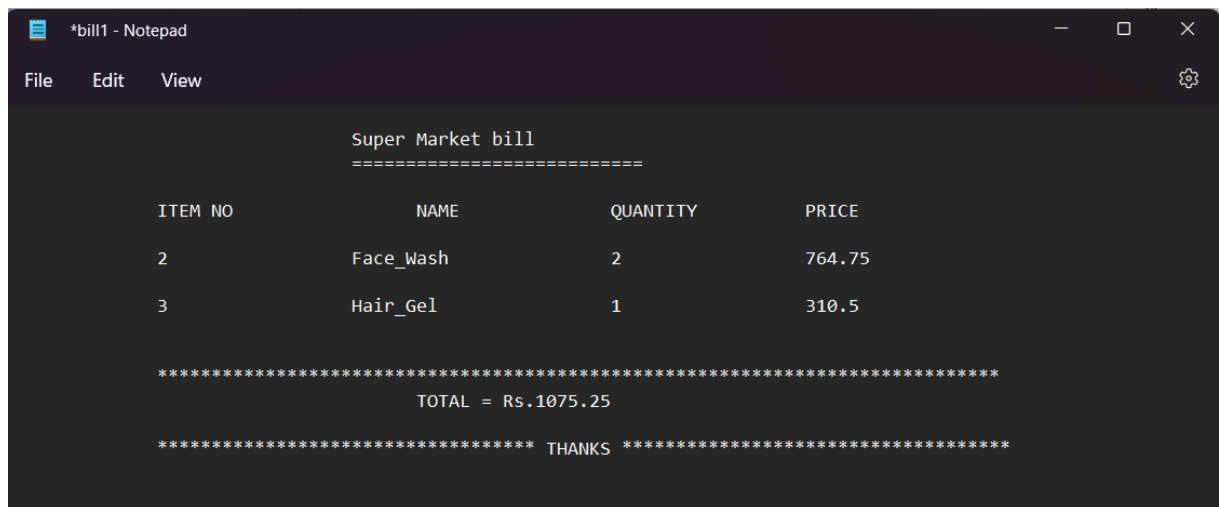
-----
1075.25
-----

1.Add Item From Inventory
2.Generate Bill
3.Clear Bill
4.Back

Please Enter Required Option: 2

Wait A Second...Generating Bill..|
```

The text document will look like this.



3. Clear Bill

If you don't want to generate a text file for the bill, you can clear the items you already added by selecting the 'Clear Bill' option.

Option 6 – Exit

If you want to exit from the application, select 'Exit'.