Objective:

- Files based application
- Use of Dictionary
- Conditional and Control Statements
- Passing values in functions and functions returning values
- Search and display data
- Displays formatted information in the form of report display

Introduction:

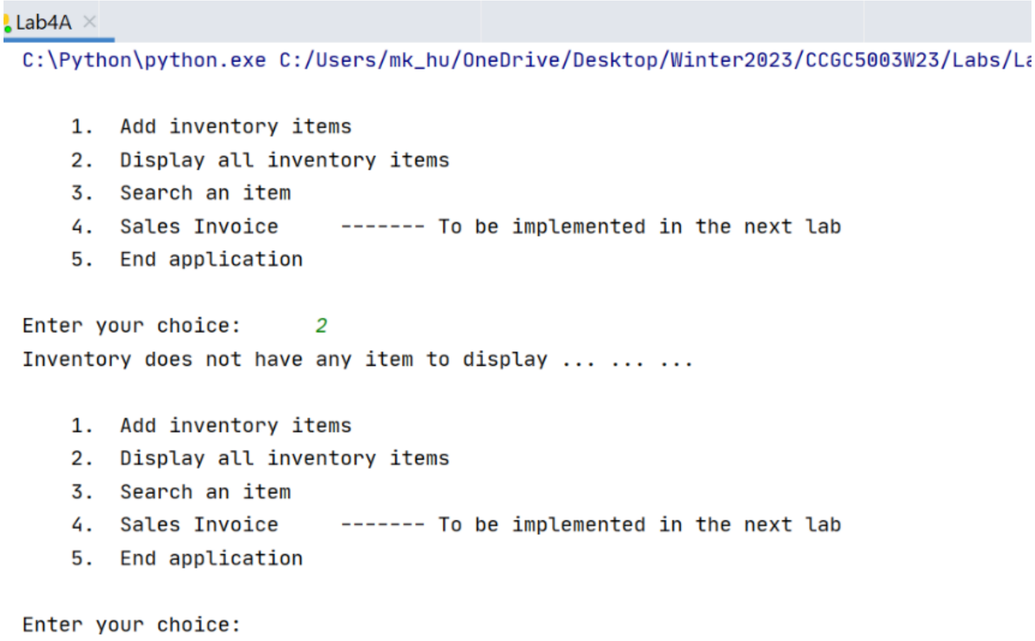
Non-volatility of inventory storage is important that once application ends, inventory items still are kept in storage and these items may be available after the application runs again.

This application is implemented to check items in the inventory, add items, display all items, search specific items and it requires item's serial number (or item code) to search an item. Information about the item that is stored in the inventory includes item name, item serial number/code, number of items in the inventory and the price per item in the inventory.

This application uses dictionary to store inventory application and once validity of item is confirmed the dictionary of item is saved in file.

Application execution:

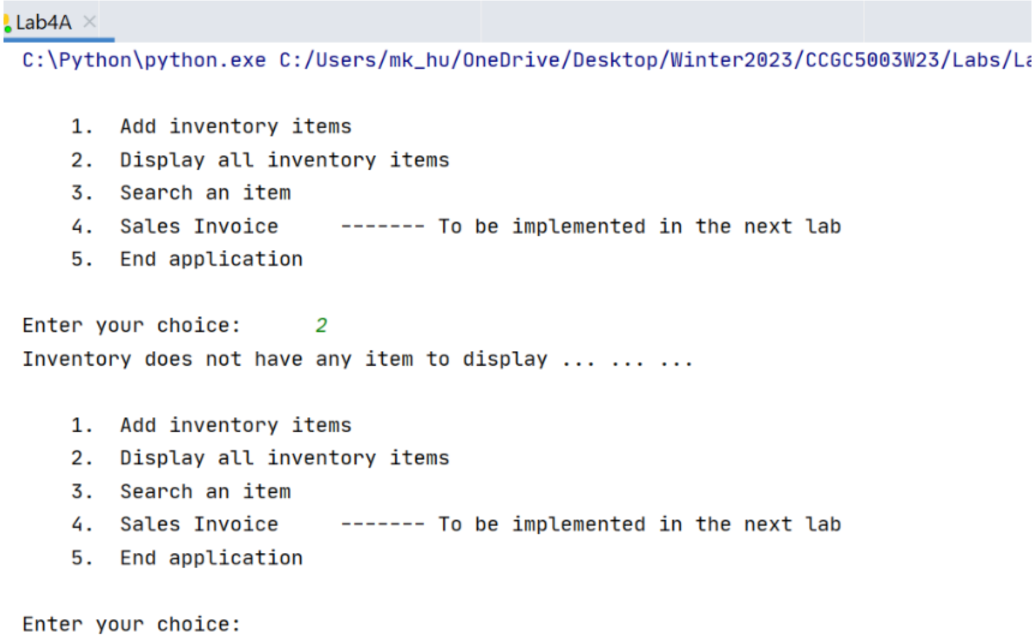
Menu options are displayed until user chooses to end the application. Following shows the menu options:



```
C:\Python\python.exe C:/Users/mk_hu/OneDrive/Desktop/Winter2023/CCGC5003W23/Labs/La

    1.  Add inventory items
    2.  Display all inventory items
    3.  Search an item
    4.  Sales Invoice     ------- To be implemented in the next lab
    5.  End application

Enter your choice:      2
Inventory does not have any item to display ... ... ...

    1.  Add inventory items
    2.  Display all inventory items
    3.  Search an item
    4.  Sales Invoice     ------- To be implemented in the next lab
    5.  End application

Enter your choice:
```

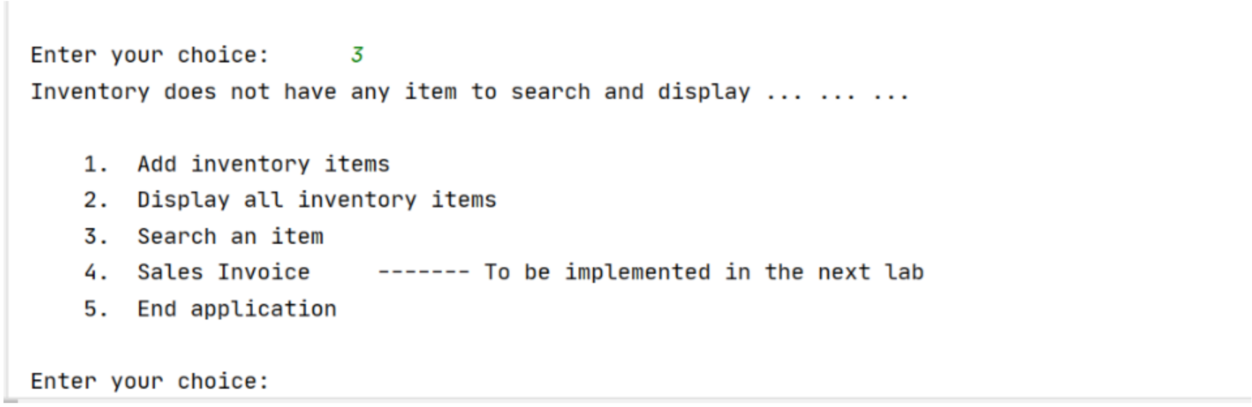
Note that option 4 (Sales Invoice) will be implemented later.

First of all, when data is NOT stored in the inventory (file), following is displayed when choosing option 2:



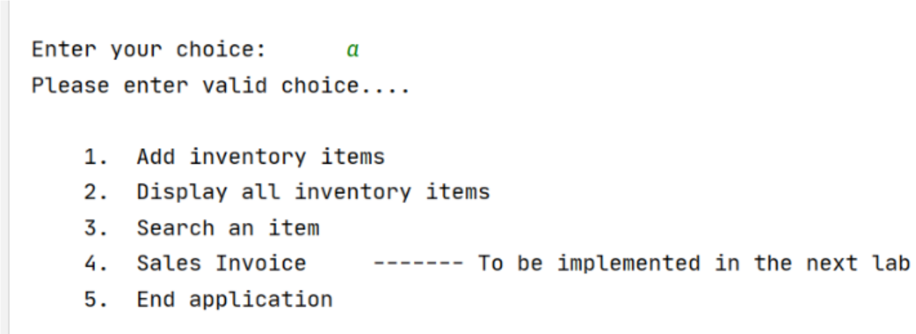
```
C:\Python\python.exe C:/Users/mk_hu/OneDrive/Desktop/Winter2023/CCGC5003W23/Labs/La

    1.  Add inventory items
    2.  Display all inventory items
    3.  Search an item
    4.  Sales Invoice     ------- To be implemented in the next lab
    5.  End application

Enter your choice:      2
Inventory does not have any item to display ... ... ...

    1.  Add inventory items
    2.  Display all inventory items
    3.  Search an item
    4.  Sales Invoice     ------- To be implemented in the next lab
    5.  End application

Enter your choice:
```

If user chooses option 3 (search an item by Item code), and there are no items in the inventory, following is displayed:



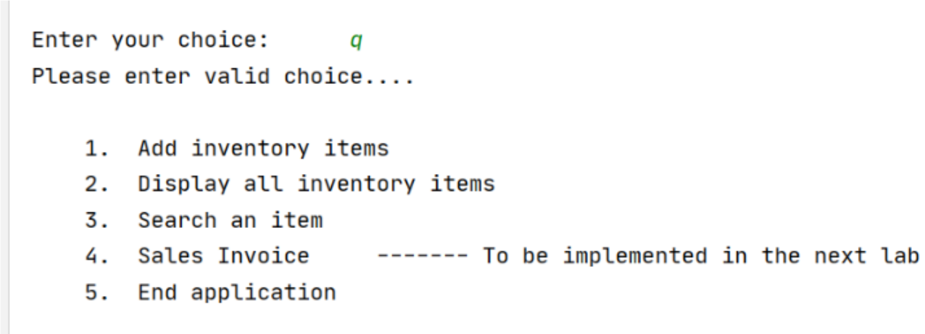
```
Enter your choice:      3
Inventory does not have any item to search and display ... ... ...

    1.  Add inventory items
    2.  Display all inventory items
    3.  Search an item
    4.  Sales Invoice     ------- To be implemented in the next lab
    5.  End application

Enter your choice:
```

If user enters invalid option, numeric value or non-numeric character, following is displayed:



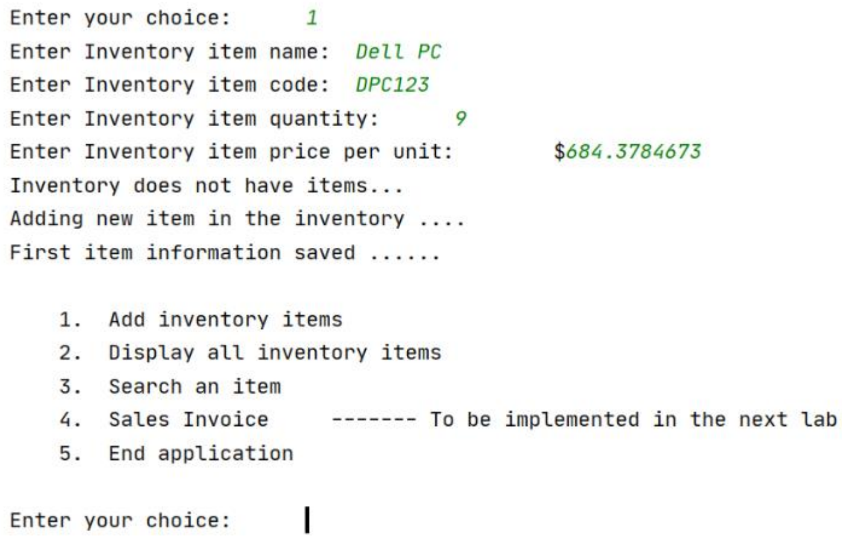
```
Enter your choice:      a
Please enter valid choice....

    1.  Add inventory items
    2.  Display all inventory items
    3.  Search an item
    4.  Sales Invoice     ------- To be implemented in the next lab
    5.  End application
```

You may observe the message (Please enter valid choice).



```
Enter your choice:      q
Please enter valid choice....

    1.  Add inventory items
    2.  Display all inventory items
    3.  Search an item
    4.  Sales Invoice     ------- To be implemented in the next lab
    5.  End application
```

When user chooses option 1 to add an item, following is displayed:



```
Enter your choice:      1
Enter Inventory item name:  Dell PC
Enter Inventory item code:  DPC123
Enter Inventory item quantity:      9
Enter Inventory item price per unit:        $684.3784673
Inventory does not have items...
Adding new item in the inventory ....
First item information saved ......

    1.  Add inventory items
    2.  Display all inventory items
    3.  Search an item
    4.  Sales Invoice     ------- To be implemented in the next lab
    5.  End application

Enter your choice:
```

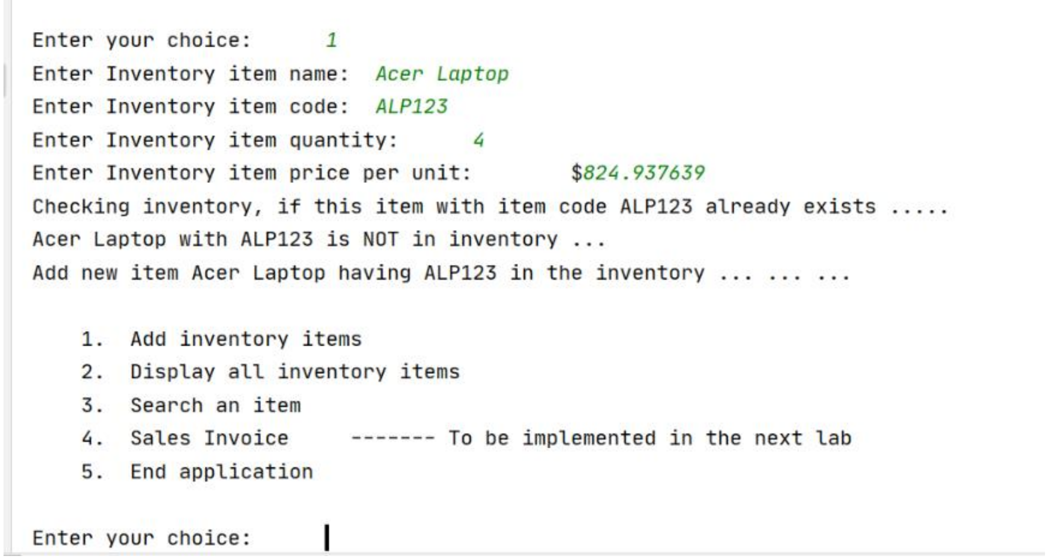
Note that for the very first item to be added, message is:

Inventory does not have items ….

Adding new item in the inventory …..

First item information saved …..

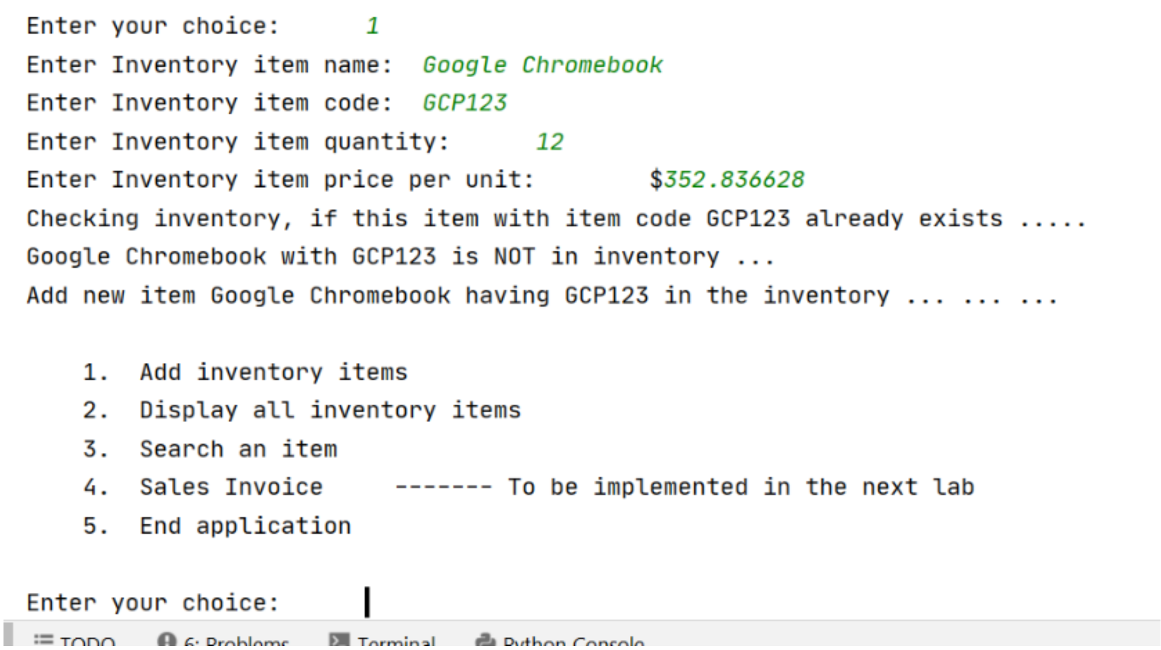
Add another item in the inventory (using option 1)



```
Enter your choice:      1
Enter Inventory item name:  Acer Laptop
Enter Inventory item code:  ALP123
Enter Inventory item quantity:      4
Enter Inventory item price per unit:        $824.937639
Checking inventory, if this item with item code ALP123 already exists .....
Acer Laptop with ALP123 is NOT in inventory ...
Add new item Acer Laptop having ALP123 in the inventory ... ... ...

    1.  Add inventory items
    2.  Display all inventory items
    3.  Search an item
    4.  Sales Invoice     ------- To be implemented in the next lab
    5.  End application

Enter your choice:      
```

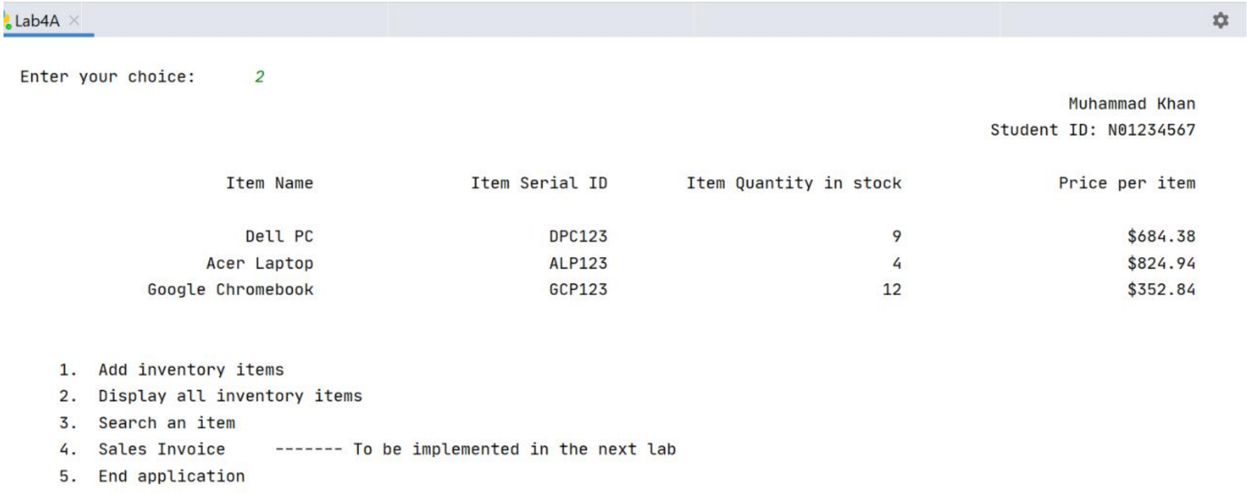
Note the message – Item is added after checking if item ID already exists or not.

Add another item:



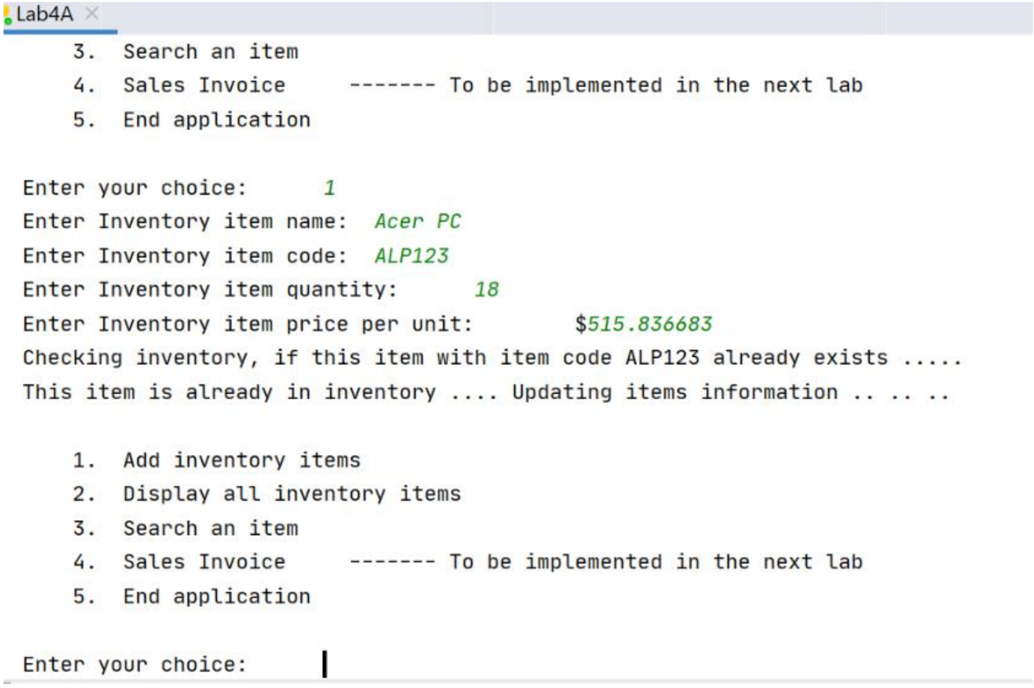
```
Enter your choice:      1
Enter Inventory item name:  Google Chromebook
Enter Inventory item code:  GCP123
Enter Inventory item quantity:      12
Enter Inventory item price per unit:        $352.836628
Checking inventory, if this item with item code GCP123 already exists .....
Google Chromebook with GCP123 is NOT in inventory ...
Add new item Google Chromebook having GCP123 in the inventory ... ... ...

    1.  Add inventory items
    2.  Display all inventory items
    3.  Search an item
    4.  Sales Invoice     ------- To be implemented in the next lab
    5.  End application

Enter your choice:
```

Option/Choice 2 displays all the items in inventory:



```
Enter your choice:      2
                                                                                          Muhammad Khan
                                                                                  Student ID: N01234567

                    Item Name              Item Serial ID       Item Quantity in stock           Price per item

                      Dell PC                      DPC123                            9                  $684.38
                  Acer Laptop                      ALP123                            4                  $824.94
            Google Chromebook                      GCP123                           12                  $352.84


    1.  Add inventory items
    2.  Display all inventory items
    3.  Search an item
    4.  Sales Invoice     ------- To be implemented in the next lab
    5.  End application
```

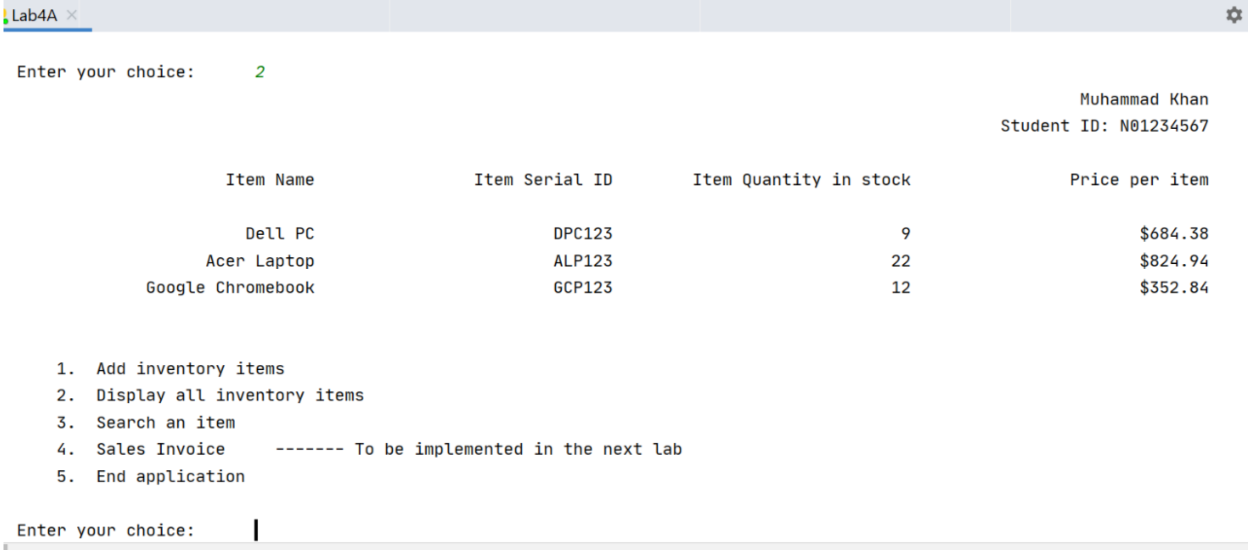
Add another item – that already exists (ALP123 already exists):



```
     3.   Search an item
     4.   Sales Invoice     ------- To be implemented in the next lab
     5.   End application

 Enter your choice:      1
 Enter Inventory item name:   Acer PC
 Enter Inventory item code:   ALP123
 Enter Inventory item quantity:       18
 Enter Inventory item price per unit:        $515.836683
 Checking inventory, if this item with item code ALP123 already exists .....
 This item is already in inventory .... Updating items information .. .. ..

     1.   Add inventory items
     2.   Display all inventory items
     3.   Search an item
     4.   Sales Invoice     ------- To be implemented in the next lab
     5.   End application

 Enter your choice:
```

Check the count (quantity) of items, as well as price of individual item.

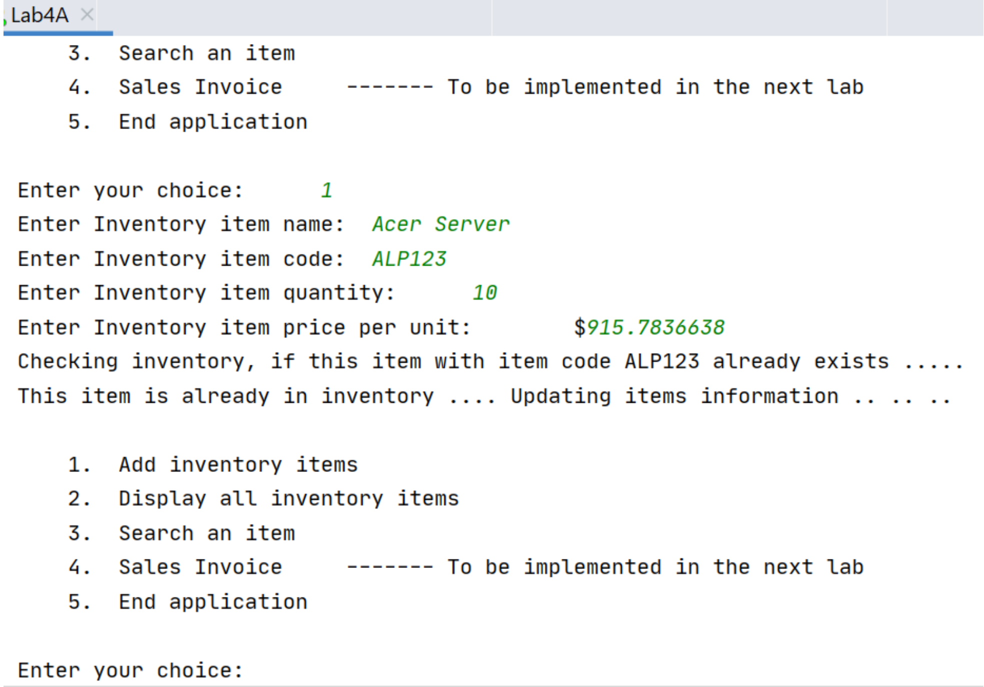
Item unit price will not change as new item price is lower than the item price that is saved in the system.



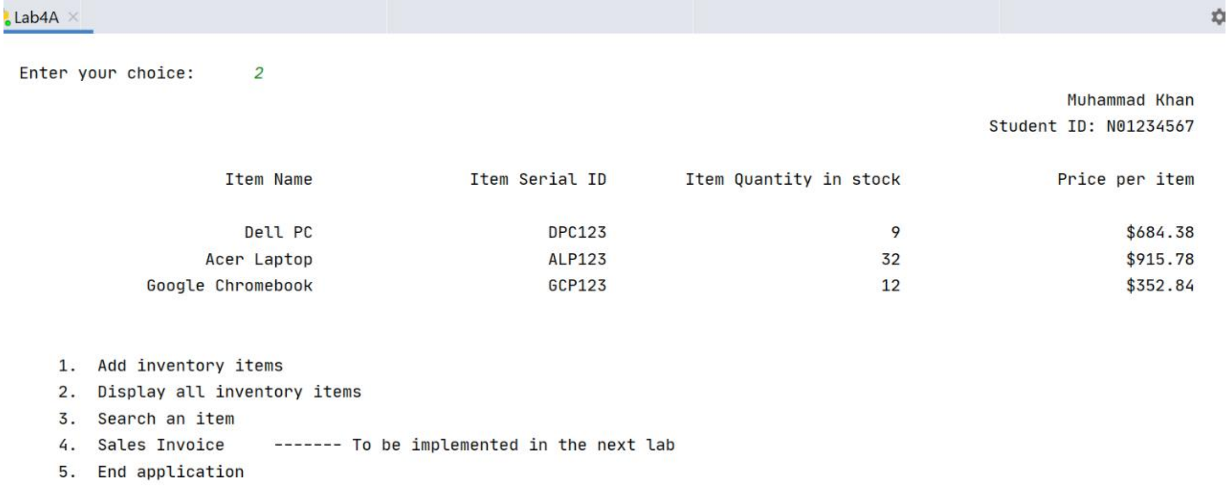
```
 Enter your choice:      2
                                                                                      Muhammad Khan
                                                                               Student ID: N01234567

                     Item Name             Item Serial ID      Item Quantity in stock            Price per item

                       Dell PC                     DPC123                           9                   $684.38
                  Acer Laptop                      ALP123                          22                   $824.94
             Google Chromebook                     GCP123                          12                   $352.84


     1.   Add inventory items
     2.   Display all inventory items
     3.   Search an item
     4.   Sales Invoice     ------- To be implemented in the next lab
     5.   End application

 Enter your choice:
```

Updated quantity is 22 (this is 4 + 18). Price did not change, as new price value was lower than the price of inventory items.

Now adding another item to the inventory, ALP123. Now quantity is also updated as well as price is also increased.



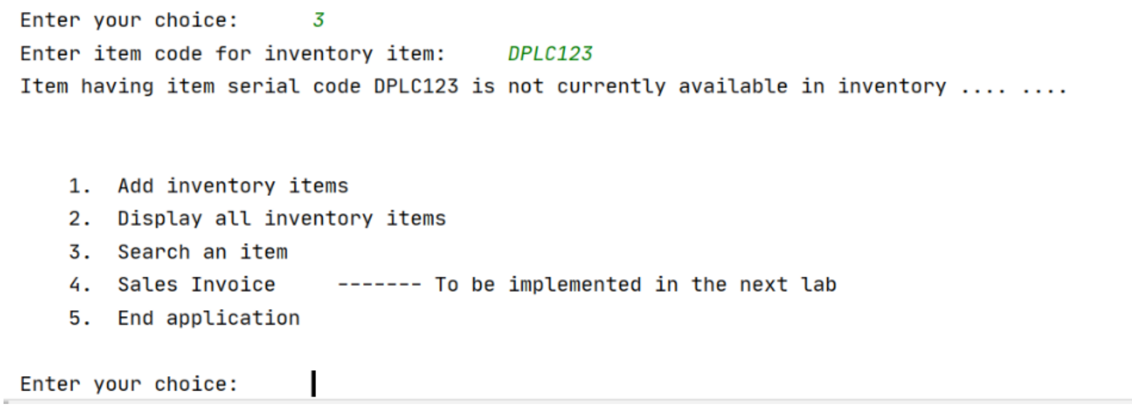
```
    3.  Search an item
    4.  Sales Invoice     ------- To be implemented in the next lab
    5.  End application

Enter your choice:      1
Enter Inventory item name:  Acer Server
Enter Inventory item code:  ALP123
Enter Inventory item quantity:      10
Enter Inventory item price per unit:        $915.7836638
Checking inventory, if this item with item code ALP123 already exists .....
This item is already in inventory .... Updating items information .. .. ..

    1.  Add inventory items
    2.  Display all inventory items
    3.  Search an item
    4.  Sales Invoice     ------- To be implemented in the next lab
    5.  End application

Enter your choice:
```



```
Enter your choice:      2
                                                                                 Muhammad Khan
                                                                            Student ID: N01234567

                Item Name              Item Serial ID     Item Quantity in stock          Price per item

                  Dell PC                     DPC123                            9                $684.38
              Acer Laptop                     ALP123                           32                $915.78
        Google Chromebook                     GCP123                           12                $352.84


    1.  Add inventory items
    2.  Display all inventory items
    3.  Search an item
    4.  Sales Invoice     ------- To be implemented in the next lab
    5.  End application
```

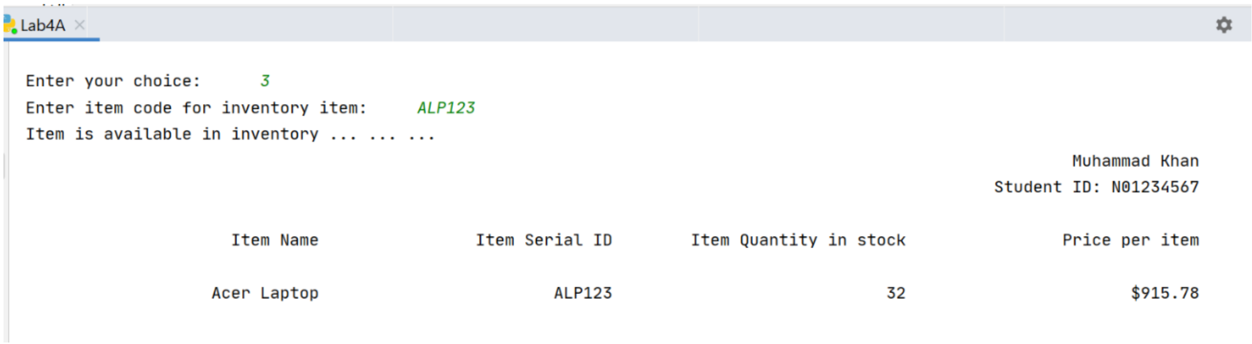
Observe the updated quantity as well as the updated price (price increased compared to the previous value)

Choosing option 3 to search an item, and item does not exist:



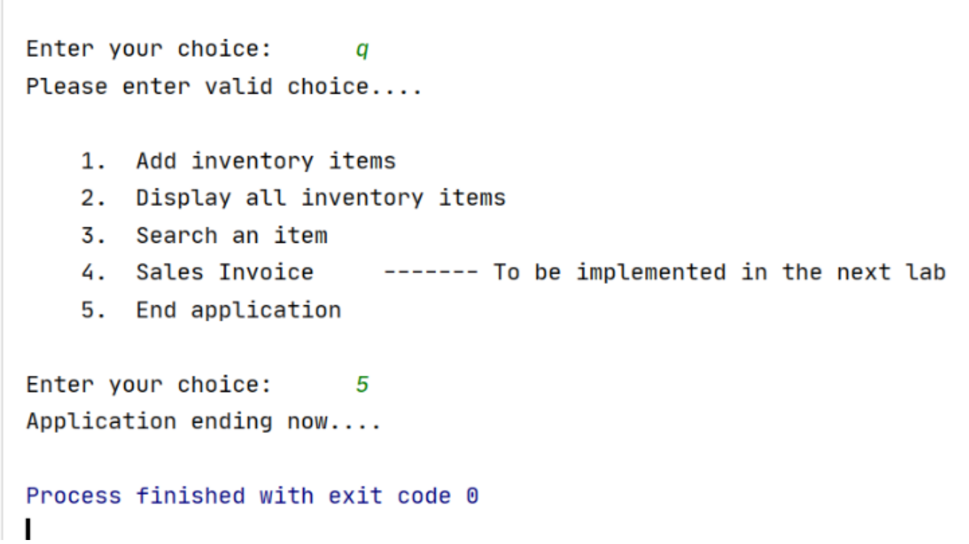
```
Enter your choice:      3
Enter item code for inventory item:     DPLC123
Item having item serial code DPLC123 is not currently available in inventory .... ....


    1.  Add inventory items
    2.  Display all inventory items
    3.  Search an item
    4.  Sales Invoice     ------- To be implemented in the next lab
    5.  End application

Enter your choice:
```

Now choose option 3, when item already exists.



```
Enter your choice:      3
Enter item code for inventory item:     ALP123
Item is available in inventory ... ... ...
                                                                                      Muhammad Khan
                                                                             Student ID: N01234567

                    Item Name                Item Serial ID        Item Quantity in stock                   Price per item


                  Acer Laptop                       ALP123                            32                          $915.78
```

Option 5 ends the application:



```
Enter your choice:      q
Please enter valid choice....

    1.  Add inventory items
    2.  Display all inventory items
    3.  Search an item
    4.  Sales Invoice     ------- To be implemented in the next lab
    5.  End application

Enter your choice:      5
Application ending now....

Process finished with exit code 0
```

Reports submission:

Lab report to be submitted:

a) Complete source code (filename) having filename extension ".py"
b) Inventory is stored in dictionary and dictionary structure is saved in data file
c) Execute application and take screenshots of all valid and invalid test cases to test the boundary conditions (as shown in the problem definition above). Crop the screenshots and paste them in a document. Upload PDF format of the document.

The conditions to be tested:

a) Enter choice 2 to display inventory, without adding items in the inventory
b) Enter choice 3 to search and display inventory items, without adding any item in the inventory
c) Choose option other than the valid choices (1, 2, 3, or 5). It could be alphabet or numeric value
d) Add two to three items in inventory and display using option 2.
e) Add an item having identical Serial Code to an existing item in the inventory to show that quantity is updated without updating the item price
f) Add an item having identical Serial Code to existing item in inventory, but having higher item unit price to show the update in inventory quantity as well as inventory price (unit price)
g) Search inventory when Item is in the inventory
h) Search inventory when Item is NOT in the inventory.
i) Enter valid choice as option as well as invalid choice as an option (to show the messages displayed
j) Demonstrate how application ends.

These screenshots (with various options shown above) are pasted and cropped in the document and PDF is uploaded.

Rubric for Lab 3:

Menu options (with proper conditions and loops – executed in main)	**2 Marks**
Different test conditions to add an item in the inventory (file)	**4 Marks**
Different test conditions to search an item from inventory (file)	**3 Marks**
Application end and other invalid conditions	**1 Mark**

Total: **10 Marks**