CS4059NI Fundamentals of Computing

60% Individual Coursework

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Word Count: 242

I confirm that I understand my coursework needs to be submitted online via MySecondTeacher under the relevant module page before the deadline in order for my assignment to be accepted and marked. I am fully aware that late submissions will be treated as non-submission and a marks of zero will be awarded.

Contents

1. Introduction

The first COURSEWORK from the Fundamentals of Computing course is examined in this report. Sixty percent of the final grade for the module comes from a single assignment.

Laptops are becoming a necessary component of our life in the digital age since they are effective instruments for work, pleasure, and communication. By locating high-quality computers and making them accessible to people and businesses, laptop shops play a critical role in bridging the gap between producers and consumers. The construction of a program for a laptop shop that purchases computers from manufacturers and sells them to a variety of consumers, including both individuals and businesses, is the main goal of this project. To manage data about the laptops that are available and conduct tasks like ordering from suppliers and selling to consumers, the application will use a text file.

Python programing language is used to do this project as python is a high-level, interpreted and general purpose programming language. Programming paradigms such as procedural, object-oriented, and functional programming are all supported by Python. It offers a wide range of functions for jobs like file processing, networking, web development, and more thanks to its extensive and thorough standard library. So it is used to accomplish this project.

1.1. Goals and Objective

The Goals and Objective of the project is aims to provide a comprehensive system for controlling laptop retail transactions. The program will make it easier to buy and sell laptops by managing two different types of transactions: buying laptops from producers and selling laptops to customers. The software will provide capabilities to read a text file holding information about laptops, including information about the laptop's name, brand, price, number, processor characteristics, and graphics card. By displaying the user the computers that are now accessible, this information will be used to provide them a general idea of the shop's inventory.

For each transaction, the application will produce note/invoice files (in.txt format). When a laptop is sold, an invoice is created that includes pertinent information including the name of the laptop, its brand, the customer's name, the date and time of the purchase, the total money paid (including shipping costs) and the total amount due. The main text file's stock of the sold laptop will be updated, lowering the amount still available.

Similarly, when laptops are ordered from manufacturers, the program will generate an order invoice with details including the distributor's name (company), laptop's name, brand, date and time of purchase, net amount (total amount without VAT), VAT amount (13% of the total amount), and the gross amount (total amount with VAT). The stock of the ordered laptop will be updated in the main text file, increasing the available quantity accordingly.

2. Algorithm

2.1. Main.py algorithm

step 1. Import the 'buy' and 'sell' modules.

step 2.Display the store name and address.

step 3.Initialize a while loop with 'System_loop' as True.

step 4.Display the options to the user: purchase laptop, sell laptop, or exit.

step 5.Take user input and check which option the user chose.

step 6.If the user chose '1', call the 'buy_laptop()' function from the 'buy' module.

step 7.If the user chose '2', call the 'sell_laptop()' function from the 'sell' module.

step 8.If the user chose '3', print a goodbye message and break the loop.

step 9.If the user entered an invalid option, display a message to enter a valid option.

step 10.Ask the user if they want to buy or sell anything again.

step 11. If the user enters 'N' or 'n', set the 'System_loop' variable to False to end the loop.

step 12.If there is an error in user input, display a message to enter a valid input from 1 to 3.

step 13.End of the algorithm.

2.2. Buy.py algorithm

Step1. Open the "laptop.txt" file in read mode and create an empty dictionary "mydict" and a variable "lap_id" and set its value to 1.

For each line in the file, remove the newline character and split the line using a comma. Store the resulting list in the "mydict" dictionary with the "lap_id" key. Increment "lap_id" by 1 for each line.

Step 2. Define a function named "buy_laptop".

Step 3. Display a message asking the user to enter their name and phone number.

Step 4. Check if the phone number is valid (10 digits) and prompt the user to enter again if it's invalid.

Step 5. Display the laptop details from the "laptop.txt" file in a tabular format.

Step 6. Prompt the user to enter the ID of the laptop they want to buy.

Step 7. Validate the laptop ID entered by the user and prompt the user to enter again if it's invalid.

Step 8. Prompt the user to enter the quantity of the laptop they want to buy.

Step 9. Check if the quantity entered by the user is valid (not less than 1 and not more than the available quantity) and prompt the user to enter again if it's invalid.

Step 10. Update the available quantity of the laptop in the "mydict" dictionary and save it to the "laptop.txt" file.

Step 11. Calculate the price of the laptop based on the quantity and add a shipping cost if the user wants the laptop to be shipped.

Step 12. Create a list "dir" containing the product name, quantity, unit price, net amount, and total.

Step 13. Open the "buy.txt" file in write mode and write the bill details.

Step 14. Display the bill to the user.

Step 15. Close the "buy.txt" file and exit the program.

2.3. Sell .py algorithm

Step 1.Open the "laptop.txt" file in read mode.

Step 2.Create an empty dictionary to store laptop information.

Step 3.Initialize a laptop ID variable to 1.

Step 4.Loop through each line in the "laptop.txt" file and store the laptop information in the dictionary using the laptop ID as the key.

Step 5.Increment the laptop ID variable by 1 for each line.

Step 6.Define a function named "sell_laptop".

Step 7.Within the "sell_laptop" function, prompt the user to enter their name and phone number for the bill.

Step 8.Validate the phone number input by checking if it is exactly 10 digits long. If it is not, ask the user to enter the phone number again.

Step 9.Print the list of laptops available for sale.

Step 10. Prompt the user to enter the ID of the laptop they want to buy.

Step 11.Validate the laptop ID input by checking if it is a valid ID number.

Step 12.Prompt the user to enter the quantity of laptops they want to buy.

Step 13.Validate the quantity input by checking if it is greater than zero and less than or equal to the quantity of laptops available for sale.

Step 14.Update the quantity of laptops available for sale in the dictionary.

Step 15.Write the updated laptop information to the "laptop.txt" file.

Step 16.Calculate the total cost of the purchase.

Step 17.Ask the user if they want the laptop to be shipped and add the shipping cost to the total cost if necessary.

Step 18.Write the bill information to a new file named "sell.txt".

Step 19.Print the bill information to the console.

Step 20.End the program.

3. FlowChart

Main.py flow chart

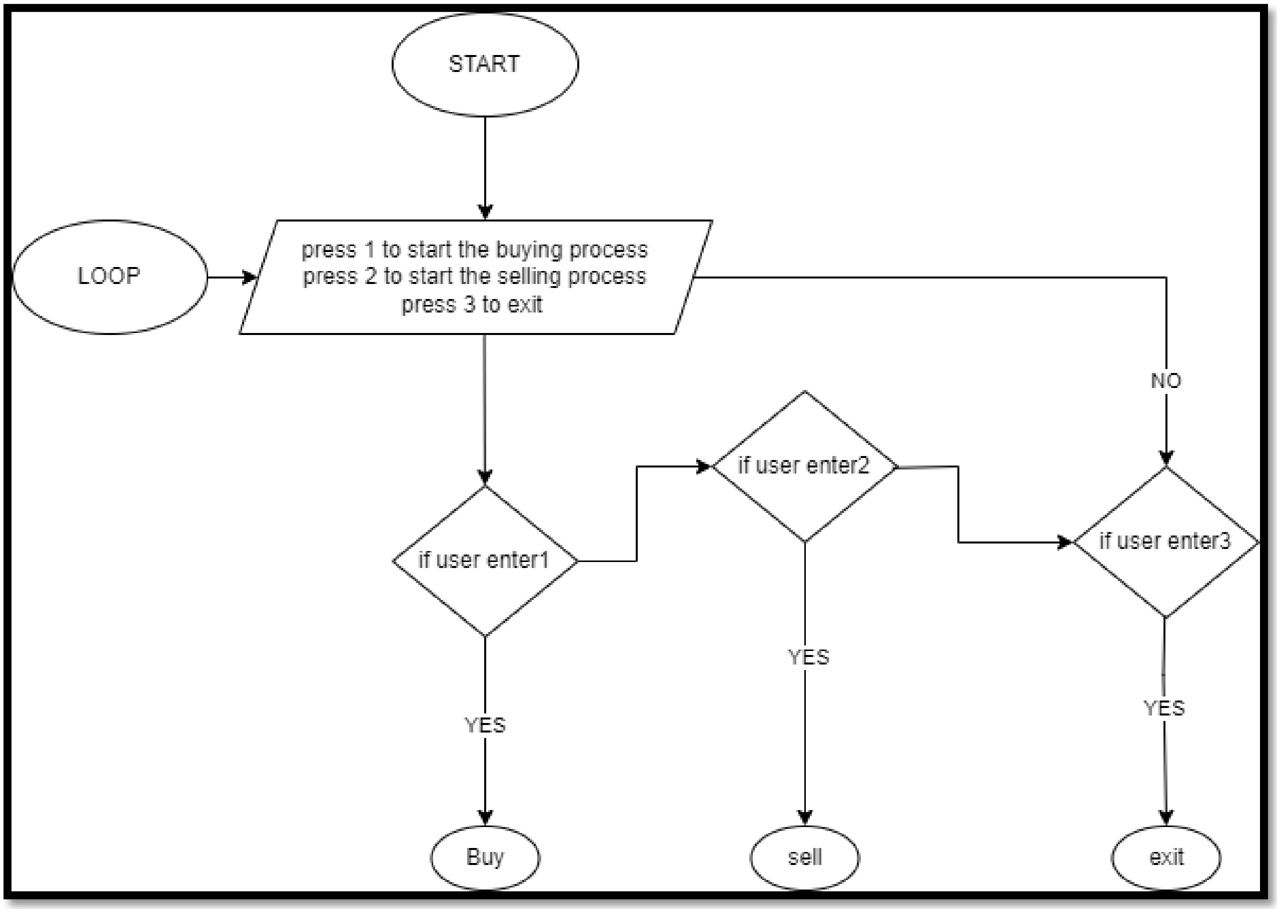


Figure 1 Main.py Flow chart

4. Pseudo code

4.1. Main.py file

```
IMPORT buy
IMPORT sell

DISPLAY "Prashant electronics"
DISPLAY "Thulobhyaryang, Kathmandu"

System_loop = True

WHILE System_loop is True:

    TRY:
        DISPLAY "Press 1 to Purchase Laptop"
        DISPLAY "Press 2 to Sell laptop"
        DISPLAY "Press 3 to exit"

        SET user_input = GET user input as integer

        IF user_input is equal to 1:
            CALL function buy_laptop() from module buy

        ELSE IF user_input is equal to 2:
            CALL function sell_laptop() from module sell
        ELSE IF user_input is equal to 3:
            DISPLAY "Thank you, We hope we could see you again"
            BREAK

        ELSE:
            DISPLAY "Enter a valid option"

        SET choice = GET user input as string

        IF choice is equal to 'N' or 'n':
            SET System_loop = False

    EXCEPT:
        DISPLAY "Error - Enter a valid input from 1 to 3"

END WHILE
```

4.2. Buy.py file

```
OPEN
          "laptop.txt" file in read mode
CREATE
           an empty dictionary "mydict" to store the laptop details
SET
         the "lap_id" variable to 1
FOR  each line in the file do the following:
Remove the newline character from the line
SPLIT
         the line by comma and store the result in the "mydict" dictionary with the "lap_id" as the key
INCREMENT  the "lap_id" by 1
CLOSE  the file
DEFINE
         a function called "buy_laptop"
WHILE
          the user to enter their name and phone number for the bill
WHILE the phone number input to be exactly 10 digits long
DISPLAY
            the laptop details with their corresponding IDs
WHILE
      the user to enter the laptop ID they want to buy
Validate the laptop ID input to be within the range of available IDs
```

```
WHILE the user to enter the quantity of laptops they want to buy
Validate the quantity input to be within the available quantity of the selected laptop
Update the available quantity of the selected laptop in the "mydict" dictionary
OPEN  the "laptop.txt" file in write mode
Write the updated details in the file
CLOSE the file
Calculate the total amount for the purchase with 13% tax
DISPLAY the user to choose whether they want the laptop to be shipped or not
IF the user wants the laptop to be shipped, add $100 to the total amount
CREATE
        a list "dir" with the product name, quantity, unit price, net amount, and total amount
OPEN  WITH the "buy.txt" file in write mode
        Write the bill details in the file using the "dir" list and the customer name and phone number
CLOSE  the file
OPEN  the "buy.txt" file in read mode
Read the contents of the file and print them to the console
CLOSE the file.
```

4.3. Sell .py file

```
OPEN
  the 'laptop.txt' file in
CREATE
          an empty dictionary 'mydict' to store laptop details.
CREATE
         a variable 'lap_id' and set it to 1.
LOOP
         through each line in the 'laptop.txt' file:
REMOVE
            the newline character at the end of each line.
Split each line by comma and store the resulting list as a value in the
'mydict' dictionary with the 'lap_id' as key.
INCREMENT
         the 'lap_id' variable.
DEFINE
     a function named 'sell_laptop()':
PRINT
        a message asking for customer details.
PRINT
         a separator line.
PRINT
        Ask the user for the customer's name and phone number, and
validate the phone number to be 10 digits long.
PRINT
```

a separator line.

OPEN the 'laptop.txt' file

PRINT

a table of all available laptops, with the laptop ID, name, brand, price, quantity, CPU, and graphics information.

CLOSE

the 'laptop.txt' file.

PRINT

Ask the user to enter the ID of the laptop they want to buy, and validate the ID to be within the range of the 'mydict' dictionary keys.

PRINT

Ask the user for the quantity of laptops they want to buy, and validate the quantity to be within the range of the available quantity for that laptop.

UPDATE

the 'mydict' dictionary with the new quantity of the selected laptop.

OPEN

the 'laptop.txt' file in write mode.

LOOP

through each value in the 'mydict' dictionary and write the updated laptop details to the 'laptop.txt' file, separated by commas and with each laptop detail on a new line.

CLOSE

the 'laptop.txt' file.

Calculate the total cost of the purchase, including tax and shipping (if applicable), and store the details in a list named 'dir'.

OPEN

the 'buy.txt' file in write mode and write the bill details, including the customer's name, phone number, and the details of the purchased laptop(s).

PRINT

The contents of the 'buy.txt' file.

CLOSE

the 'buy.txt' file

5. Data Structures

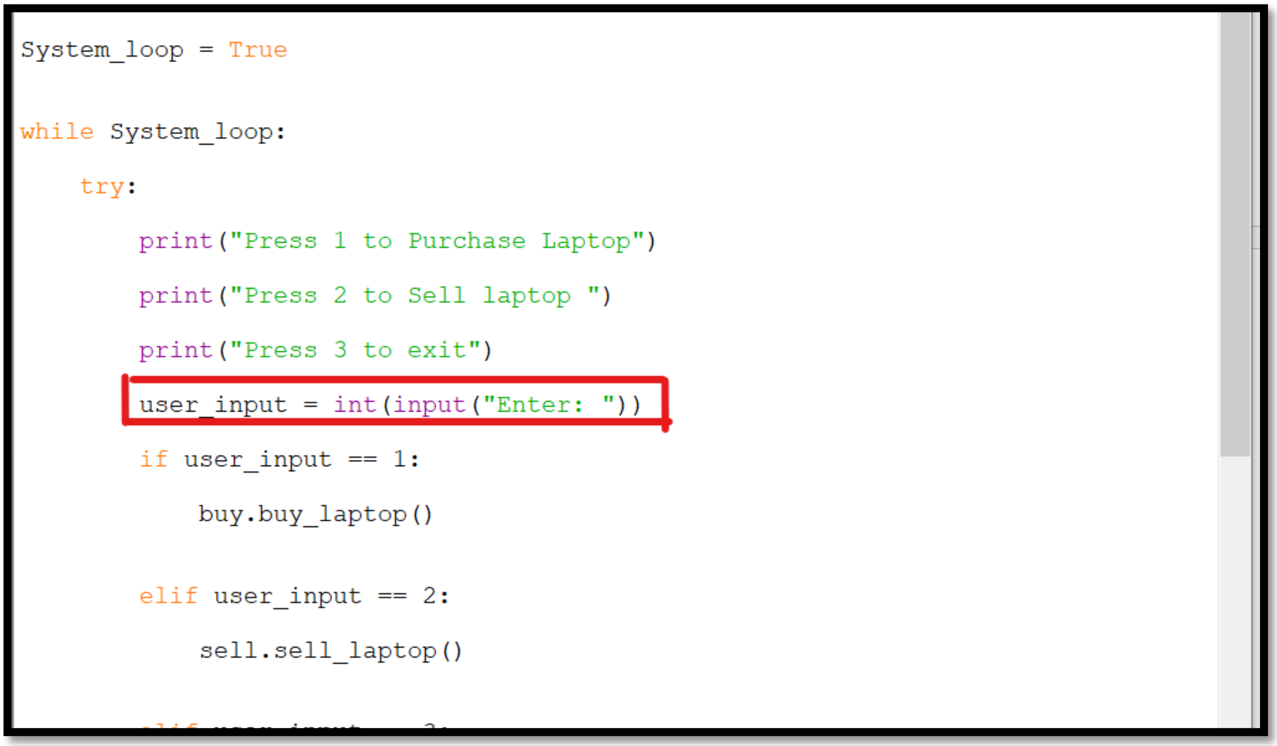
Data structures are containers that organize and classify data into types of categories. Data structures come in a variety of sequences and mutability levels. Some of the core data structures used in Python include lists, sets, tuples, and dictionaries.

In the development of this software and the storing of its data, various data types were used. The data types and building blocks this software employs are as follows:

i. Integer
ii. String
iii. List
iv. Dictionary

i. Integer

Integers are the kind of values that the int class refers to. It may contain only full numbers (i.e., no fraction or decimal), both positive and negative. An integer's length is limitless; it can last however long is desired. In this project, integers are used in the software development code. For instance, by using the integer (int) input type in the image below, the user can select an option and the number to process in order to rent, return, or quit.

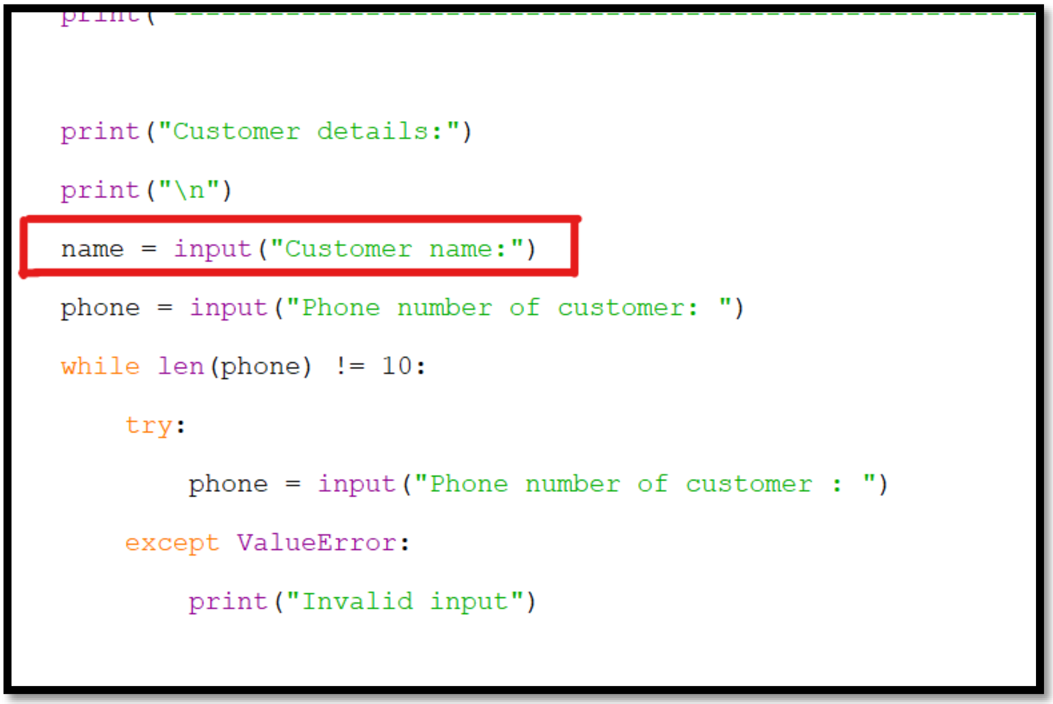


```
System_loop = True

while System_loop:
    try:
        print("Press 1 to Purchase Laptop")
        print("Press 2 to Sell laptop ")
        print("Press 3 to exit")
        user_input = int(input("Enter: "))
        if user_input == 1:
            buy.buy_laptop()

        elif user_input == 2:
            sell.sell_laptop()

        elif user_input == 3:
```

Figure 2 Example of int data type in code

ii. String

A string is a grouping of one or more characters that is contained in a single, double, or triple quotation. Since Python lacks a character datatype, a single word can also be a string. It is represented by the class str. There are a lot. Instances where strings are used as inputs in this program, mostly



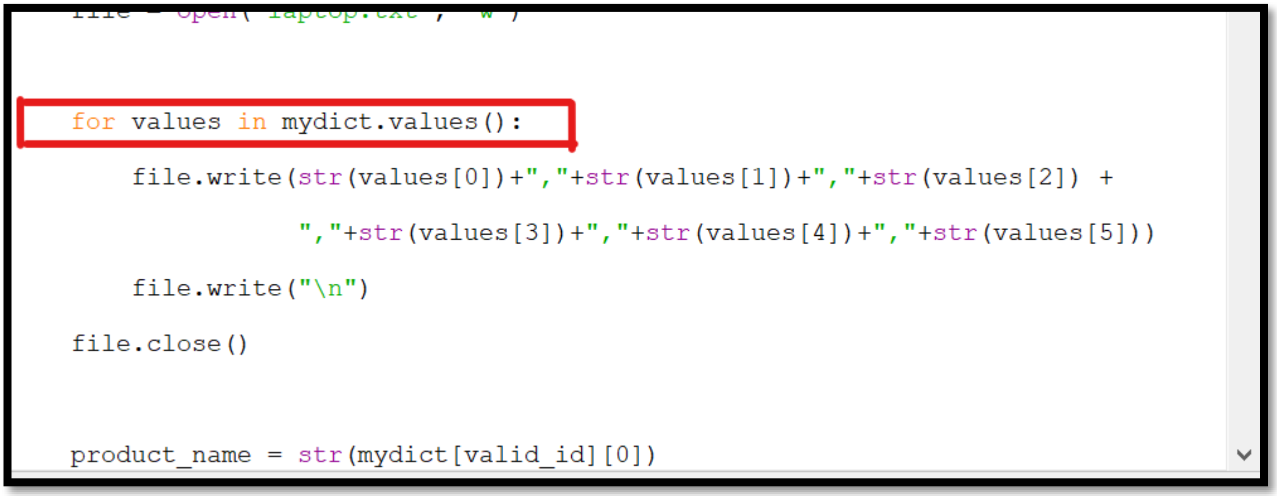
```
print("-----------------------------------------------------


print("Customer details:")

print("\n")

name = input("Customer name:")

phone = input("Phone number of customer: ")

while len(phone) != 10:

    try:

        phone = input("Phone number of customer : ")

    except ValueError:

        print("Invalid input")
```

Figure 3 : Example of String data type in code

iii. List

A list is a structured collection of items. A list is referred to as a "ordered collection" since each item is displayed in a specified order that makes identification possible. The list is also mutable, enabling the insertion, deletion,

updating list entries, etc. Because everything in Python is an object, constructing a list is essentially the same as creating a Python object of a certain datatype. Nesting is supported in the list. This means that we can store any other list—often referred to as a 2D list—within a list.

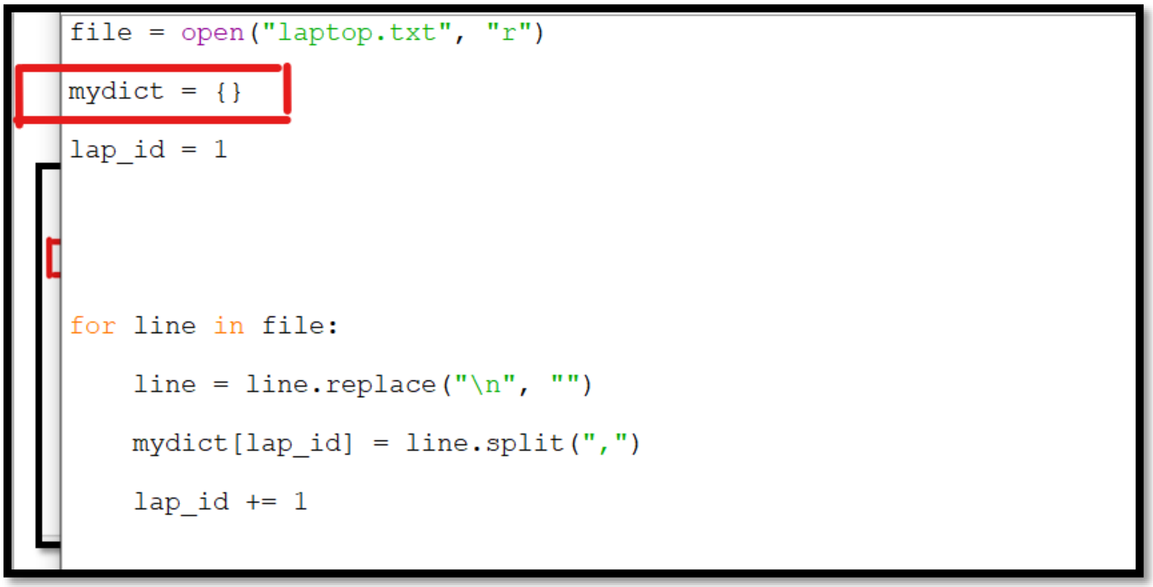


```
file = open("laptop.txt", "w")


for values in mydict.values():
    file.write(str(values[0])+","+str(values[1])+","+str(values[2]) +
               ","+str(values[3])+","+str(values[4])+","+str(values[5]))
    file.write("\n")
file.close()


product_name = str(mydict[valid_id][0])
```

Figure 4 Example of List data type in code

iv. Dictionary

Dictionary is an unordered collection of data values that is similar to a map, as opposed to other data types that only contain a single value as an element. Because dictionaries are mutable, we can change the key value in the dictionaries that use keywords.



```
file = open("laptop.txt", "r")
mydict = {}
lap_id = 1



for line in file:
    line = line.replace("\n", "")
    mydict[lap_id] = line.split(",")
    lap_id += 1
```

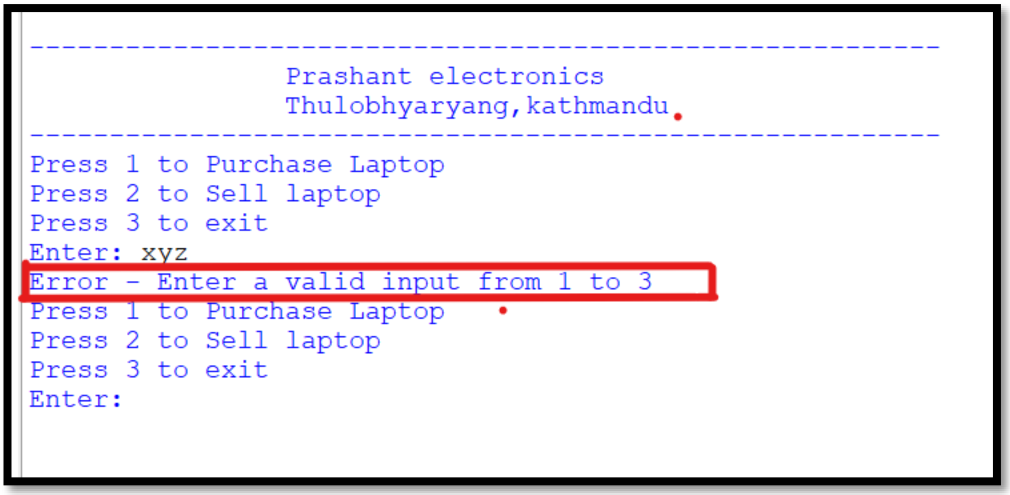
Figure 5 Example of Dictionary created

6. Program

This project's curriculum is made up of a range of modules and tasks. The majority of the software's module files are connected to one another both directly and indirectly. Each module performs a certain task using a variety of a variety of goals in mind, including reading and writing files, examining conditions, constructing arrays, receiving inputs, making notes, updating arrays, executing loops, and displaying outputs.

- **How does the program run?**

  When the application is launched using the main method, an interface with a number of options for performing various activities appears. There are options for showcasing available Laptops, Laptop Brands, Price, CPU, and making a bill of services supplied transaction in addition to the decision to exit the business. Additionally, if an alphabetic value rather than an integer is specified for the option, this procedure throws an error.

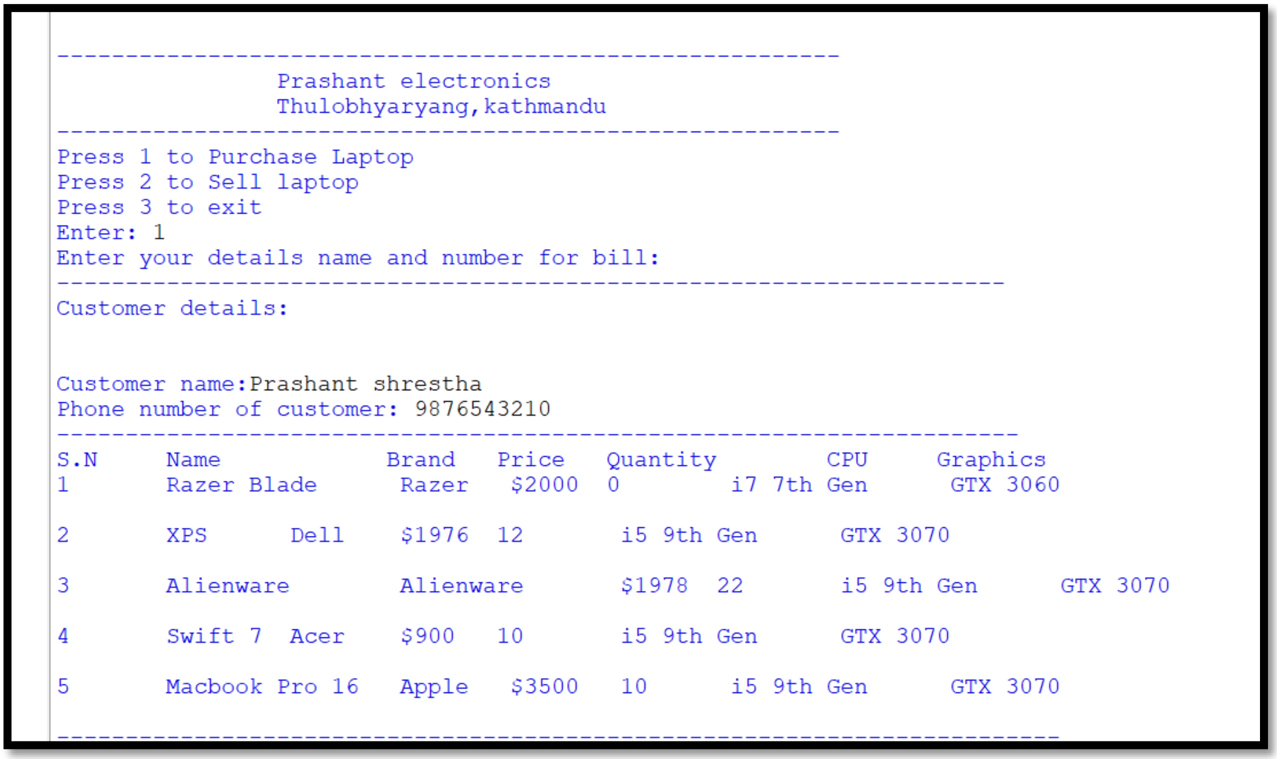


```
-----------------------------------------------------------
                Prashant electronics
                Thulobhyaryang,kathmandu.
-----------------------------------------------------------
Press 1 to Purchase Laptop
Press 2 to Sell laptop
Press 3 to exit
Enter: xyz
Error - Enter a valid input from 1 to 3
Press 1 to Purchase Laptop
Press 2 to Sell laptop
Press 3 to exit
Enter:
```

Figure 6 Providing invalid input

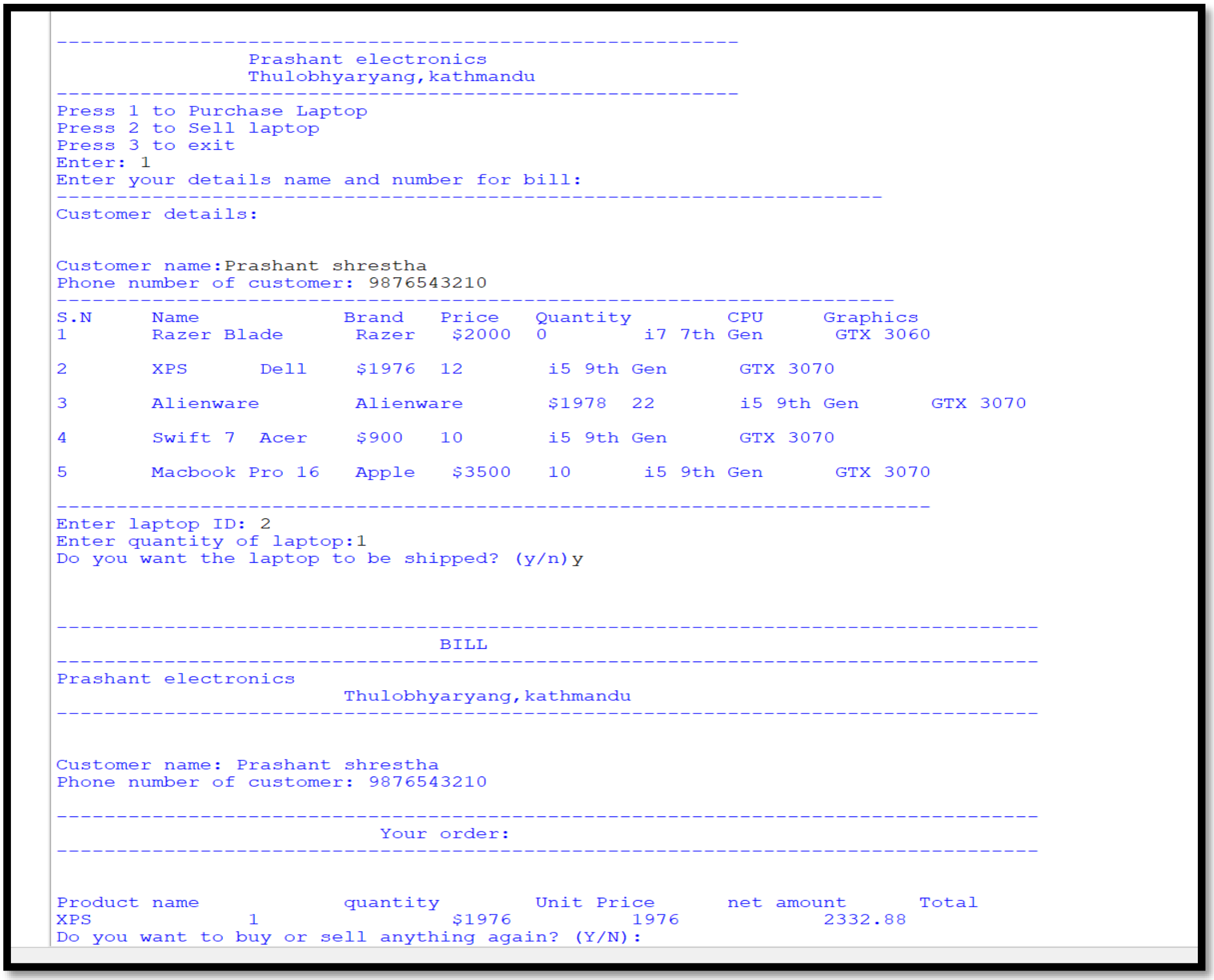
- **When we enter 1 as an input.**

When we enter 1 as the choice, we get a detailed description of the Laptops along with brand, price, custom and quantity.



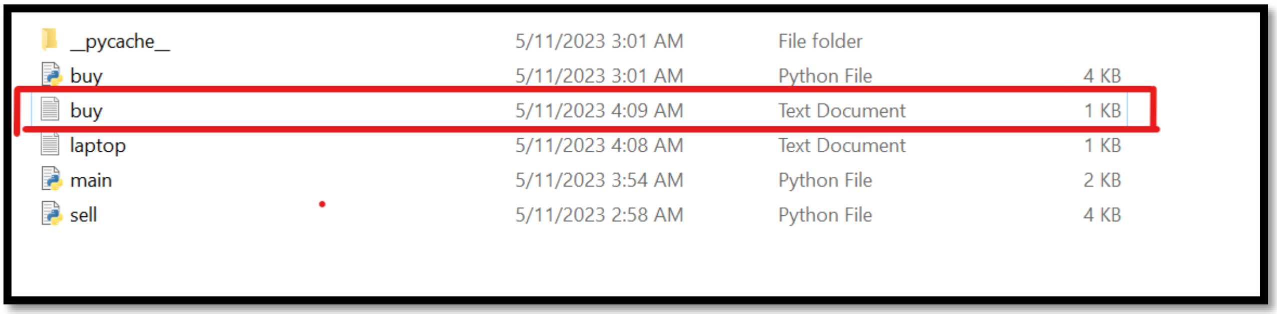
```
---------------------------------------------------------
                Prashant electronics
                Thulobhyaryang,kathmandu
---------------------------------------------------------
Press 1 to Purchase Laptop
Press 2 to Sell laptop
Press 3 to exit
Enter: 1
Enter your details name and number for bill:
---------------------------------------------------------------------
Customer details:


Customer name:Prashant shrestha
Phone number of customer: 9876543210
----------------------------------------------------------------------
S.N     Name            Brand   Price   Quantity        CPU     Graphics
1       Razer Blade      Razer   $2000  0        i7 7th Gen      GTX 3060

2       XPS      Dell    $1976  12       i5 9th Gen      GTX 3070

3       Alienware        Alienware       $1978  22       i5 9th Gen      GTX 3070

4       Swift 7  Acer    $900   10       i5 9th Gen      GTX 3070

5       Macbook Pro 16   Apple   $3500   10      i5 9th Gen      GTX 3070

-------------------------------------------------------------------------
```

Figure 7 When 1 is entered



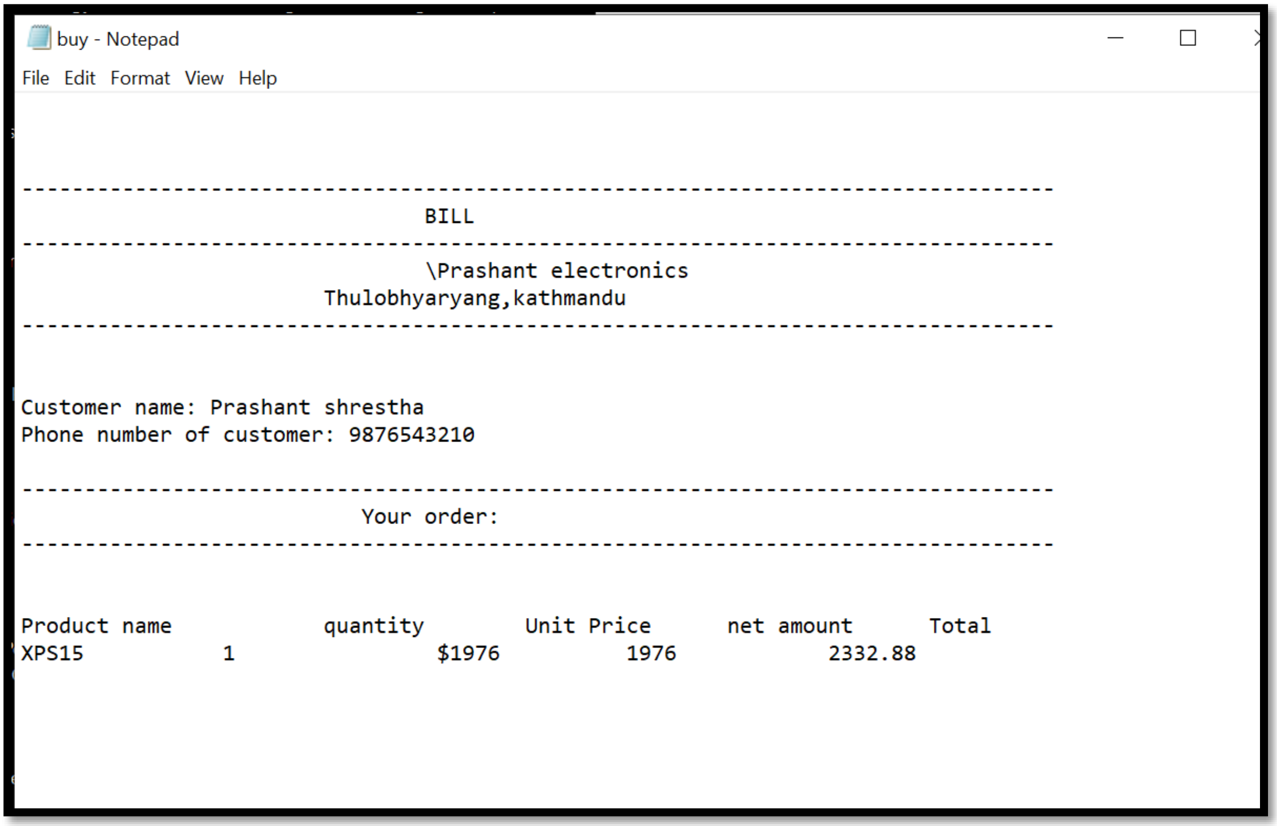
```
---------------------------------------------------------
                Prashant electronics
                Thulobhyaryang,kathmandu
---------------------------------------------------------
Press 1 to Purchase Laptop
Press 2 to Sell laptop
Press 3 to exit
Enter: 1
Enter your details name and number for bill:
---------------------------------------------------------------------
Customer details:


Customer name:Prashant shrestha
Phone number of customer: 9876543210
----------------------------------------------------------------------
S.N     Name            Brand   Price   Quantity        CPU     Graphics
1       Razer Blade      Razer   $2000  0        i7 7th Gen      GTX 3060

2       XPS      Dell    $1976  12       i5 9th Gen      GTX 3070

3       Alienware        Alienware       $1978  22       i5 9th Gen      GTX 3070

4       Swift 7  Acer    $900   10       i5 9th Gen      GTX 3070

5       Macbook Pro 16   Apple   $3500  10       i5 9th Gen      GTX 3070

-------------------------------------------------------------------------
Enter laptop ID: 2
Enter quantity of laptop:1
Do you want the laptop to be shipped? (y/n)y


----------------------------------------------------------------------------------
                                BILL
----------------------------------------------------------------------------------
Prashant electronics
                        Thulobhyaryang,kathmandu
----------------------------------------------------------------------------------


Customer name: Prashant shrestha
Phone number of customer: 9876543210

----------------------------------------------------------------------------------
                           Your order:
----------------------------------------------------------------------------------


Product name            quantity        Unit Price      net amount      Total
XPS             1                $1976          1976            2332.88
Do you want to buy or sell anything again? (Y/N):
```

Figure 8 Complete Buying process



__pycache__	5/11/2023 3:01 AM	File folder	
buy	5/11/2023 3:01 AM	Python File	4 KB
buy	5/11/2023 4:09 AM	Text Document	1 KB
laptop	5/11/2023 4:08 AM	Text Document	1 KB
main	5/11/2023 3:54 AM	Python File	2 KB
sell	5/11/2023 2:58 AM	Python File	4 KB

Figure 9 text file generated of buying

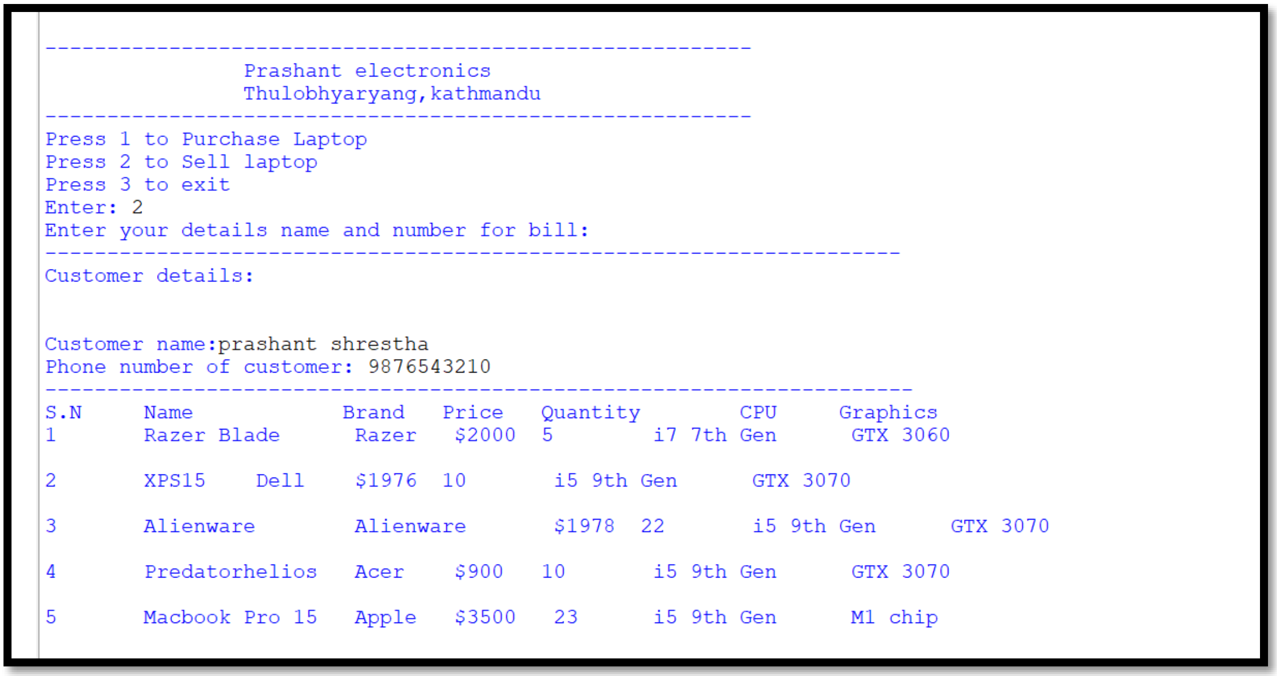


```


----------------------------------------------------------------------------------
                                BILL
----------------------------------------------------------------------------------
                                \Prashant electronics
                        Thulobhyaryang,kathmandu
----------------------------------------------------------------------------------


Customer name: Prashant shrestha
Phone number of customer: 9876543210

----------------------------------------------------------------------------------
                           Your order:
----------------------------------------------------------------------------------


Product name            quantity        Unit Price      net amount      Total
XPS15           1                $1976          1976            2332.88
```

Figure 10 Bill generated for buying

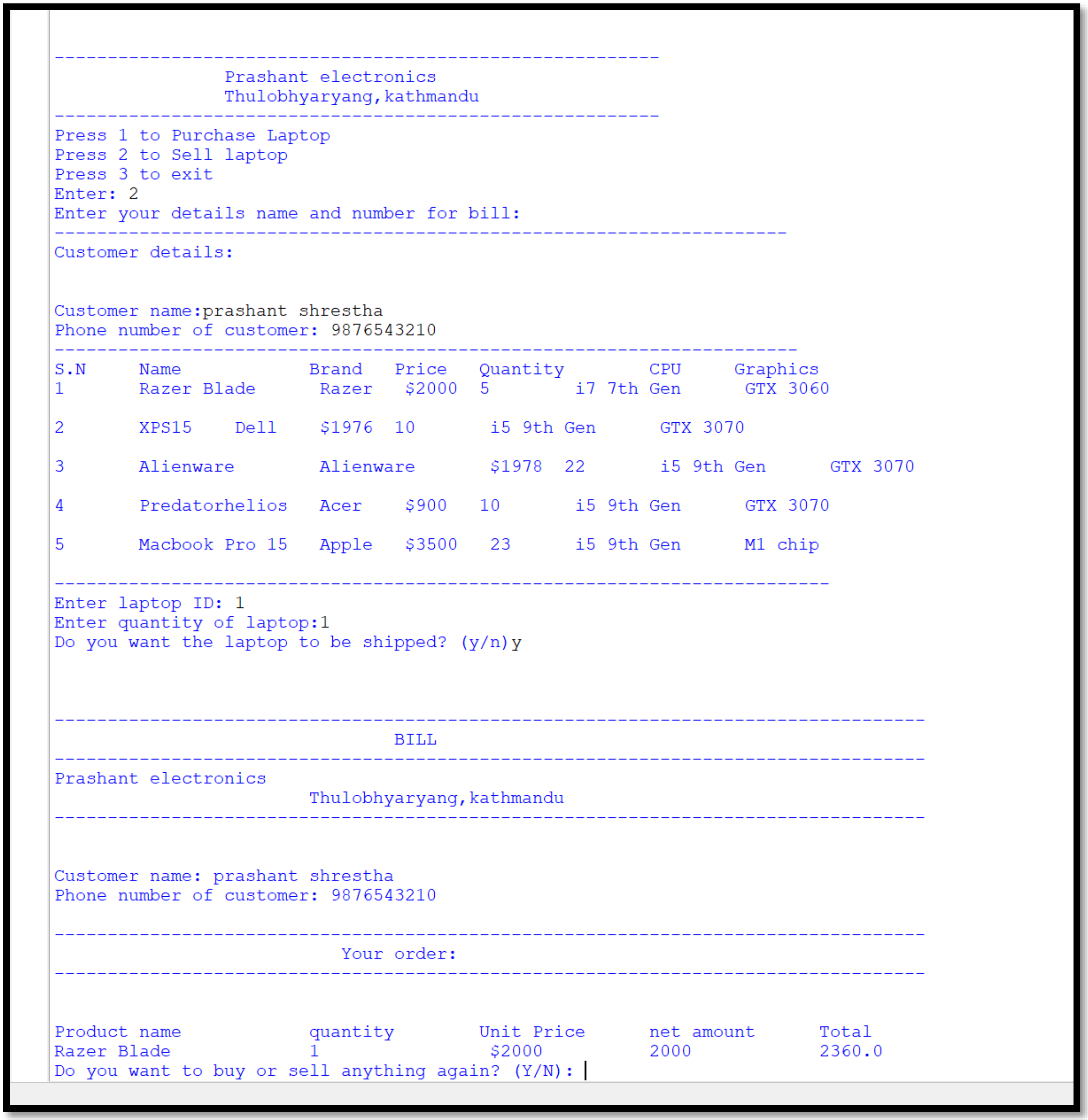
- **When we enter 2 as an input.**

A sell function is trigge red when we enter 2 in the main interface.



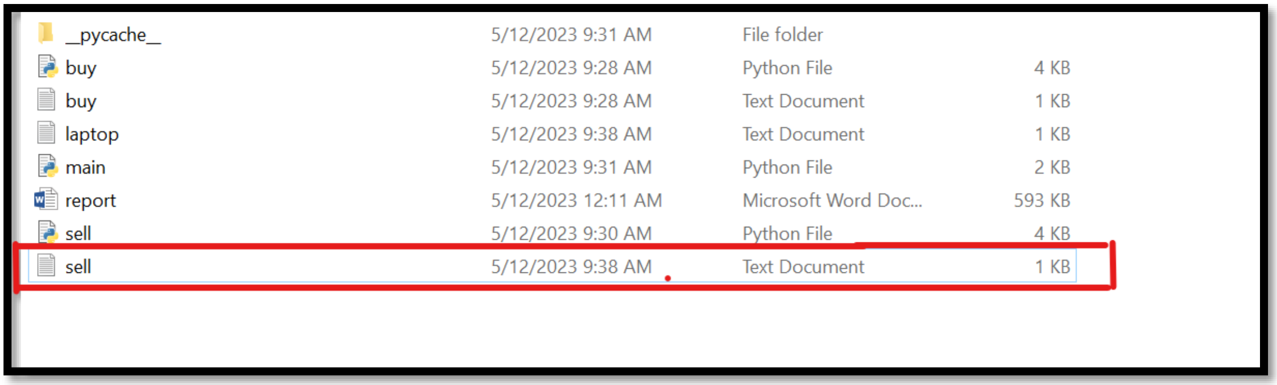
```
---------------------------------------------------------
                Prashant electronics
                Thulobhyaryang,kathmandu
---------------------------------------------------------
Press 1 to Purchase Laptop
Press 2 to Sell laptop
Press 3 to exit
Enter: 2
Enter your details name and number for bill:
---------------------------------------------------------------------
Customer details:


Customer name:prashant shrestha
Phone number of customer: 9876543210
----------------------------------------------------------------------
S.N     Name            Brand   Price   Quantity        CPU     Graphics
1       Razer Blade      Razer   $2000   5         i7 7th Gen      GTX 3060

2       XPS15    Dell    $1976  10       i5 9th Gen      GTX 3070

3       Alienware        Alienware       $1978   22       i5 9th Gen      GTX 3070

4       Predatorhelios   Acer    $900    10        i5 9th Gen      GTX 3070

5       Macbook Pro 15   Apple   $3500   23        i5 9th Gen      M1 chip
```

Figure 11 Selling option



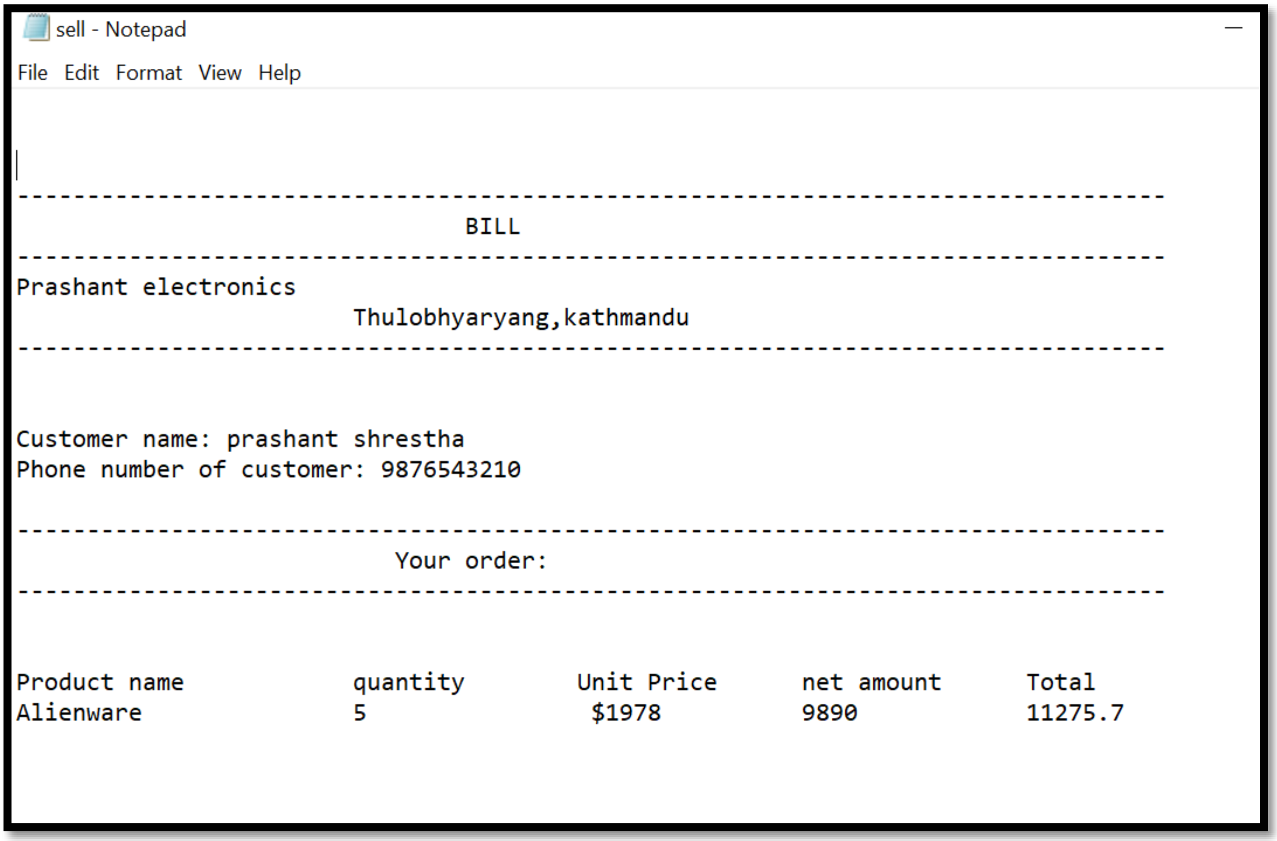
```
---------------------------------------------------------
                Prashant electronics
                Thulobhyaryang,kathmandu
---------------------------------------------------------
Press 1 to Purchase Laptop
Press 2 to Sell laptop
Press 3 to exit
Enter: 2
Enter your details name and number for bill:
---------------------------------------------------------------------
Customer details:


Customer name:prashant shrestha
Phone number of customer: 9876543210
----------------------------------------------------------------------
S.N     Name            Brand   Price   Quantity        CPU     Graphics
1       Razer Blade      Razer   $2000  5        i7 7th Gen      GTX 3060

2       XPS15    Dell    $1976  10       i5 9th Gen      GTX 3070

3       Alienware        Alienware       $1978  22       i5 9th Gen      GTX 3070

4       Predatorhelios   Acer    $900   10       i5 9th Gen      GTX 3070

5       Macbook Pro 15   Apple   $3500   23      i5 9th Gen      M1 chip

-------------------------------------------------------------------------
Enter laptop ID: 1
Enter quantity of laptop:1
Do you want the laptop to be shipped? (y/n)y



----------------------------------------------------------------------------------
                                BILL
----------------------------------------------------------------------------------
Prashant electronics
                        Thulobhyaryang,kathmandu
----------------------------------------------------------------------------------


Customer name: prashant shrestha
Phone number of customer: 9876543210

----------------------------------------------------------------------------------
                           Your order:
----------------------------------------------------------------------------------


Product name            quantity        Unit Price      net amount      Total
Razer Blade             1                $2000          2000            2360.0
Do you want to buy or sell anything again? (Y/N):
```

Figure 12 Complete selling process



pycache	5/12/2023 9:31 AM	File folder	
buy	5/12/2023 9:28 AM	Python File	4 KB
buy	5/12/2023 9:28 AM	Text Document	1 KB
laptop	5/12/2023 9:38 AM	Text Document	1 KB
main	5/12/2023 9:31 AM	Python File	2 KB
report	5/12/2023 12:11 AM	Microsoft Word Doc...	593 KB
sell	5/12/2023 9:30 AM	Python File	4 KB
sell	5/12/2023 9:38 AM	Text Document	1 KB

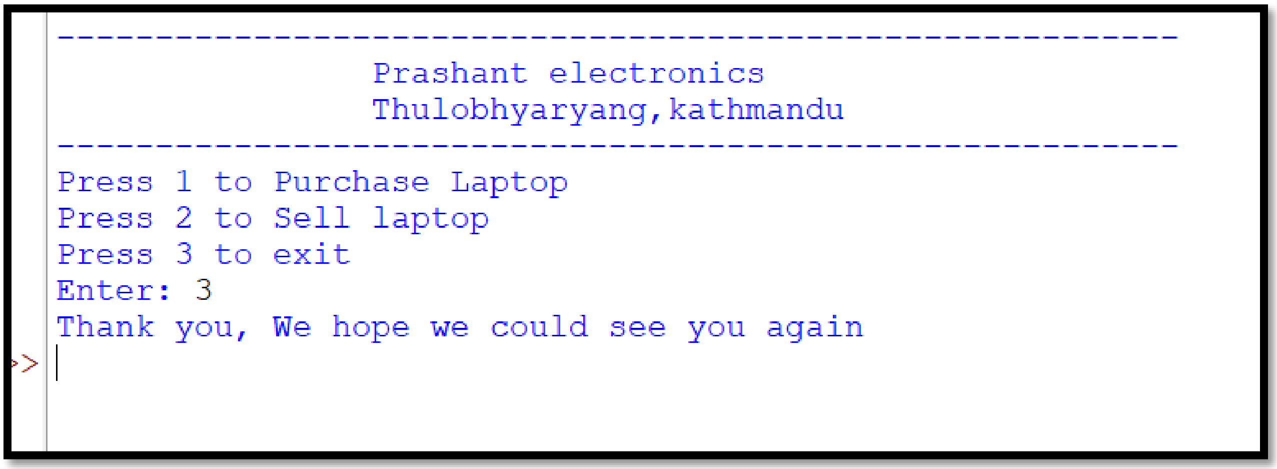
Figure 13 Text file generated for selling



```

--------------------------------------------------------------------------------
                                BILL
--------------------------------------------------------------------------------
Prashant electronics
                        Thulobhyaryang,kathmandu
--------------------------------------------------------------------------------


Customer name: prashant shrestha
Phone number of customer: 9876543210

--------------------------------------------------------------------------------
                           Your order:
--------------------------------------------------------------------------------


Product name            quantity        Unit Price       net amount       Total
Alienware               5                $1978           9890             11275.7
```

Figure 14 Bill generated for selling

- **When we enter 3 as an input.**



```
------------------------------------------------------------
                Prashant electronics
                Thulobhyaryang,kathmandu
------------------------------------------------------------
Press 1 to Purchase Laptop
Press 2 to Sell laptop
Press 3 to exit
Enter: 3
Thank you, We hope we could see you again
>>> 
```

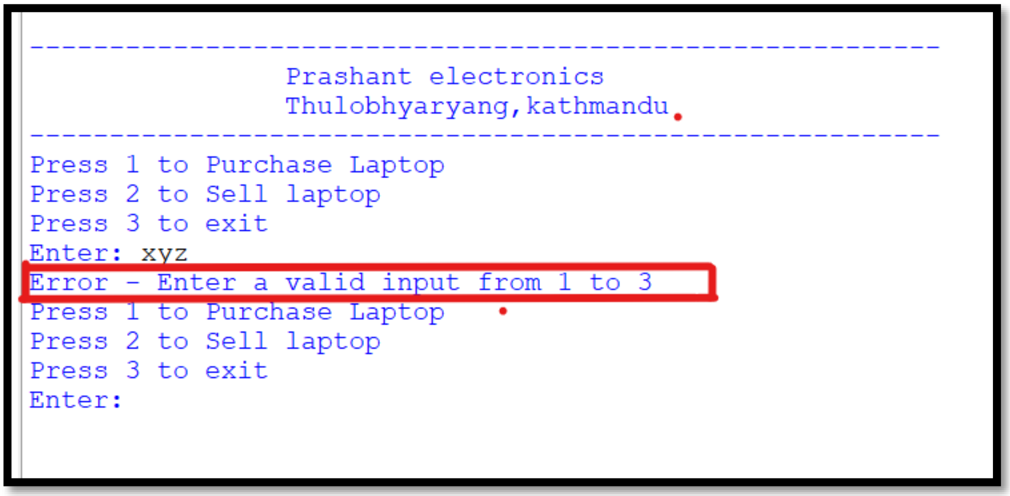
Figure 15 Termination process

7. Testing

7.1. Test 1

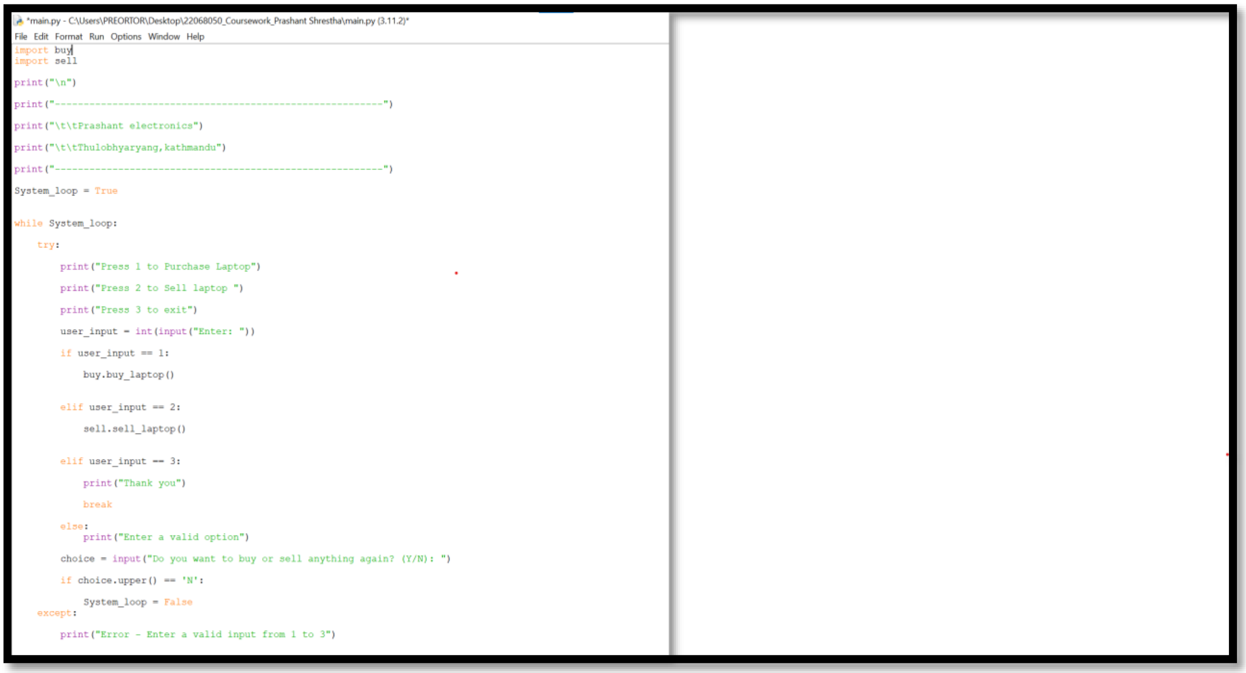
Test 1	
Objective	• Show implementation of try, except
Expected Result	• An error message should be shown.
Actual Result	• An error message was shown.

Table 1 Test Table for try and except block



```
-----------------------------------------------------------------
                  Prashant electronics
                  Thulobhyaryang,kathmandu.
-----------------------------------------------------------------
Press 1 to Purchase Laptop
Press 2 to Sell laptop
Press 3 to exit
Enter: xyz
Error - Enter a valid input from 1 to 3
Press 1 to Purchase Laptop
Press 2 to Sell laptop
Press 3 to exit
Enter:
```

Figure 16 Providing invalid input



main.py - C:\Users\PREORTOR\Desktop\22068050_Coursework_Prashant Shrestha\main.py (3.11.2)
File Edit Format Run Options Window Help

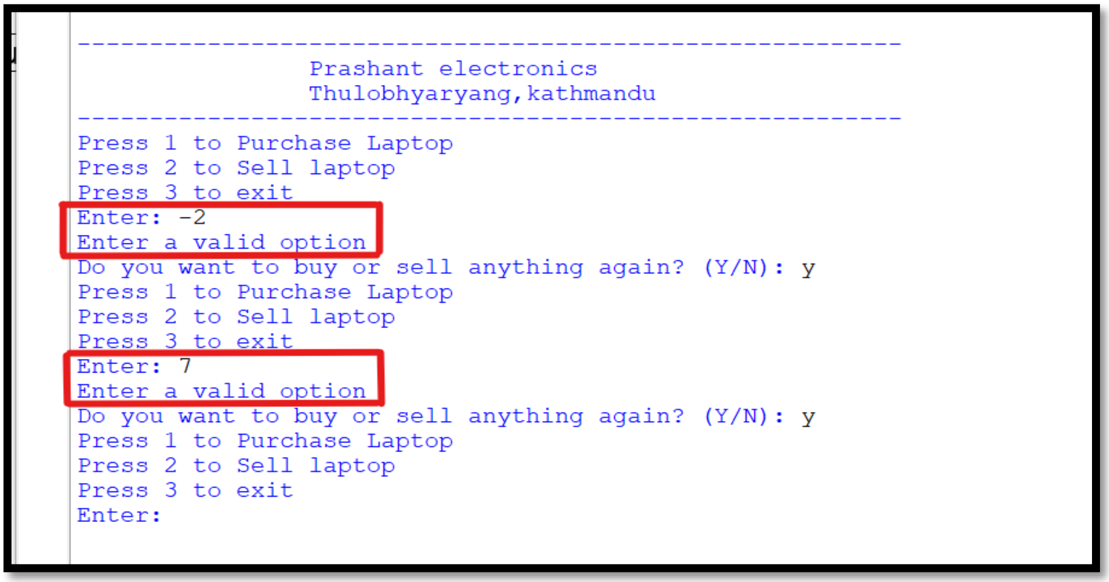
```python
import buy
import sell

print("\n")

print("---------------------------------------------------------")

print("\t\tPrashant electronics")

print("\t\tThulobhyaryang,kathmandu")

print("---------------------------------------------------------")

System_loop = True


while System_loop:

    try:

        print("Press 1 to Purchase Laptop")

        print("Press 2 to Sell laptop ")

        print("Press 3 to exit")

        user_input = int(input("Enter: "))

        if user_input == 1:

            buy.buy_laptop()


        elif user_input == 2:

            sell.sell_laptop()


        elif user_input == 3:

            print("Thank you")

            break

        else:
            print("Enter a valid option")

        choice = input("Do you want to buy or sell anything again? (Y/N): ")

        if choice.upper() == 'N':

            System_loop = False
    except:

        print("Error - Enter a valid input from 1 to 3")
```

Figure 17 Implementation of try and except in code

7.2. Test 2

Test	
Objective	Selection invalid option
Action	• A negative value (-2) was input for the selection of buying process which had options from 1-3. • A value 7 was input for the selection of buying process which had options from 1-3.
Expected Result	• An error message should be shown.
Actual Result	An error message was shown.
Conclusion	The test was successfull

Table 2 Table for Option Selection Errors



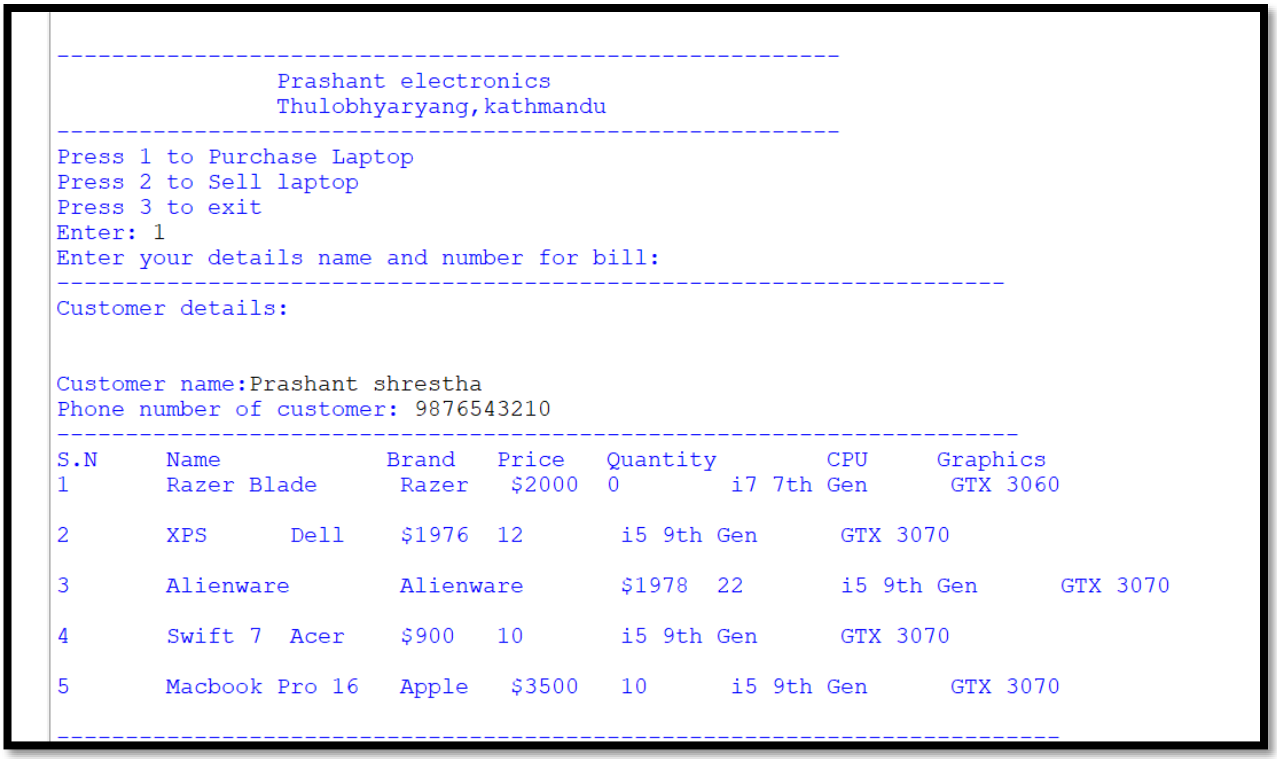
```
---------------------------------------------------------
                Prashant electronics
                Thulobhyaryang,kathmandu
---------------------------------------------------------
Press 1 to Purchase Laptop
Press 2 to Sell laptop
Press 3 to exit
Enter: -2
Enter a valid option
Do you want to buy or sell anything again? (Y/N): y
Press 1 to Purchase Laptop
Press 2 to Sell laptop
Press 3 to exit
Enter: 7
Enter a valid option
Do you want to buy or sell anything again? (Y/N): y
Press 1 to Purchase Laptop
Press 2 to Sell laptop
Press 3 to exit
Enter:
```

Figure 18 Providing the negative and non-existed value as input

7.3. Test 3

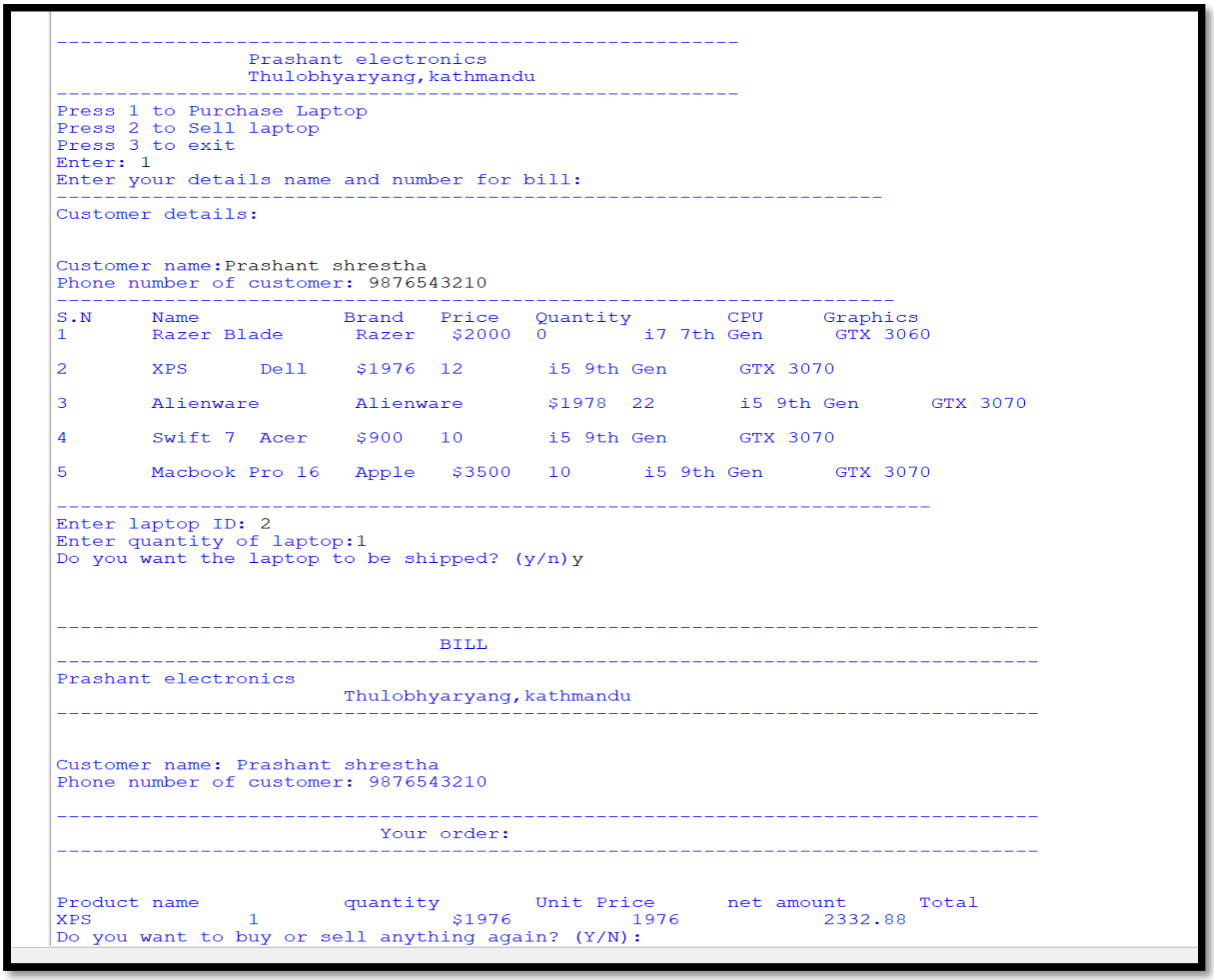
Test	
Objective	To carry out the complete buying process.
Action	• Run the program • Enter 1 to select buying process • Enter the customer name to be displayed in bill • Enter the customer phone number to be displayed in bill • Select laptop you want to buy • Select the quantity
Expected Result	The buying process will be successful and you will get your bill
Actual Result	The buying process is successful and you will get your bill
Conclusion	Test was successful

Table 3 Table for buying process



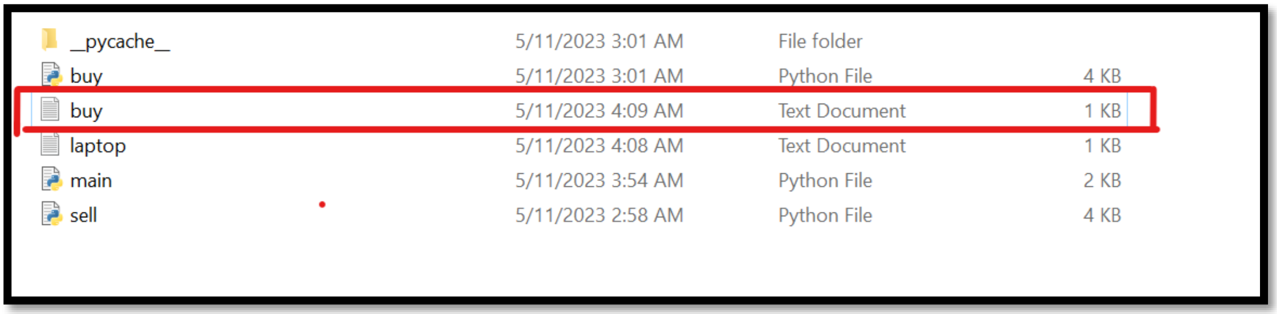
```
---------------------------------------------------------
                Prashant electronics
                Thulobhyaryang,kathmandu
---------------------------------------------------------
Press 1 to Purchase Laptop
Press 2 to Sell laptop
Press 3 to exit
Enter: 1
Enter your details name and number for bill:
---------------------------------------------------------------------
Customer details:


Customer name:Prashant shrestha
Phone number of customer: 9876543210
----------------------------------------------------------------------
S.N     Name            Brand   Price   Quantity        CPU     Graphics
1       Razer Blade      Razer   $2000  0        i7 7th Gen      GTX 3060

2       XPS      Dell    $1976  12       i5 9th Gen      GTX 3070

3       Alienware        Alienware       $1978  22       i5 9th Gen      GTX 3070

4       Swift 7  Acer    $900   10       i5 9th Gen      GTX 3070

5       Macbook Pro 16   Apple   $3500   10      i5 9th Gen      GTX 3070

-------------------------------------------------------------------------
```

Figure 19 Buying Option and stock details



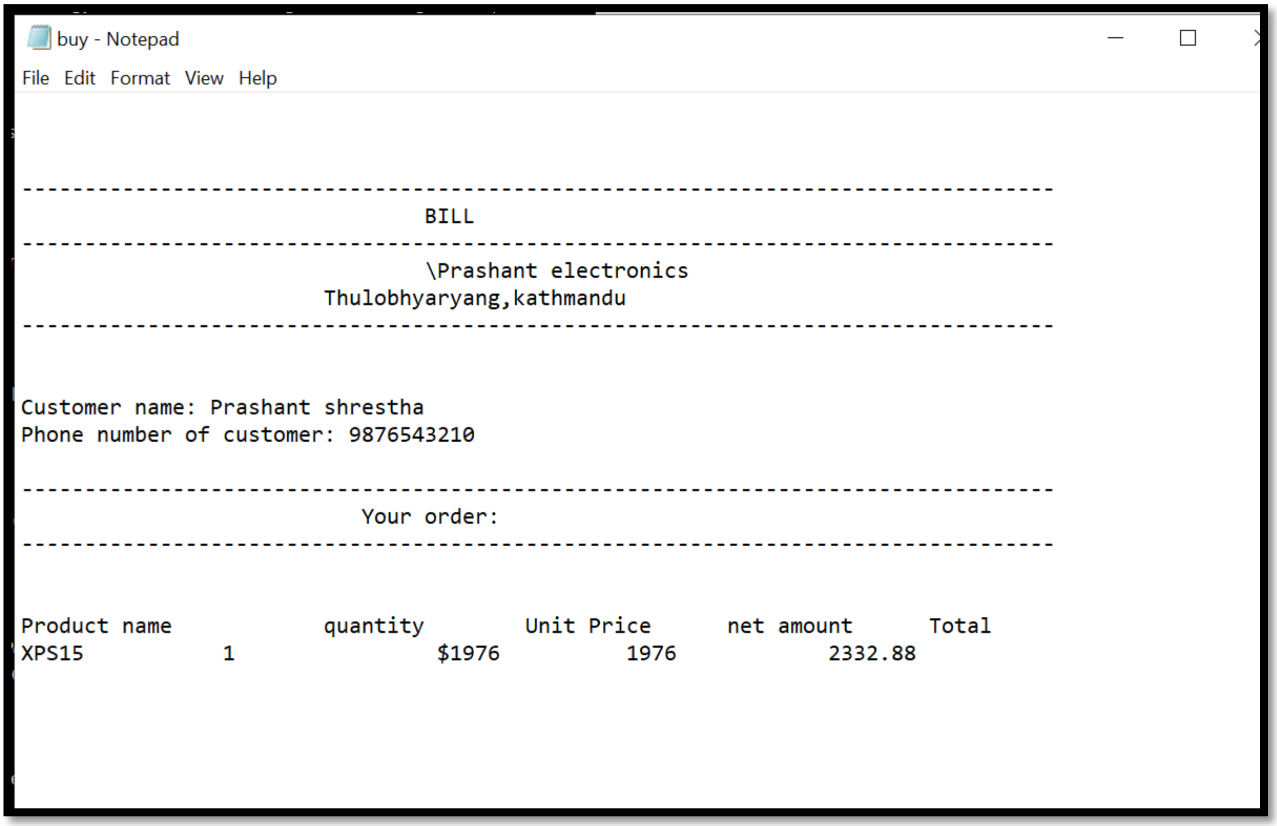
```
---------------------------------------------------------
                Prashant electronics
                Thulobhyaryang,kathmandu
---------------------------------------------------------
Press 1 to Purchase Laptop
Press 2 to Sell laptop
Press 3 to exit
Enter: 1
Enter your details name and number for bill:
---------------------------------------------------------------------
Customer details:


Customer name:Prashant shrestha
Phone number of customer: 9876543210
----------------------------------------------------------------------
S.N     Name            Brand   Price   Quantity        CPU     Graphics
1       Razer Blade      Razer   $2000  0        i7 7th Gen      GTX 3060

2       XPS      Dell    $1976  12       i5 9th Gen      GTX 3070

3       Alienware        Alienware       $1978  22       i5 9th Gen      GTX 3070

4       Swift 7  Acer    $900   10       i5 9th Gen      GTX 3070

5       Macbook Pro 16   Apple   $3500  10       i5 9th Gen      GTX 3070

-----------------------------------------------------------------------
Enter laptop ID: 2
Enter quantity of laptop:1
Do you want the laptop to be shipped? (y/n)y


---------------------------------------------------------------------------------
                                BILL
---------------------------------------------------------------------------------
Prashant electronics
                        Thulobhyaryang,kathmandu
---------------------------------------------------------------------------------


Customer name: Prashant shrestha
Phone number of customer: 9876543210

---------------------------------------------------------------------------------
                           Your order:
---------------------------------------------------------------------------------


Product name            quantity        Unit Price      net amount      Total
XPS             1               $1976           1976            2332.88
Do you want to buy or sell anything again? (Y/N):
```

Figure 20 Buying process



__pycache__	5/11/2023 3:01 AM	File folder	
buy	5/11/2023 3:01 AM	Python File	4 KB
buy	5/11/2023 4:09 AM	Text Document	1 KB
laptop	5/11/2023 4:08 AM	Text Document	1 KB
main	5/11/2023 3:54 AM	Python File	2 KB
sell	5/11/2023 2:58 AM	Python File	4 KB

Figure 21 File creation of buying process



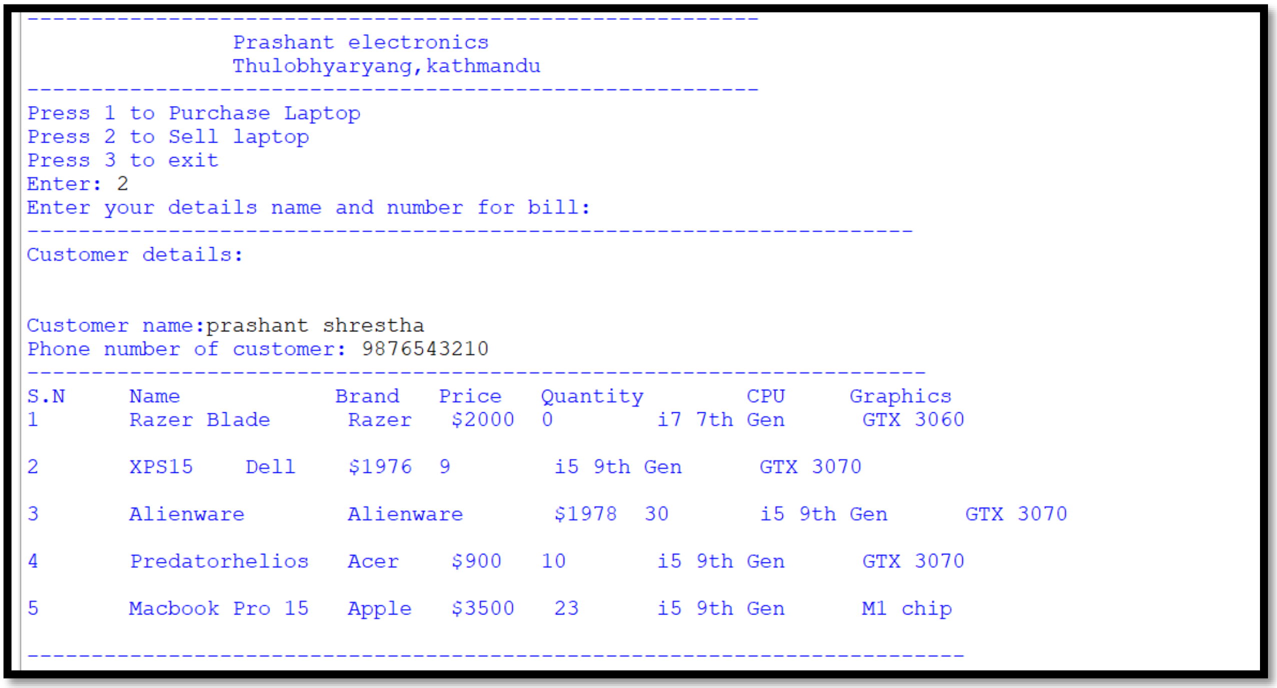
```
---------------------------------------------------------------------------------
                                BILL
---------------------------------------------------------------------------------
                                \Prashant electronics
                        Thulobhyaryang,kathmandu
---------------------------------------------------------------------------------


Customer name: Prashant shrestha
Phone number of customer: 9876543210

---------------------------------------------------------------------------------
                           Your order:
---------------------------------------------------------------------------------


Product name            quantity        Unit Price      net amount      Total
XPS15          1                 $1976          1976            2332.88
```

Figure 22 Bill generated after buying

7.4. Test 4

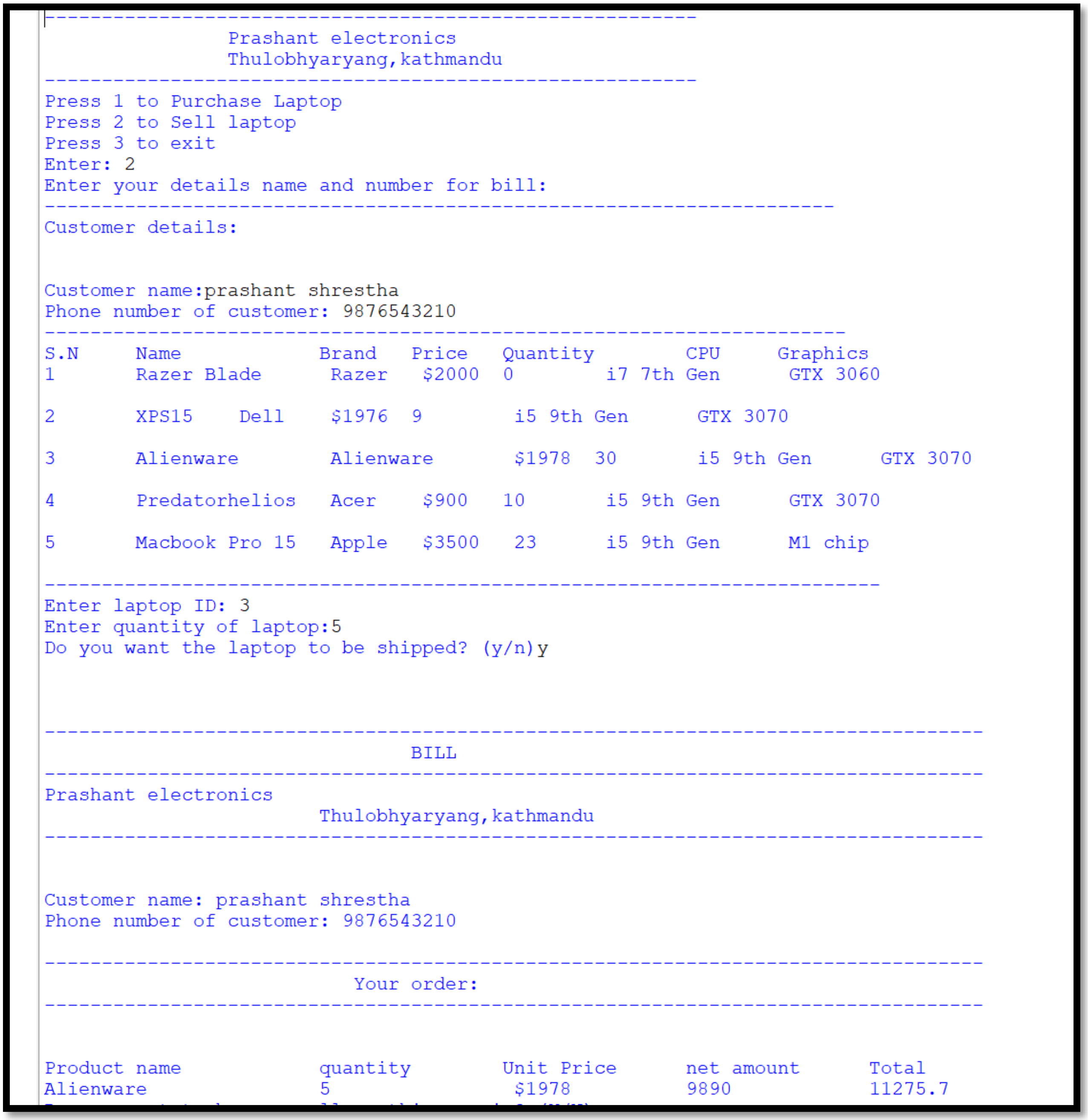
Test	
Objective	To carry out the complete selling process.
Action	• Run the program • Enter 2 to select buying process • Enter the customer name to be displayed in bill • Enter the customer phone number to be displayed in bill • Select laptop • Select the quantity
Expected Result	The selling process will be successful and you will get your bill
Actual Result	The selling process is successful and you will get your bill
Conclusion	Test was successful

Table 4 Table for buying process



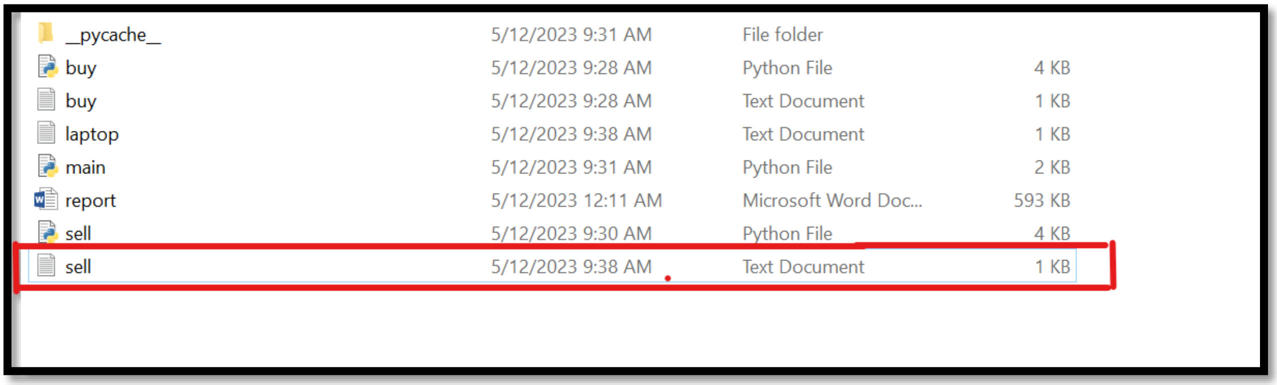
```
---------------------------------------------------------
                Prashant electronics
                Thulobhyaryang,kathmandu
---------------------------------------------------------
Press 1 to Purchase Laptop
Press 2 to Sell laptop
Press 3 to exit
Enter: 2
Enter your details name and number for bill:
---------------------------------------------------------------------
Customer details:


Customer name:prashant shrestha
Phone number of customer: 9876543210
----------------------------------------------------------------------
S.N     Name            Brand   Price   Quantity        CPU     Graphics
1       Razer Blade      Razer   $2000  0        i7 7th Gen      GTX 3060

2       XPS15    Dell    $1976  9        i5 9th Gen      GTX 3070

3       Alienware        Alienware       $1978  30       i5 9th Gen      GTX 3070

4       Predatorhelios   Acer    $900   10       i5 9th Gen      GTX 3070

5       Macbook Pro 15   Apple   $3500   23      i5 9th Gen      M1 chip

-------------------------------------------------------------------------
```

Figure 23 sellingOption and stock details



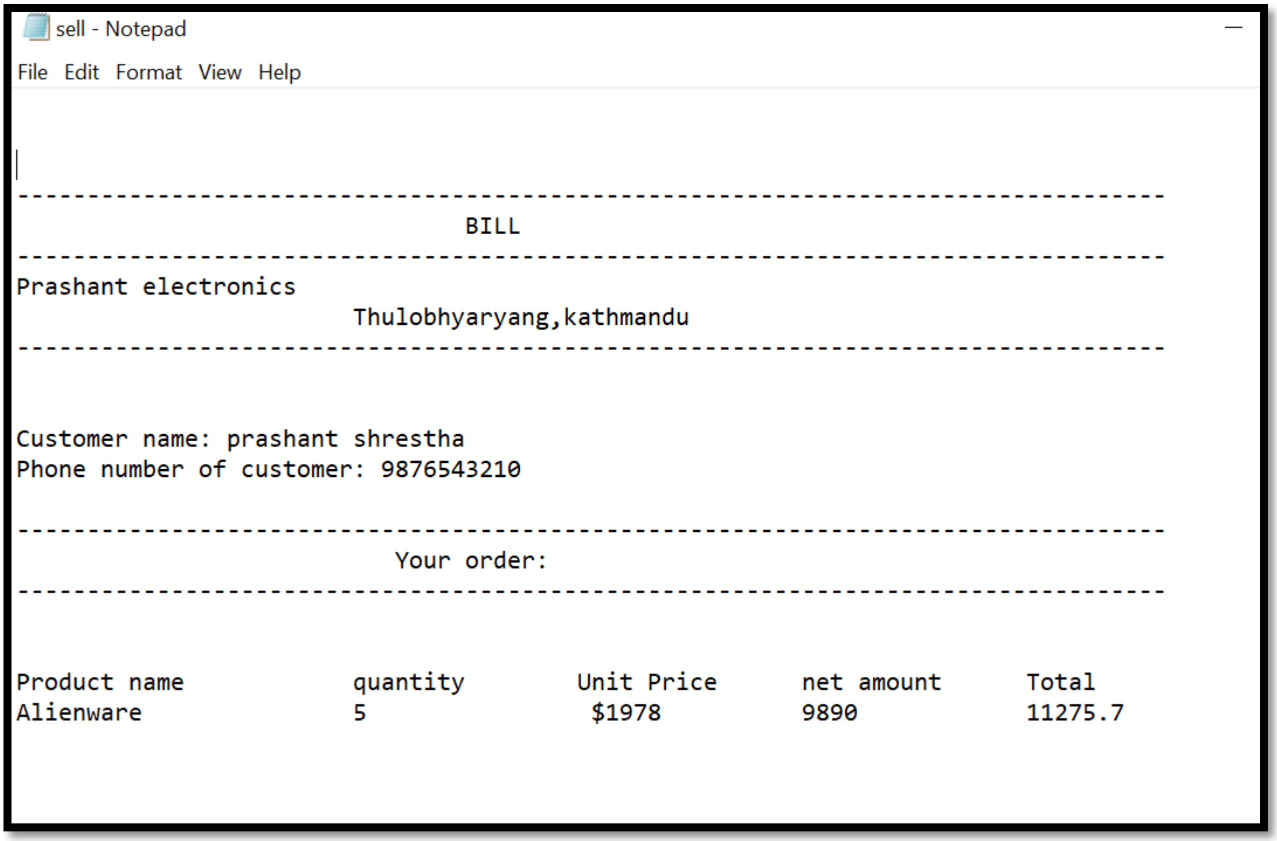
```
---------------------------------------------------------
                Prashant electronics
                Thulobhyaryang,kathmandu
---------------------------------------------------------
Press 1 to Purchase Laptop
Press 2 to Sell laptop
Press 3 to exit
Enter: 2
Enter your details name and number for bill:
---------------------------------------------------------------------
Customer details:


Customer name:prashant shrestha
Phone number of customer: 9876543210
----------------------------------------------------------------------
S.N     Name            Brand   Price   Quantity        CPU     Graphics
1       Razer Blade      Razer   $2000  0        i7 7th Gen      GTX 3060

2       XPS15    Dell    $1976  9        i5 9th Gen      GTX 3070

3       Alienware        Alienware       $1978  30       i5 9th Gen      GTX 3070

4       Predatorhelios   Acer    $900   10       i5 9th Gen      GTX 3070

5       Macbook Pro 15   Apple   $3500   23      i5 9th Gen      M1 chip

--------------------------------------------------------------------------
Enter laptop ID: 3
Enter quantity of laptop:5
Do you want the laptop to be shipped? (y/n)y



-----------------------------------------------------------------------------------
                                BILL
-----------------------------------------------------------------------------------
Prashant electronics
                        Thulobhyaryang,kathmandu
-----------------------------------------------------------------------------------


Customer name: prashant shrestha
Phone number of customer: 9876543210

-----------------------------------------------------------------------------------
                           Your order:
-----------------------------------------------------------------------------------


Product name            quantity        Unit Price      net amount      Total
Alienware               5                $1978          9890            11275.7
```

Figure 24 selling process



pycache	5/12/2023 9:31 AM	File folder	
buy	5/12/2023 9:28 AM	Python File	4 KB
buy	5/12/2023 9:28 AM	Text Document	1 KB
laptop	5/12/2023 9:38 AM	Text Document	1 KB
main	5/12/2023 9:31 AM	Python File	2 KB
report	5/12/2023 12:11 AM	Microsoft Word Doc...	593 KB
sell	5/12/2023 9:30 AM	Python File	4 KB
sell	5/12/2023 9:38 AM	Text Document	1 KB

Figure 25 Selling txt file created



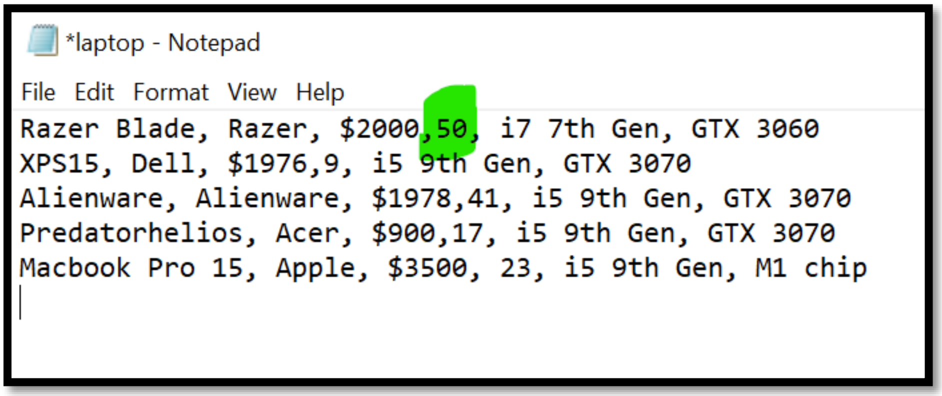
```
----------------------------------------------------------------------------------
                                BILL
----------------------------------------------------------------------------------
Prashant electronics
                        Thulobhyaryang,kathmandu
----------------------------------------------------------------------------------


Customer name: prashant shrestha
Phone number of customer: 9876543210

----------------------------------------------------------------------------------
                           Your order:
----------------------------------------------------------------------------------


Product name            quantity        Unit Price      net amount      Total
Alienware               5                $1978          9890            11275.7
```

Figure 26 Bill generated after selling

7.5. Test 5

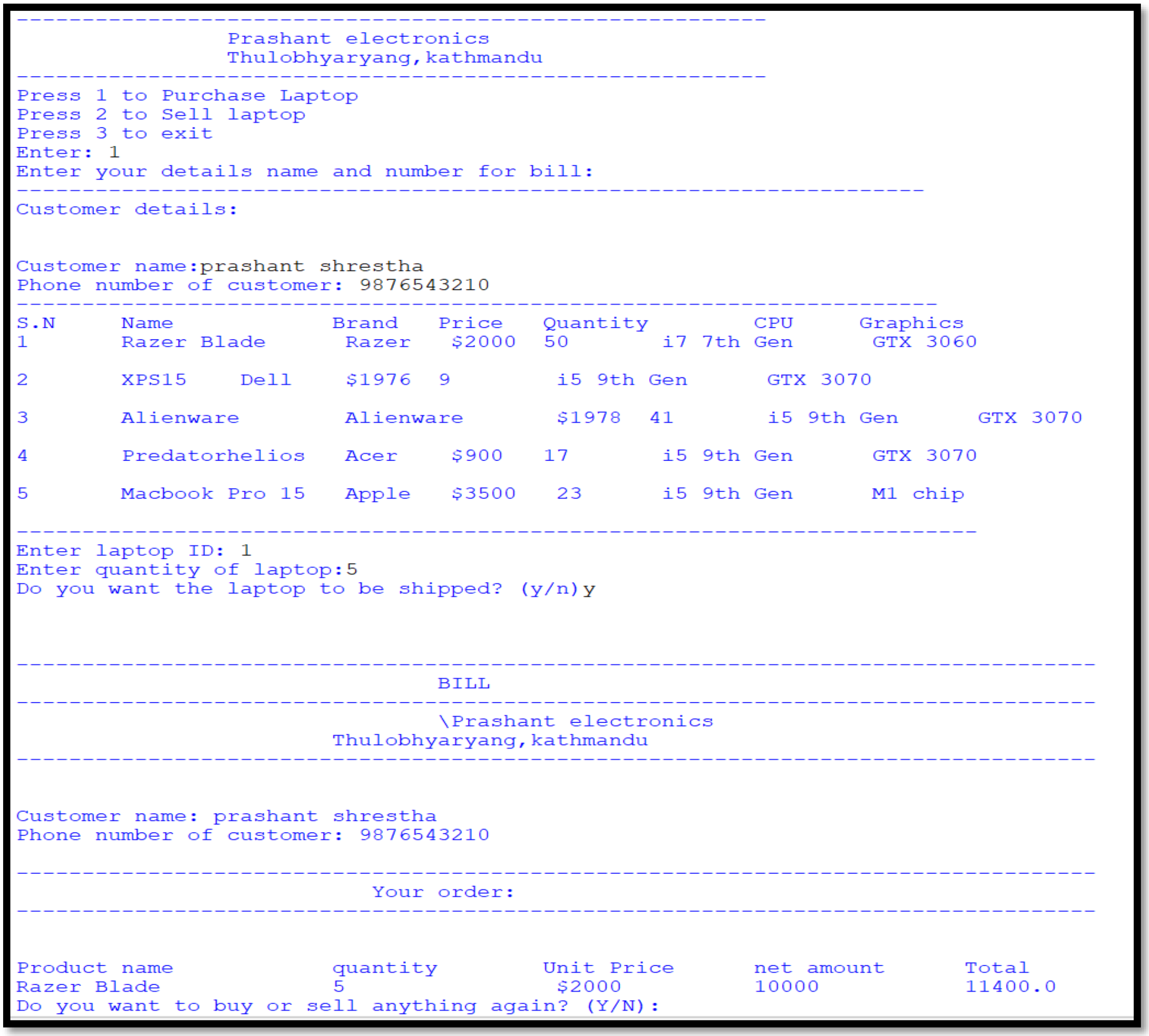
Test	
Objective	To buy and check the quantity of laptop
Action	• Run the system • Buy 5 laptop • Check the quantity of laptop in text file
Expected Result	The selling process will be successful and you will get your bill
Actual Result	The selling process is successful and you will get your bill
Conclusion	Test was successful

Table 5 test 5



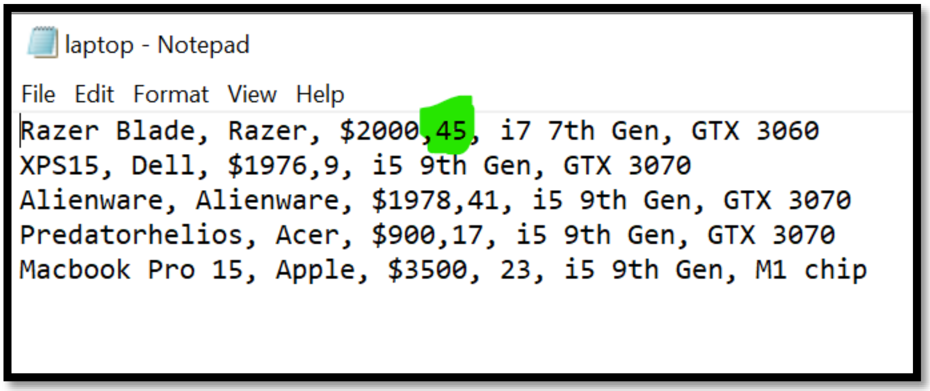
```
Razer Blade, Razer, $2000,50, i7 7th Gen, GTX 3060
XPS15, Dell, $1976,9, i5 9th Gen, GTX 3070
Alienware, Alienware, $1978,41, i5 9th Gen, GTX 3070
Predatorhelios, Acer, $900,17, i5 9th Gen, GTX 3070
Macbook Pro 15, Apple, $3500, 23, i5 9th Gen, M1 chip
```

Figure 27 quantity before buying



```
---------------------------------------------------------
                Prashant electronics
                Thulobhyaryang,kathmandu
---------------------------------------------------------
Press 1 to Purchase Laptop
Press 2 to Sell laptop
Press 3 to exit
Enter: 1
Enter your details name and number for bill:
---------------------------------------------------------------------
Customer details:


Customer name:prashant shrestha
Phone number of customer: 9876543210
----------------------------------------------------------------------
S.N     Name            Brand   Price   Quantity        CPU     Graphics
1       Razer Blade      Razer   $2000  50       i7 7th Gen      GTX 3060

2       XPS15    Dell    $1976  9        i5 9th Gen      GTX 3070

3       Alienware        Alienware       $1978  41       i5 9th Gen      GTX 3070

4       Predatorhelios   Acer    $900   17       i5 9th Gen      GTX 3070

5       Macbook Pro 15   Apple   $3500   23      i5 9th Gen      M1 chip

-------------------------------------------------------------------------
Enter laptop ID: 1
Enter quantity of laptop:5
Do you want the laptop to be shipped? (y/n)y



----------------------------------------------------------------------------------
                                BILL
----------------------------------------------------------------------------------
                                \Prashant electronics
                        Thulobhyaryang,kathmandu
----------------------------------------------------------------------------------


Customer name: prashant shrestha
Phone number of customer: 9876543210

----------------------------------------------------------------------------------
                           Your order:
----------------------------------------------------------------------------------


Product name            quantity        Unit Price      net amount      Total
Razer Blade             5                $2000          10000           11400.0
Do you want to buy or sell anything again? (Y/N):
```

Figure 28 Buying process



```
Razer Blade, Razer, $2000,45, i7 7th Gen, GTX 3060
XPS15, Dell, $1976,9, i5 9th Gen, GTX 3070
Alienware, Alienware, $1978,41, i5 9th Gen, GTX 3070
Predatorhelios, Acer, $900,17, i5 9th Gen, GTX 3070
Macbook Pro 15, Apple, $3500, 23, i5 9th Gen, M1 chip
```

Figure 29 quantity after buying laptop

8. Conclusion

Through this study, I became more familiar with the Python programming language. I can now sort of see how Python might be an important part of programming. Personally, I believe the project was a little difficult because we had to create a lengthy, skillful, and labor-intensive application. I had to carefully structure the software while developing pseudocode and algorithms for each procedure. I also discovered how to plan and understand a structure using chart diagrams. Through this coursework, I have the opportunity to study a lot of new things. I learned about file handling in programming as well as the numerous functions, commands, statements, arrays, and other tools needed to make programs.

I also had the chance to design the terminal and the text file that was output by the application, and I used this opportunity to improve the application's overall quality by accurately arranging things like text messages and line spacing. Overall, because it was challenging and research-based, the project was enjoyable to do. A number of subjects pertaining to situational awareness were also made clear to me. Programming with objects and conditional statements. By completing this project, I feel as though I will be that much closer to using the programs to address issues in real-world situations. The antiquated, manual process of renting out and returning objects can be replaced with this program.

I encountered numerous challenges while developing the project, which led to a was coding with a great deal of uncertainty and confusion. Similarly, I had a few challenges while preparing the project report. For the project's completion, I sought assistance from my tutor and from a variety of websites, including w3school, GeeksforGeeks, towards data science, and many other random web searches. With this support, along with the lecture materials provided by the university and college,

9. Appendix

9.1. Code of Main.py file

```
import buy

import sell



print("\n")


print("----------------------------------------------------------------")


print("\t\tPrashant electronics")


print("\t\tThulobhyaryang,kathmandu")


print("----------------------------------------------------------------")


System_loop = True



while System_loop:


    try:


        print("Press 1 to Purchase Laptop")


        print("Press 2 to Sell laptop ")
        print("Press 3 to exit")

        user_input = int(input("Enter: "))

        if user_input == 1:

            buy.buy_laptop()



        elif user_input == 2:

            sell.sell_laptop()



        elif user_input == 3:

            print("Thank you, We hope we could see you again")

            break

        else:
            print("Enter a valid option")

        choice = input("Do you want to buy or sell anything again? (Y/N): ")

        if choice.upper() == 'N':

            System_loop = False
    except:

        print("Error - Enter a valid input from 1 to 3")
```

9.2. Code of buy.py file

```
file = open("laptop.txt", "r")

mydict = {}

lap_id = 1



for line in file:

    line = line.replace("\n", "")

    mydict[lap_id] = line.split(",")

    lap_id += 1
```

```
def buy_laptop():

    print("Enter your details name and number for bill: ")

    print("-----------------------------------------------------------------")



    print("Customer details:")

    print("\n")

    name = input("Customer name:")

    phone = input("Phone number of customer: ")

    while len(phone) != 10:

        try:

            phone = input("Phone number of customer : ")

        except ValueError:

            print("Invalid input")
    print("------------------------------------------------------------------------")

    print("S.N\tName\t\tBrand\tPrice\tQuantity\tCPU\tGraphics")

    a = 1

    file = open('laptop.txt', 'r')

    for line in file:

        print(a, "\t"+line.replace(",", "\t"))

        a += 1

    file.close()

    print("---------------------------------------------------------------------------")



    valid_id = int(input("Enter laptop ID: "))

    while valid_id <= 0 or valid_id > len(mydict):

        print("Error please enter again")
```

```
        valid_id = int(input("Enter laptop ID: "))



    user_quantity = int(input("Enter quantity of laptop:"))



    get_quantity = mydict[valid_id][3]

    while user_quantity <= 0 or user_quantity > int(get_quantity):

        print("Quantity invalid ")

        user_quantity = int(input("Enter quantity of laptop:"))



    mydict[valid_id][3] = int(mydict[valid_id][3]) - int(user_quantity)

    file = open('laptop.txt', 'w')



    for values in mydict.values():

        file.write(str(values[0])+","+str(values[1])+","+str(values[2]) +
                   ","+str(values[3])+","+str(values[4])+","+str(values[5]))
        file.write("\n")
    file.close()


    product_name = str(mydict[valid_id][0])
    user_quantity = str(user_quantity)
    per_price = str(mydict[valid_id][2])
    price = str(mydict[valid_id][2].replace("$", ""))
    amount = str(int(price)*int(user_quantity))
    tot = str(float(int(amount)+(0.13)*(int(amount))))


    shipping_cost = input(
        "Do you want the laptop to be shipped? (y/n)").lower()
    if shipping_cost == "y":
        tot = str(float(tot)+100)

    dir = [product_name, user_quantity, per_price, amount, tot]

    with open('buy.txt', 'w') as buy:

        buy.write(
            "\n\n\n--------------------------------------------------------------------------------\n")
        buy.write("\t\t\t\tBILL\n")
        buy.write(
            "--------------------------------------------------------------------------------\n")
        buy.write("\t\t\t\t\Prashant electronics\n")
        buy.write("\t\t\tThulobhyaryang,kathmandu\n")
        buy.write(
            "-------------------------------------------------------------------------------------\n\n")



        buy.write("\nCustomer name: "+name+"\n")

        buy.write("Phone number of customer: "+phone+"\n")

        buy.write("\n")

        buy.write(

            "-------------------------------------------------------------------------------------\n")

        buy.write("\t\t\t   Your order:\n")

        buy.write(

            "-------------------------------------------------------------------------------------\n")

        buy.write(

             "\n\nProduct name\t\tquantity\tUnit Price\tnet amount\tTotal\n")

        for i in dir:

            buy.write(i+"\t\t")
            f = open('buy.txt', 'r')

            inside = f.read()

            print(inside)

            f.close()
```

9.3. Code of sell.py file

```
file = open("laptop.txt", "r")

mydict = {}

lap_id = 1
```

```
for line in file:

    line = line.replace("\n", "")

    mydict[lap_id] = line.split(",")

    lap_id += 1




def sell_laptop():

    print("Enter your details name and number for bill: ")

    print("------------------------------------------------------------------")



    print("Customer details:")

    print("\n")

    name = input("Customer name:")

    phone = input("Phone number of customer: ")
```

```
while len(phone) != 10:

    try:

        phone = input("Phone number of customer : ")

    except ValueError:

        print("Invalid input")



print("------------------------------------------------------------------------")

print("S.N\tName\t\tBrand\tPrice\tQuantity\tCPU\tGraphics")

a = 1

file = open('laptop.txt', 'r')

for line in file:

    print(a, "\t"+line.replace(",", "\t"))

    a += 1

file.close()
```

```
    print("---------------------------------------------------------------------------")



    valid_id = int(input("Enter laptop ID: "))

    while valid_id <= 0 or valid_id > len(mydict):

        print("Error please enter again")

        valid_id = int(input("Enter laptop ID: "))



    user_quantity = int(input("Enter quantity of laptop:"))



    get_quantity = mydict[valid_id][3]

    while user_quantity <= 0 or user_quantity > int(get_quantity):

        print("Quantity invalid ")

        user_quantity = int(input("Enter quantity of laptop:"))
    mydict[valid_id][3] = int(mydict[valid_id][3]) + int(user_quantity)

    file = open('laptop.txt', 'w')


    for values in mydict.values():

        file.write(str(values[0])+","+str(values[1])+","+str(values[2]) +

                   ","+str(values[3])+","+str(values[4])+","+str(values[5]))

        file.write("\n")

    file.close()


    product_name = str(mydict[valid_id][0])

    user_quantity = str(user_quantity)

    per_price = str(mydict[valid_id][2])

    price = str(mydict[valid_id][2].replace("$", ""))

    amount = str(int(price)*int(user_quantity))
    tot = str(float(int(amount)+(0.13)*(int(amount))))



    shipping_cost = input(

        "Do you want the laptop to be shipped? (y/n)").lower()

    if shipping_cost == "y":

        tot = str(float(tot)+100)




    dir = [product_name, user_quantity, per_price, amount, tot]



    with open('buy.txt', 'w') as buy:



        buy.write(

            "\n\n\n----------------------------------------------------------------------------\n")
        buy.write("\t\t\t\tBILL\n")

        buy.write(

            "-------------------------------------------------------------------------------\n")

        buy.write("Prashant electronics\n")

        buy.write("\t\t\tThulobhyaryang,kathmandu\n")

        buy.write(

            "-------------------------------------------------------------------------------\n\n")



        buy.write("\nCustomer name: "+name+"\n")

        buy.write("Phone number of customer: "+phone+"\n")

        buy.write("\n")

        buy.write(

            "-------------------------------------------------------------------------------\n")

        buy.write("\t\t\t   Your order:\n")
```

```
        buy.write(

            "---------------------------------------------------------------------------------------\n")

        buy.write(

            "\n\nProduct name\t\tquantity\tUnit Price\tnet amount\tTotal\n")

        for i in dir:

            buy.write(i+"\t\t")



    f = open('buy.txt', 'r')

    inside = f.read()

    print(inside)

    f.close()
```