LONDON METROPOLITAN UNIVERSITY

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Choose a Module

60% Individual Coursework

2023 Spring

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Project File Links:

YouTube Link:	Keep Unlisted YouTube URL of your Project Here
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TABLE OF CONTENTS

Contents

TABLE OF FIGURES

INTRODUCTION

Programming and computing system has been used to manage business sector for many decades, and it has only progressed in our current generation with the digital supremacy. The more the time goes, the more advanced technologies are required to handle business tasks via computer system.

In our Fundamentals of Computing coursework, we were required to use Python's various functions to solve a real life scenario. The scenario involves specifically a laptop shop and its organization defined by the question itself. This task, assigned by the module leader, Hrishav Tandukar and rest of the team is worth 60% of the total first year module. I wouldn’t say this was an easy task, but definitely a fun one and the one I am going to remember for the rest of my career.

With this project, the main end goal was to access our expertise in Python programming language. We were needed to develop a reliable program that could read and modify a text file containing information about the available laptops in a rental shop. For each and every transaction, we were supposed to generate a note or invoice including the details of the transaction and update the stock in the text file. This would automate the process of ordering from manufacturers and sell to customers, thereby increasing the efficiency and reducing errors.

As for the objectives, we were required to develop a program that can read and display the laptops available in the rental shop text file. To develop a program that can modify the stock of a particular laptop in the rental shop text file when a purchase is made from a customer or a specific laptop is sold to a customer. To develop a program that can generate a note/invoice for each transaction, including the details of the transaction and updating the text file. To develop a program that can automate the process of ordering from different manufacturers as a shop by generating a note/invoice that includes the necessary details and updating the text file.

Furthermore, the objective was also to ensure that the program was super use friendly and relatively easy to use, and to ensure that the program is reliable, accurate as well as very secure. Secure in a sense that the confidentiality of customer is well-protected. This system was definitely fun to develop and is presented below in this report.

ALGORITHM

Step 1: Start.

Step 2: Import datetime module of python.

Step 3: Define a function called readfile(filename).

Step 4: Initialise an empty dictionary called "laptopinfo".

Step 5: Open the file "stock.txt" using the open () function in read mode.

Step 6: Use readlines () function to put items of text file in a list called "lines" and close the file.

Step 7: Loop through each line in "lines".

Step 8: Split the line into items using "," .

Step 9: Extract the laptop details add it into the laptopinfo dictionary.

Step 10: Return laptopinfo

Step 11: Define a function called display(laptopinfo).

Step 12: Display a table header with Laptopname, companyname, price, quantity, processor and graphics.

Step 13: Loop through the laptopinfo dictionary and print each laptop's details in a formatted manner under suitable headers.

Step 14: Call the readfile(stock.txt) function and assign it to laptopinfo.

Step 15: Call the display(laptopinfo) function.

Step 16: Define a function called ordernote (laptopname, distributorname, companyname, purchasedatetime, netamount).

Step 17: Format purchasedatetime to a string.

Step 18: Make VAT and Amount after VAT calculations.

Step 19: Open "Order.txt" in write mode.

Step 20: Write those order details to the file and close the file.

Step 21: Define a function called Order(laptopinfo).

Step 22: Ask the user to input laptop and distributor name.

Step 23: If distributor name is empty, ask the user to re write it.

Step 24: Verify if entered laptop name exists in laptopinfo dictionary.

Step 25: Prompt the user to input quantity of laptops to order.

Step 26: Calculate net amount based on laptop and its quantity.

Step 27: Get the current date and time using datetime.datetime.now().

Step 28: Call the ordernote function to get invoice/bill and save it to Order.txt.

Step 29: After ordering, update quantity in laptopinfo dictionary.

Step 30: Read the Order.txt and print its content to the user.

Step 31: Define a function called salenote(laptopname, companyname, customername, purchasedatetime, totalamount, shippingcost).

Step 32: Format the purchasedatetime to a string.

Step 33: Calculation of totalamount including shipping cost.

Step 34: Open Sell.txt file in write mode and write sale details to the file.

Step 35: Close the file.

Step 36: Define a function called sell(laptopinfo).

Step 37: Ask the user what laptop to sell.

Step 38: Verify if the laptopname exists in laptopinfo dictionary.

Step 39: Prompt the user to input quantity of laptop to sell.

Step 40: Check if the quantity is available in stock.

Step 41: If it is, calculate the total amount including the shipping cost.

Step 42: Ask the user to input customer name.

Step 43: Get the current datetime using datetime.datetime.now().

Step 44: Call the function salenote to get invoice and save it to Sell.txt.

Step 45: Update the quantity sold in dictionary.

Step 46: Read Sell.txt and print its content.

Step 47: Define a function called mainloop().

Step 48: Display an interface to the user where user is asked to buy sell or exit the program.

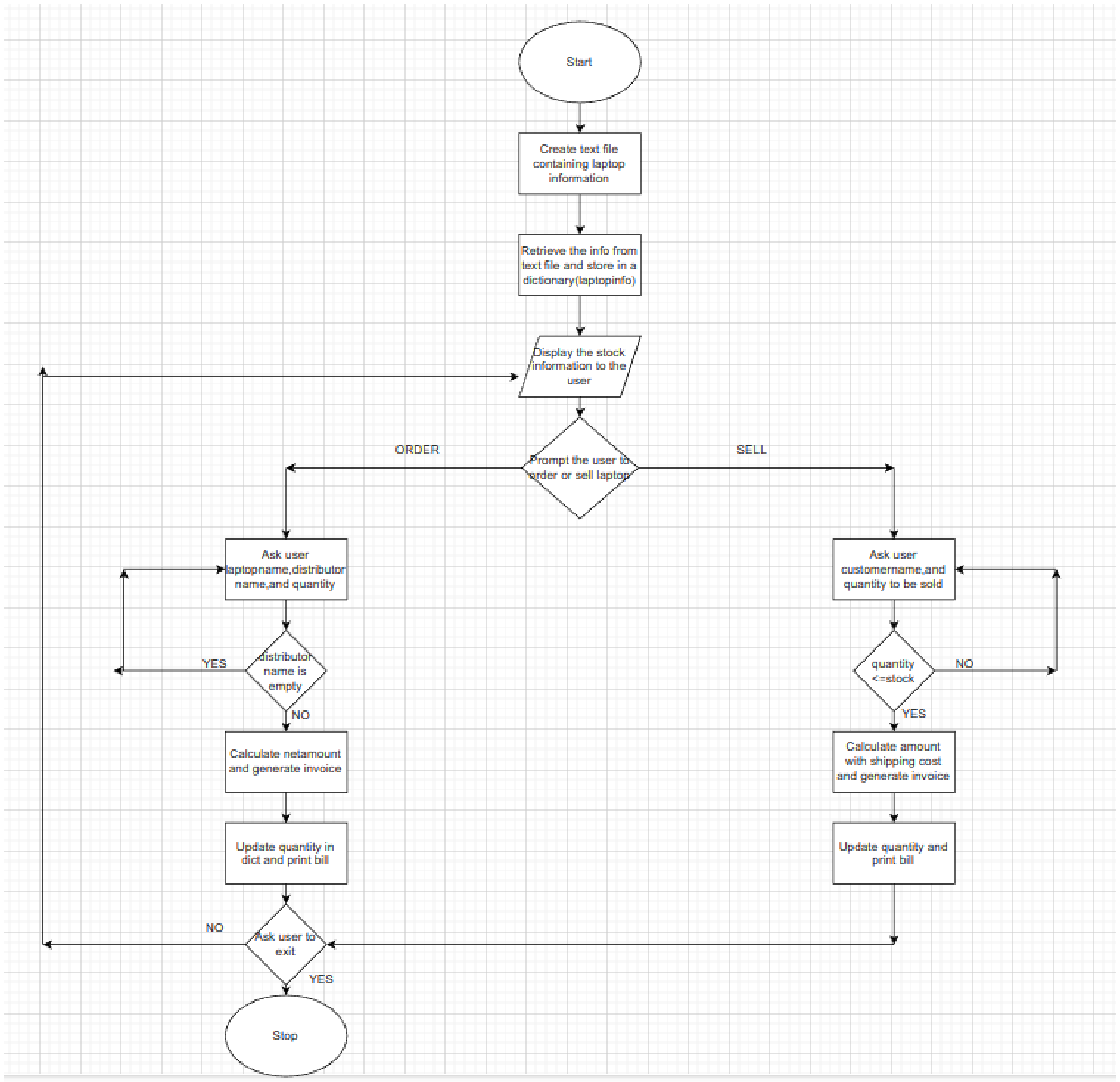
Step 49: Based on user's choice call "order()" , " sell()" or terminate the loop using break statement.

Step 50: Update "stock.txt" with updated values and display it by calling display(laptopinfo) function.

Step 51: Call the mainloop() function and let the program start.

Step 52: End.

FLOWCHART

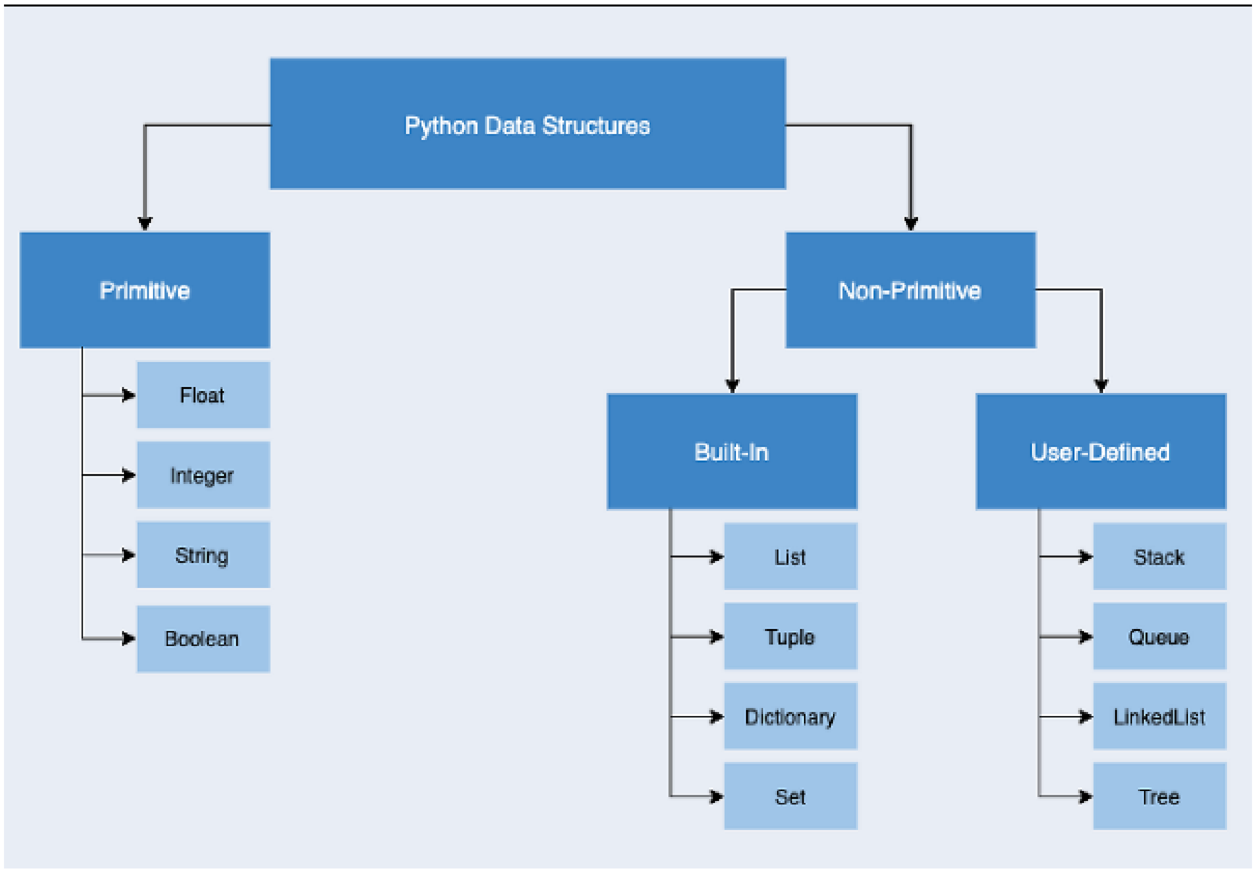


Start
Create text file containing laptop information
Retrieve the info from text file and store in a dictionary(laptopinfo)
Display the stock information to the user
Prompt the user to order or sell laptop
ORDER
SELL
Ask user laptopname,distributor name,and quantity
distributor name is empty
YES
NO
Calculate netamount and generate invoice
Update quantity in dict and print bill
Ask user customername,and quantity to be sold
quantity <=stock
NO
YES
Calculate amount with shipping cost and generate invoice
Update quantity and print bill
Ask user to exit
NO
YES
Stop

Figure 1: flowchart of project

DATA STRUCTURES

There are two kinds of Data Structures: PRIMITIVE and NON PRIMITIVE



In Python, Primitive data structures, are also known as built-in or basic data types. They are known to be the simplest and most fundamental data types that a programming language, such a Python provides. These kind of data types are used to represent basic values without any user defined structures.

Here are the Primitive data structures used in this project:

INTEGER(INT): Represents whole numbers without decimal points. They can be positive negative or 0.

FLOAT: Represents real numbers with decimal points. Examples are 1.00.2.30,etc

STRING: Represents alphabetical or text data. They are always enclosed within single or double quotes.

BOOLEAN: Represents logical values i.e. it can only be one of TRUE or FALSE.

They can be used to loop and take the control flow of the program.

Non Primitive Data Structures, in Python are the containers that are used to store various data as well as organise them in a specific way. Data Structures make it very easy and comfortable for the code users to access, manipulate and manage data effectively. In Python, we have several built-in data structures which serve various purposes and can be used in different contexts. By various contexts, it means that we can use these structures to do specific tasks. For example, if we want a structured organisation of data, which can also be edited later and made changes, we use list or dictionaries. If we do not want to change anything with the data or not touch the data at all we can use Tuple.

Here are some of the non-primitive data structures I have used in this project:

LIST: Lists are ordered collection of items which is editable and can contain various data types. They are denoted by Square brackets and are mutable. They also allow duplicate elements.

DICTIONARY: Dictionaries are key value pairs which helps to store data according to key and value mappings. They are denoted by curly brackets and every key value is separated by colons. They are mainly used to retrieve data and manipulate them.

PROGRAM

I have made a python program that simulates an inventory management system for a tech shop that sells and orders laptops.

The program first reads all the laptop information from stock.txt and stores it in a dictionary named 'laptopinfo'. After reading the data from the file, the program displays the same information to the user using the display function. The information includes laptop name, company name, price, quantity, processor and graphics of laptops.

The program's main logic is the loop that runs until user is satisfied. The user is asked to either order laptops or sell laptops to customer.

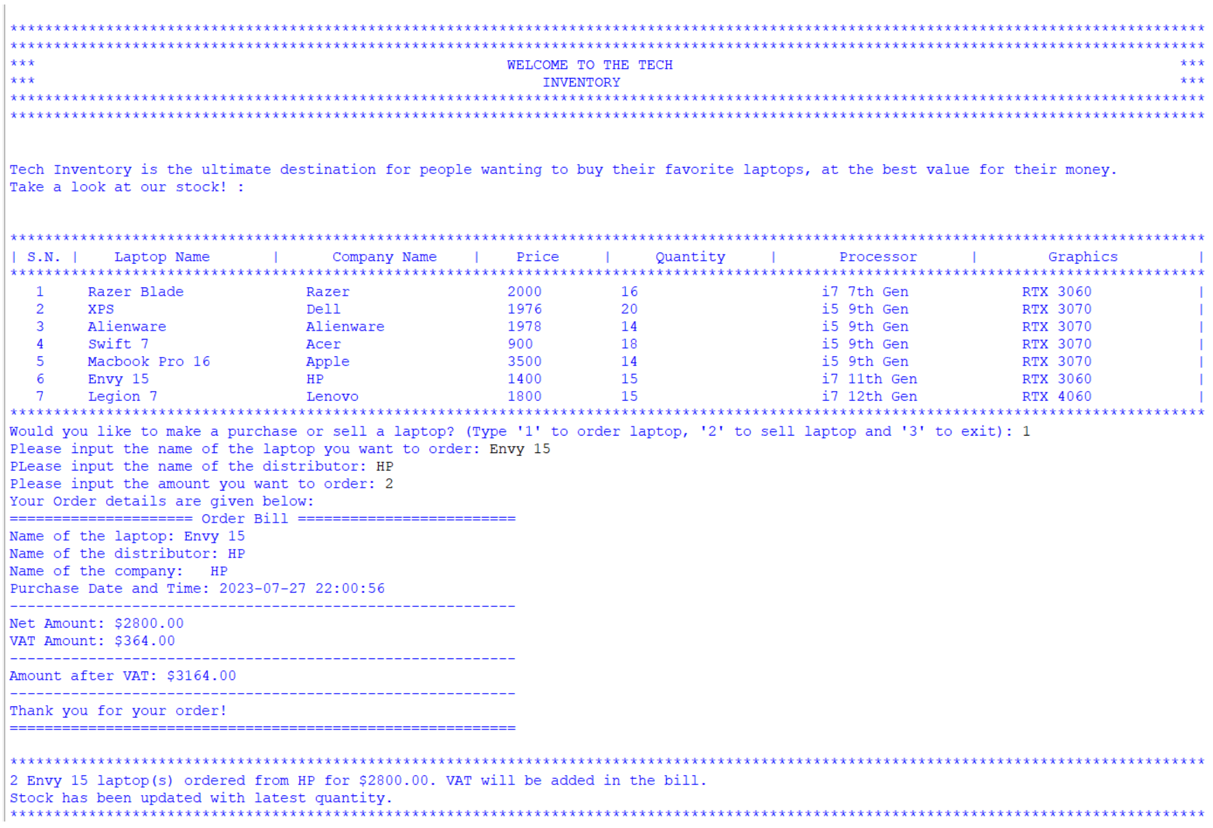
1. Order laptop: The user can input the name of laptop, distributor's name and quantity of laptops to order. The program makes calculations and adds VAT to find out amount after VAT which is then showed in the bill. The bill is generated once the transaction is completed and quantity in the stock is updated.

2. Sell laptop: The user can input the name to laptop they want to sell, along with quantity and customer's name. The program then checks if the quantity is enough, if there is, it calculated total amount including shipping cost. Here too, bill is generated and quantity is updated in the stock.

Basically the program keeps running until and unless the user decides to exit the program by entering '3'.

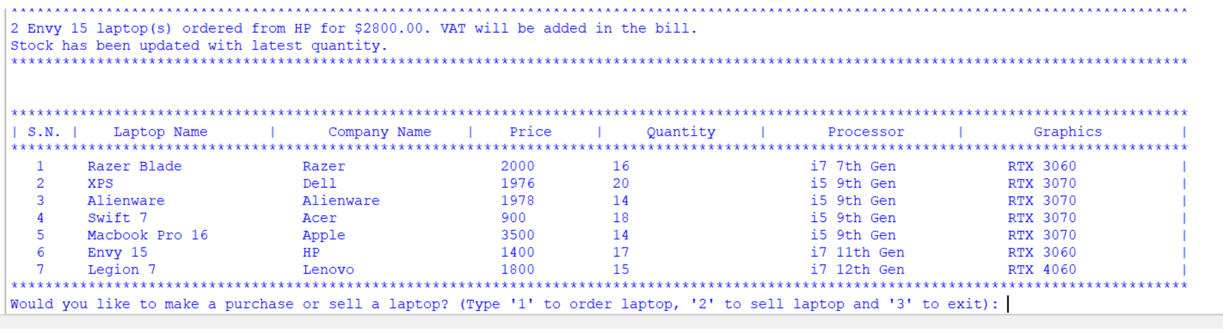
The program uses various functions to handle different tasks, such as reading data from the file, displaying the stock information, generating order/sales notes, handling user inputs, and updating the stock quantity. It also includes exception handling to deal with potential errors and provide informative error messages to the user.

PURCHASE AND SALE OF LAPTOP



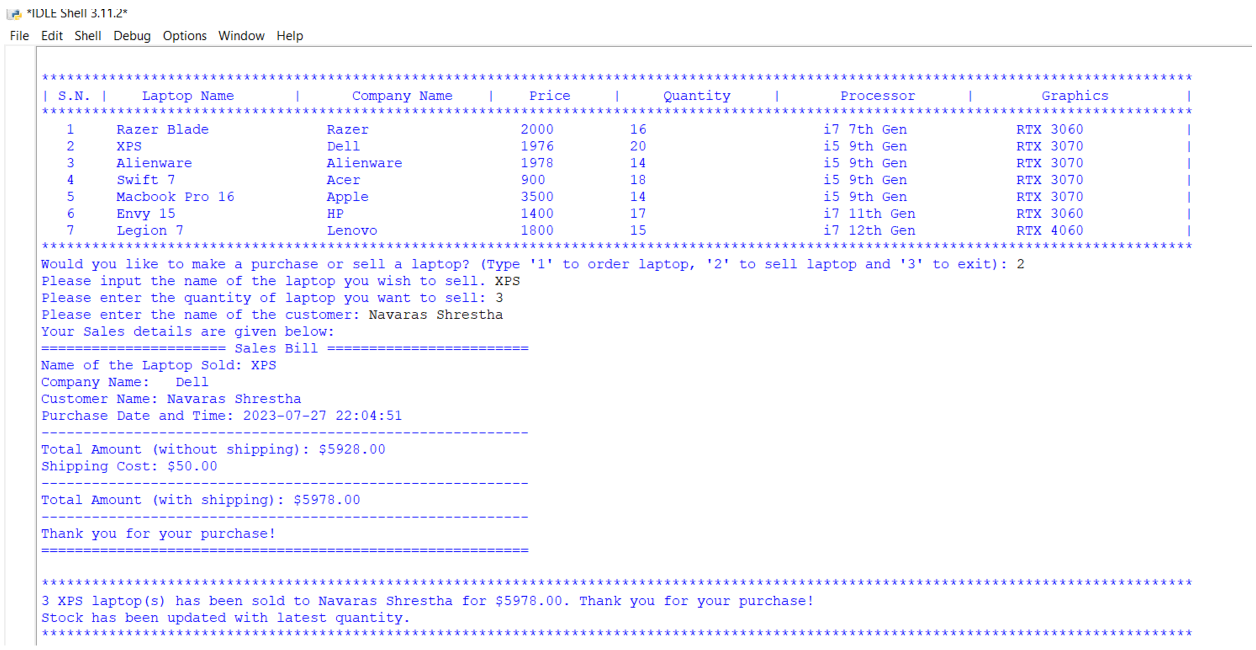
```
*******************************************************************************************************************************************
*******************************************************************************************************************************************
***                                                        WELCOME TO THE TECH                                                          ***
***                                                            INVENTORY                                                                ***
*******************************************************************************************************************************************
*******************************************************************************************************************************************


Tech Inventory is the ultimate destination for people wanting to buy their favorite laptops, at the best value for their money.
Take a look at our stock! :


*******************************************************************************************************************************************
| S.N. |    Laptop Name       |      Company Name     |    Price     |     Quantity     |       Processor       |       Graphics           |
*******************************************************************************************************************************************
   1     Razer Blade               Razer                  2000         16                     i7 7th Gen              RTX 3060                 |
   2     XPS                       Dell                   1976         20                     i5 9th Gen              RTX 3070                 |
   3     Alienware                 Alienware              1978         14                     i5 9th Gen              RTX 3070                 |
   4     Swift 7                   Acer                   900          18                     i5 9th Gen              RTX 3070                 |
   5     Macbook Pro 16            Apple                  3500         14                     i5 9th Gen              RTX 3070                 |
   6     Envy 15                   HP                     1400         15                     i7 11th Gen             RTX 3060                 |
   7     Legion 7                  Lenovo                 1800         15                     i7 12th Gen             RTX 4060                 |
*******************************************************************************************************************************************
Would you like to make a purchase or sell a laptop? (Type '1' to order laptop, '2' to sell laptop and '3' to exit): 1
Please input the name of the laptop you want to order: Envy 15
PLease input the name of the distributor: HP
Please input the amount you want to order: 2
Your Order details are given below:
==================== Order Bill ========================
Name of the laptop: Envy 15
Name of the distributor: HP
Name of the company:   HP
Purchase Date and Time: 2023-07-27 22:00:56
----------------------------------------------------------
Net Amount: $2800.00
VAT Amount: $364.00
----------------------------------------------------------
Amount after VAT: $3164.00
----------------------------------------------------------
Thank you for your order!
==========================================================

*******************************************************************************************************************************************
2 Envy 15 laptop(s) ordered from HP for $2800.00. VAT will be added in the bill.
Stock has been updated with latest quantity.
*******************************************************************************************************************************************
```

Figure 2: Process of ordering laptop



```
*******************************************************************************************************************************************
2 Envy 15 laptop(s) ordered from HP for $2800.00. VAT will be added in the bill.
Stock has been updated with latest quantity.
*******************************************************************************************************************************************


*******************************************************************************************************************************************
| S.N. |    Laptop Name       |      Company Name     |    Price     |     Quantity     |       Processor       |       Graphics           |
*******************************************************************************************************************************************
   1     Razer Blade               Razer                  2000         16                     i7 7th Gen              RTX 3060                 |
   2     XPS                       Dell                   1976         20                     i5 9th Gen              RTX 3070                 |
   3     Alienware                 Alienware              1978         14                     i5 9th Gen              RTX 3070                 |
   4     Swift 7                   Acer                   900          18                     i5 9th Gen              RTX 3070                 |
   5     Macbook Pro 16            Apple                  3500         14                     i5 9th Gen              RTX 3070                 |
   6     Envy 15                   HP                     1400         17                     i7 11th Gen             RTX 3060                 |
   7     Legion 7                  Lenovo                 1800         15                     i7 12th Gen             RTX 4060                 |
*******************************************************************************************************************************************
Would you like to make a purchase or sell a laptop? (Type '1' to order laptop, '2' to sell laptop and '3' to exit):
```

Figure 3: Updated quantity in the stock

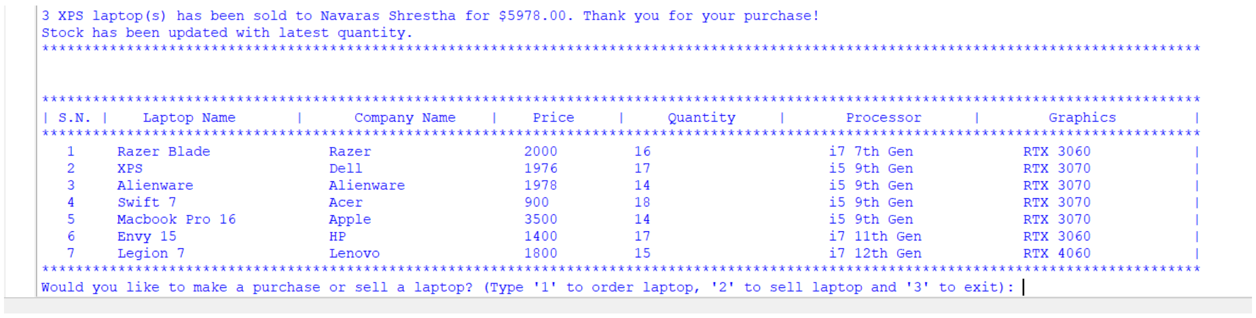


IDLE Shell 3.11.2

File Edit Shell Debug Options Window Help

```
*********************************************************************************************************************************************
| S.N. |    Laptop Name        |       Company Name     |     Price      |      Quantity      |        Processor       |         Graphics          |
*********************************************************************************************************************************************
   1     Razer Blade              Razer                  2000         16                       i7 7th Gen             RTX 3060                  |
   2     XPS                      Dell                   1976         20                       i5 9th Gen             RTX 3070                  |
   3     Alienware                Alienware              1978         14                       i5 9th Gen             RTX 3070                  |
   4     Swift 7                  Acer                   900          18                       i5 9th Gen             RTX 3070                  |
   5     Macbook Pro 16           Apple                  3500         14                       i5 9th Gen             RTX 3070                  |
   6     Envy 15                  HP                     1400         17                       i7 11th Gen            RTX 3060                  |
   7     Legion 7                 Lenovo                 1800         15                       i7 12th Gen            RTX 4060                  |
*********************************************************************************************************************************************
Would you like to make a purchase or sell a laptop? (Type '1' to order laptop, '2' to sell laptop and '3' to exit): 2
Please input the name of the laptop you wish to sell. XPS
Please enter the quantity of laptop you want to sell: 3
Please enter the name of the customer: Navaras Shrestha
Your Sales details are given below:
====================== Sales Bill ========================
Name of the Laptop Sold: XPS
Company Name:   Dell
Customer Name: Navaras Shrestha
Purchase Date and Time: 2023-07-27 22:04:51
----------------------------------------------------------
Total Amount (without shipping): $5928.00
Shipping Cost: $50.00
----------------------------------------------------------
Total Amount (with shipping): $5978.00
----------------------------------------------------------
Thank you for your purchase!
==========================================================

*********************************************************************************************************************************************
3 XPS laptop(s) has been sold to Navaras Shrestha for $5978.00. Thank you for your purchase!
Stock has been updated with latest quantity.
*********************************************************************************************************************************************
```

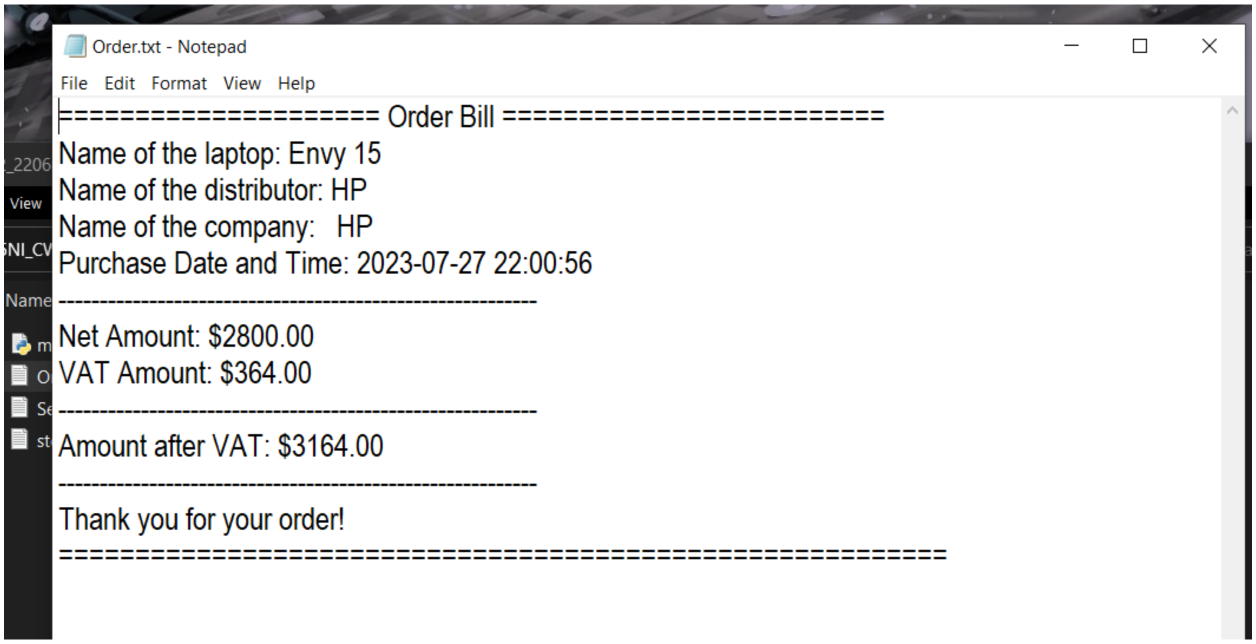
Figure 4: Sales process of laptop



```
3 XPS laptop(s) has been sold to Navaras Shrestha for $5978.00. Thank you for your purchase!
Stock has been updated with latest quantity.
*********************************************************************************************************************************************

*********************************************************************************************************************************************
| S.N. |    Laptop Name        |       Company Name     |     Price      |      Quantity      |        Processor       |         Graphics          |
*********************************************************************************************************************************************
   1     Razer Blade              Razer                  2000         16                       i7 7th Gen             RTX 3060                  |
   2     XPS                      Dell                   1976         17                       i5 9th Gen             RTX 3070                  |
   3     Alienware                Alienware              1978         14                       i5 9th Gen             RTX 3070                  |
   4     Swift 7                  Acer                   900          18                       i5 9th Gen             RTX 3070                  |
   5     Macbook Pro 16           Apple                  3500         14                       i5 9th Gen             RTX 3070                  |
   6     Envy 15                  HP                     1400         17                       i7 11th Gen            RTX 3060                  |
   7     Legion 7                 Lenovo                 1800         15                       i7 12th Gen            RTX 4060                  |
*********************************************************************************************************************************************
Would you like to make a purchase or sell a laptop? (Type '1' to order laptop, '2' to sell laptop and '3' to exit):
```

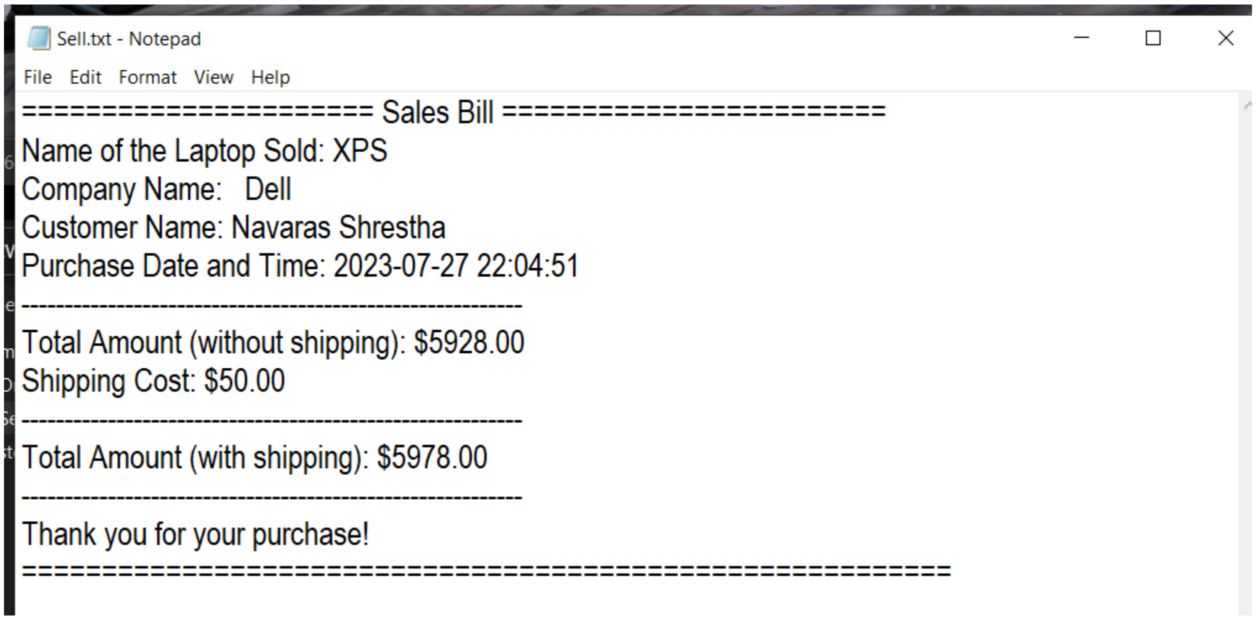
Figure 5: Updated quantity in the stock

CREATION OF TXT FILE WITH INVOICE/BILL



```
==================== Order Bill =========================
Name of the laptop: Envy 15
Name of the distributor: HP
Name of the company:   HP
Purchase Date and Time: 2023-07-27 22:00:56
------------------------------------------------------------
Net Amount: $2800.00
VAT Amount: $364.00
------------------------------------------------------------
Amount after VAT: $3164.00
------------------------------------------------------------
Thank you for your order!
============================================================
```

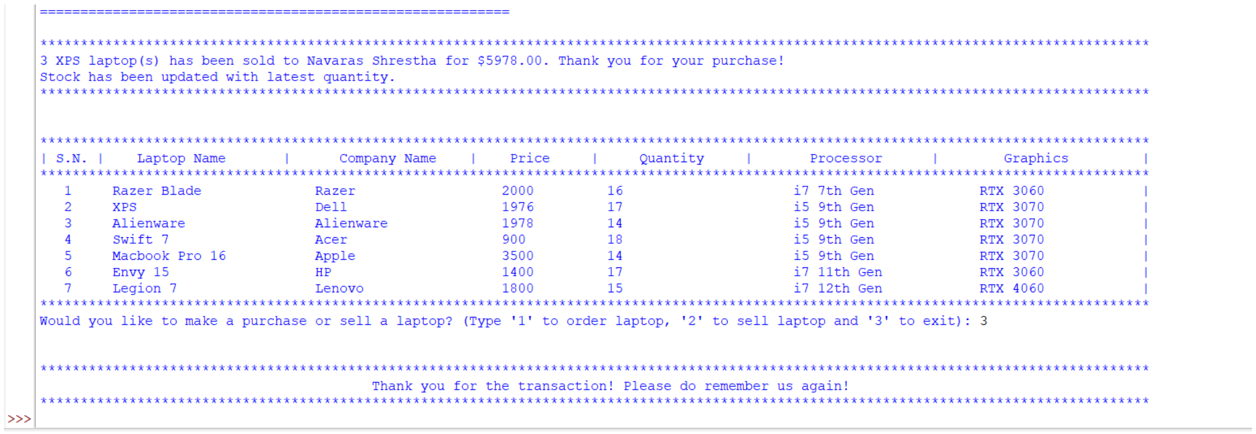
Figure 6: Order bill



```
====================== Sales Bill ========================
Name of the Laptop Sold: XPS
Company Name:   Dell
Customer Name: Navaras Shrestha
Purchase Date and Time: 2023-07-27 22:04:51
------------------------------------------------------------
Total Amount (without shipping): $5928.00
Shipping Cost: $50.00
------------------------------------------------------------
Total Amount (with shipping): $5978.00
------------------------------------------------------------
Thank you for your purchase!
============================================================
```

Figure 7: Sales bill

TERMINATION OF THE PROGRAM



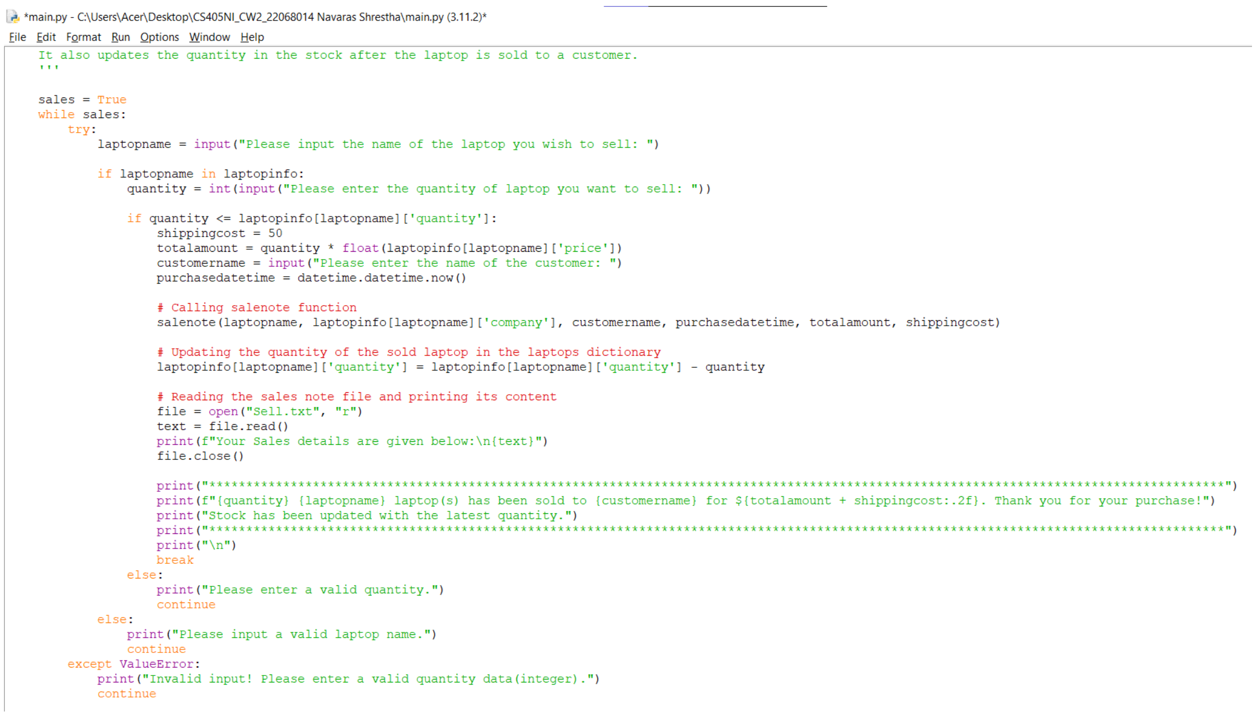
```
==========================================================

*****************************************************************************************************************************************
3 XPS laptop(s) has been sold to Navaras Shrestha for $5978.00. Thank you for your purchase!
Stock has been updated with latest quantity.
*****************************************************************************************************************************************


*****************************************************************************************************************************************
| S.N. |    Laptop Name       |      Company Name    |   Price     |     Quantity     |       Processor      |        Graphics         |
*****************************************************************************************************************************************
   1     Razer Blade              Razer                  2000         16                     i7 7th Gen             RTX 3060            |
   2     XPS                      Dell                   1976         17                     i5 9th Gen             RTX 3070            |
   3     Alienware                Alienware              1978         14                     i5 9th Gen             RTX 3070            |
   4     Swift 7                  Acer                   900          18                     i5 9th Gen             RTX 3070            |
   5     Macbook Pro 16           Apple                  3500         14                     i5 9th Gen             RTX 3070            |
   6     Envy 15                  HP                     1400         17                     i7 11th Gen            RTX 3060            |
   7     Legion 7                 Lenovo                 1800         15                     i7 12th Gen            RTX 4060            |
*****************************************************************************************************************************************
Would you like to make a purchase or sell a laptop? (Type '1' to order laptop, '2' to sell laptop and '3' to exit): 3


*****************************************************************************************************************************************
                                         Thank you for the transaction! Please do remember us again!
*****************************************************************************************************************************************
>>>
```

Figure 8: Program terminates after entering '3'

TESTING

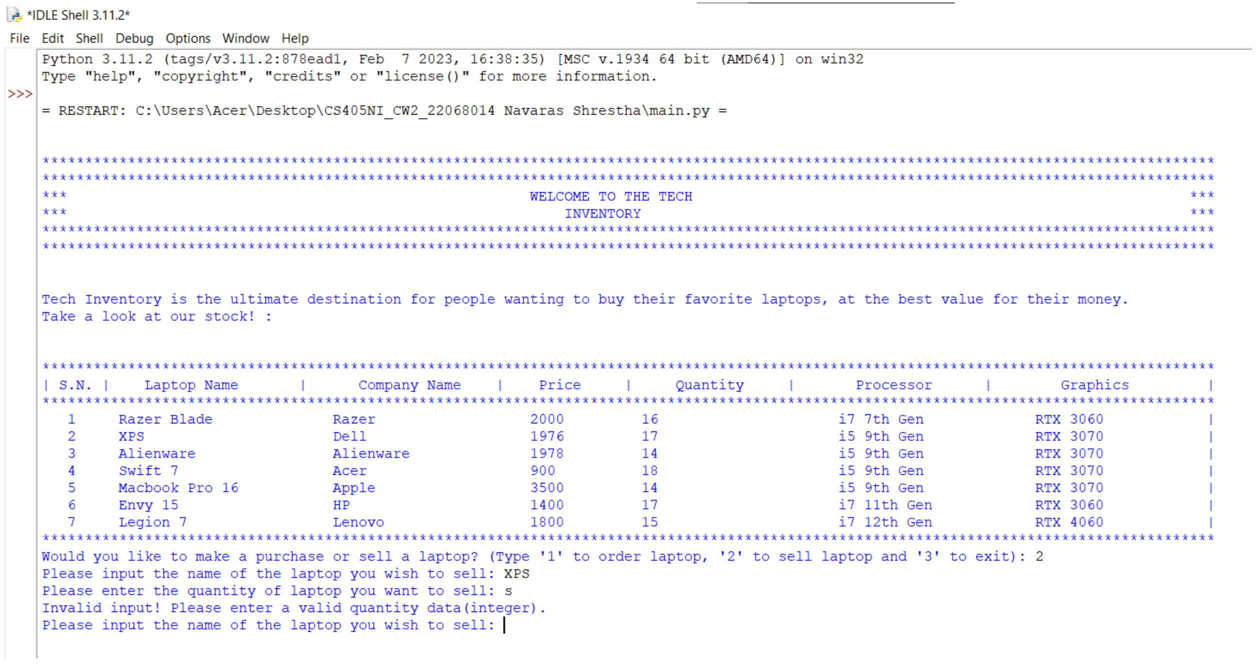
Test: 1

Objective	To show the implementation try and except.
Actions	• Open your program files using IDLE • Run “main.py” program file using IDLE • Enter an invalid input to check the implementation of try and except in the program
Expected result	Error msg is printed out.
Actual result	Error msg is printed out.
Conclusion	Test is a success.



```
    It also updates the quantity in the stock after the laptop is sold to a customer.
    '''

    sales = True
    while sales:
        try:
            laptopname = input("Please input the name of the laptop you wish to sell: ")

            if laptopname in laptopinfo:
                quantity = int(input("Please enter the quantity of laptop you want to sell: "))

                if quantity <= laptopinfo[laptopname]['quantity']:
                    shippingcost = 50
                    totalamount = quantity * float(laptopinfo[laptopname]['price'])
                    customername = input("Please enter the name of the customer: ")
                    purchasedatetime = datetime.datetime.now()

                    # Calling salenote function
                    salenote(laptopname, laptopinfo[laptopname]['company'], customername, purchasedatetime, totalamount, shippingcost)

                    # Updating the quantity of the sold laptop in the laptops dictionary
                    laptopinfo[laptopname]['quantity'] = laptopinfo[laptopname]['quantity'] - quantity

                    # Reading the sales note file and printing its content
                    file = open("Sell.txt", "r")
                    text = file.read()
                    print(f"Your Sales details are given below:\n{text}")
                    file.close()

                    print("*****************************************************************************************************************************************")
                    print(f"{quantity} {laptopname} laptop(s) has been sold to {customername} for ${totalamount + shippingcost:.2f}. Thank you for your purchase!")
                    print("Stock has been updated with the latest quantity.")
                    print("*****************************************************************************************************************************************")
                    print("\n")
                    break
                else:
                    print("Please enter a valid quantity.")
                    continue
            else:
                print("Please input a valid laptop name.")
                continue
        except ValueError:
            print("Invalid input! Please enter a valid quantity data(integer).")
            continue
```

Figure 9: try except in code

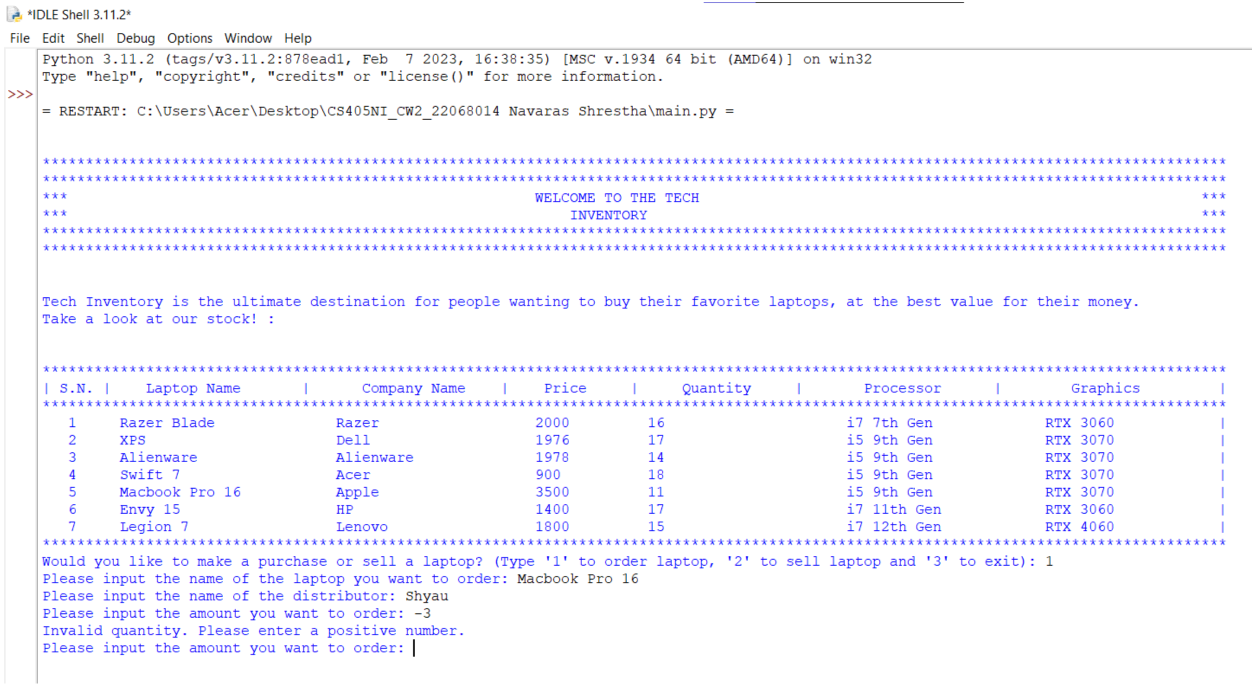


```
*IDLE Shell 3.11.2*
File  Edit  Shell  Debug  Options  Window  Help
Python 3.11.2 (tags/v3.11.2:878ead1, Feb  7 2023, 16:38:35) [MSC v.1934 64 bit (AMD64)] on win32
Type "help", "copyright", "credits" or "license()" for more information.
>>>
= RESTART: C:\Users\Acer\Desktop\CS405NI_CW2_22068014 Navaras Shrestha\main.py =


*********************************************************************************************************************************************
*********************************************************************************************************************************************
***                                                         WELCOME TO THE TECH                                                           ***
***                                                             INVENTORY                                                                 ***
*********************************************************************************************************************************************
*********************************************************************************************************************************************


Tech Inventory is the ultimate destination for people wanting to buy their favorite laptops, at the best value for their money.
Take a look at our stock! :


*********************************************************************************************************************************************
| S.N. |    Laptop Name       |      Company Name     |    Price     |     Quantity      |       Processor       |        Graphics          |
*********************************************************************************************************************************************
   1     Razer Blade               Razer                  2000         16                      i7 7th Gen              RTX 3060                 |
   2     XPS                       Dell                   1976         17                      i5 9th Gen              RTX 3070                 |
   3     Alienware                 Alienware              1978         14                      i5 9th Gen              RTX 3070                 |
   4     Swift 7                   Acer                   900          18                      i5 9th Gen              RTX 3070                 |
   5     Macbook Pro 16            Apple                  3500         14                      i5 9th Gen              RTX 3070                 |
   6     Envy 15                   HP                     1400         17                      i7 11th Gen             RTX 3060                 |
   7     Legion 7                  Lenovo                 1800         15                      i7 12th Gen             RTX 4060                 |
*********************************************************************************************************************************************
Would you like to make a purchase or sell a laptop? (Type '1' to order laptop, '2' to sell laptop and '3' to exit): 2
Please input the name of the laptop you wish to sell: XPS
Please enter the quantity of laptop you want to sell: s
Invalid input! Please enter a valid quantity data(integer).
Please input the name of the laptop you wish to sell: |
```

Figure 10: Invalid input shown in shell using exception handling

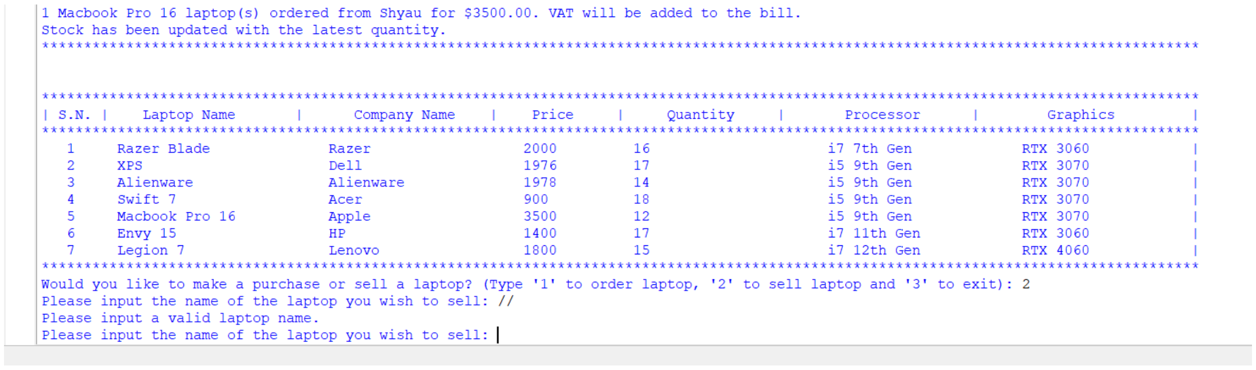
Test: 2

Objective	To show the selection buying and selling of laptop
Actions	• Open your program files using IDLE • Run “main.py” program file using IDLE • Enter an invalid input to check if the program can identify it
Expected result	Invalid input is identified and transaction is carried out successfully
Actual result	Invalid input is identified and transaction is carried out successfully
Conclusion	Test is a success.



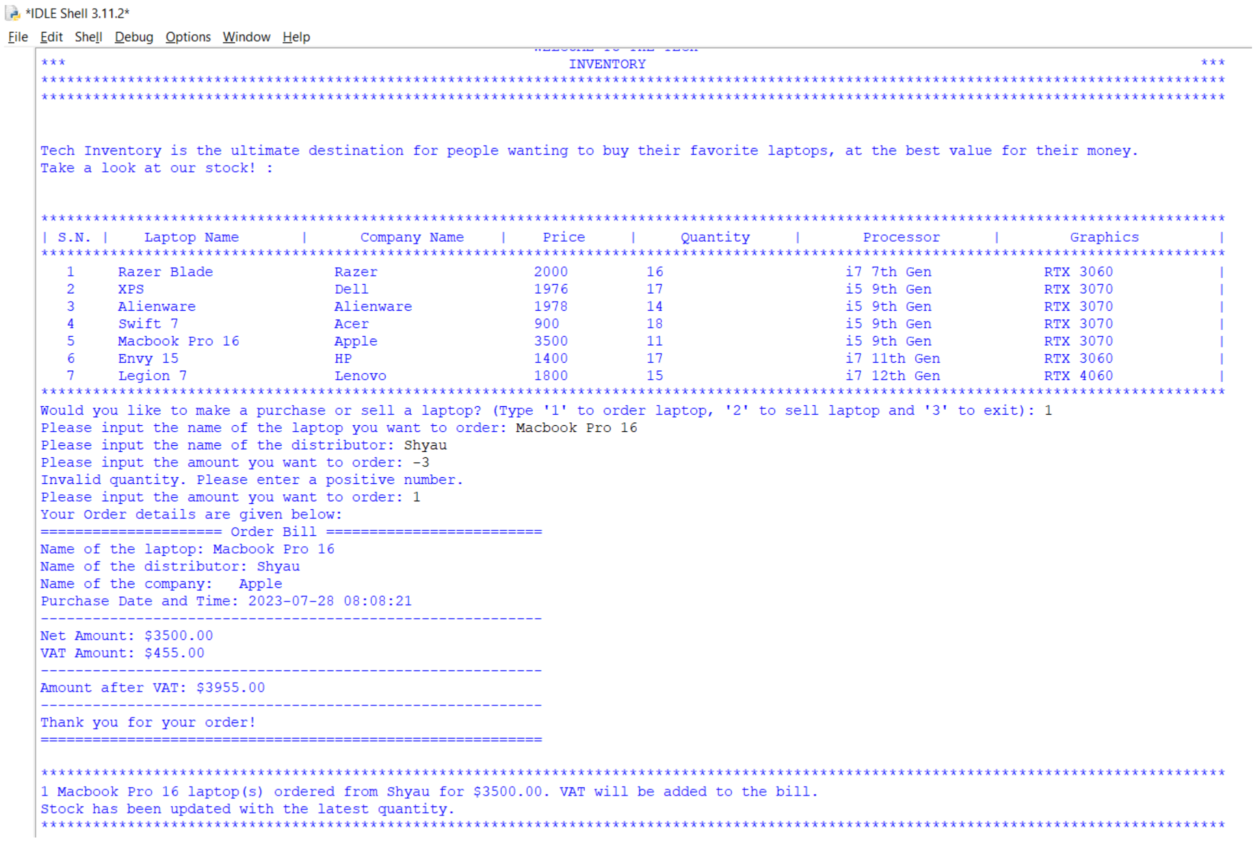
```
Python 3.11.2 (tags/v3.11.2:878ead1, Feb  7 2023, 16:38:35) [MSC v.1934 64 bit (AMD64)] on win32
Type "help", "copyright", "credits" or "license()" for more information.
>>>
= RESTART: C:\Users\Acer\Desktop\CS405NI_CW2_22068014 Navaras Shrestha\main.py =


********************************************************************************************************************************************
********************************************************************************************************************************************
***                                                        WELCOME TO THE TECH                                                          ***
***                                                            INVENTORY                                                                ***
********************************************************************************************************************************************
********************************************************************************************************************************************


Tech Inventory is the ultimate destination for people wanting to buy their favorite laptops, at the best value for their money.
Take a look at our stock! :

********************************************************************************************************************************************
| S.N. |     Laptop Name        |       Company Name      |     Price      |      Quantity       |        Processor        |         Graphics          |
********************************************************************************************************************************************
   1     Razer Blade               Razer                      2000          16                        i7 7th Gen                RTX 3060         |
   2     XPS                       Dell                       1976          17                        i5 9th Gen                RTX 3070         |
   3     Alienware                 Alienware                  1978          14                        i5 9th Gen                RTX 3070         |
   4     Swift 7                   Acer                       900           18                        i5 9th Gen                RTX 3070         |
   5     Macbook Pro 16            Apple                      3500          11                        i5 9th Gen                RTX 3070         |
   6     Envy 15                   HP                         1400          17                        i7 11th Gen               RTX 3060         |
   7     Legion 7                  Lenovo                     1800          15                        i7 12th Gen               RTX 4060         |
********************************************************************************************************************************************
Would you like to make a purchase or sell a laptop? (Type '1' to order laptop, '2' to sell laptop and '3' to exit): 1
Please input the name of the laptop you want to order: Macbook Pro 16
Please input the name of the distributor: Shyau
Please input the amount you want to order: -3
Invalid quantity. Please enter a positive number.
Please input the amount you want to order: 
```

Figure 11: Providing negative value as input



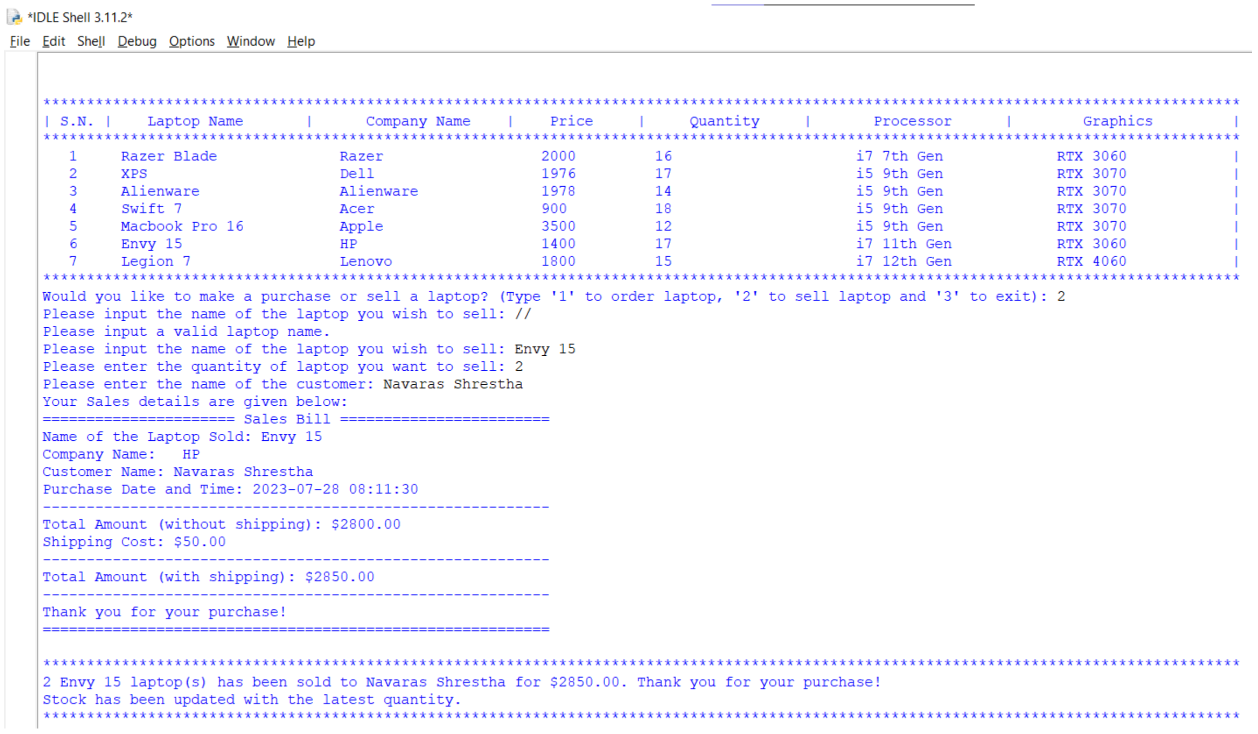
```
1 Macbook Pro 16 laptop(s) ordered from Shyau for $3500.00. VAT will be added to the bill.
Stock has been updated with the latest quantity.
********************************************************************************************************************************************


********************************************************************************************************************************************
| S.N. |     Laptop Name        |       Company Name      |     Price      |      Quantity       |        Processor        |         Graphics          |
********************************************************************************************************************************************
   1     Razer Blade               Razer                      2000          16                        i7 7th Gen                RTX 3060         |
   2     XPS                       Dell                       1976          17                        i5 9th Gen                RTX 3070         |
   3     Alienware                 Alienware                  1978          14                        i5 9th Gen                RTX 3070         |
   4     Swift 7                   Acer                       900           18                        i5 9th Gen                RTX 3070         |
   5     Macbook Pro 16            Apple                      3500          12                        i5 9th Gen                RTX 3070         |
   6     Envy 15                   HP                         1400          17                        i7 11th Gen               RTX 3060         |
   7     Legion 7                  Lenovo                     1800          15                        i7 12th Gen               RTX 4060         |
********************************************************************************************************************************************
Would you like to make a purchase or sell a laptop? (Type '1' to order laptop, '2' to sell laptop and '3' to exit): 2
Please input the name of the laptop you wish to sell: //
Please input a valid laptop name.
Please input the name of the laptop you wish to sell: 
```

Figure 12: Providing non existing value as input



```
***                                                          INVENTORY                                                                ***
*****************************************************************************************************************************************
*****************************************************************************************************************************************


Tech Inventory is the ultimate destination for people wanting to buy their favorite laptops, at the best value for their money.
Take a look at our stock! :


*****************************************************************************************************************************************
| S.N. |    Laptop Name       |      Company Name    |    Price     |     Quantity     |       Processor      |        Graphics         |
*****************************************************************************************************************************************
   1     Razer Blade              Razer                  2000         16                    i7 7th Gen             RTX 3060            |
   2     XPS                      Dell                   1976         17                    i5 9th Gen             RTX 3070            |
   3     Alienware                Alienware              1978         14                    i5 9th Gen             RTX 3070            |
   4     Swift 7                  Acer                   900          18                    i5 9th Gen             RTX 3070            |
   5     Macbook Pro 16           Apple                  3500         11                    i5 9th Gen             RTX 3070            |
   6     Envy 15                  HP                     1400         17                    i7 11th Gen            RTX 3060            |
   7     Legion 7                 Lenovo                 1800         15                    i7 12th Gen            RTX 4060            |
*****************************************************************************************************************************************
Would you like to make a purchase or sell a laptop? (Type '1' to order laptop, '2' to sell laptop and '3' to exit): 1
Please input the name of the laptop you want to order: Macbook Pro 16
Please input the name of the distributor: Shyau
Please input the amount you want to order: -3
Invalid quantity. Please enter a positive number.
Please input the amount you want to order: 1
Your Order details are given below:
===================== Order Bill =========================
Name of the laptop: Macbook Pro 16
Name of the distributor: Shyau
Name of the company:   Apple
Purchase Date and Time: 2023-07-28 08:08:21
----------------------------------------------------------
Net Amount: $3500.00
VAT Amount: $455.00
----------------------------------------------------------
Amount after VAT: $3955.00
----------------------------------------------------------
Thank you for your order!
==========================================================

*****************************************************************************************************************************************
1 Macbook Pro 16 laptop(s) ordered from Shyau for $3500.00. VAT will be added to the bill.
Stock has been updated with the latest quantity.
*****************************************************************************************************************************************
```

Figure 13: Laptop bought successfully

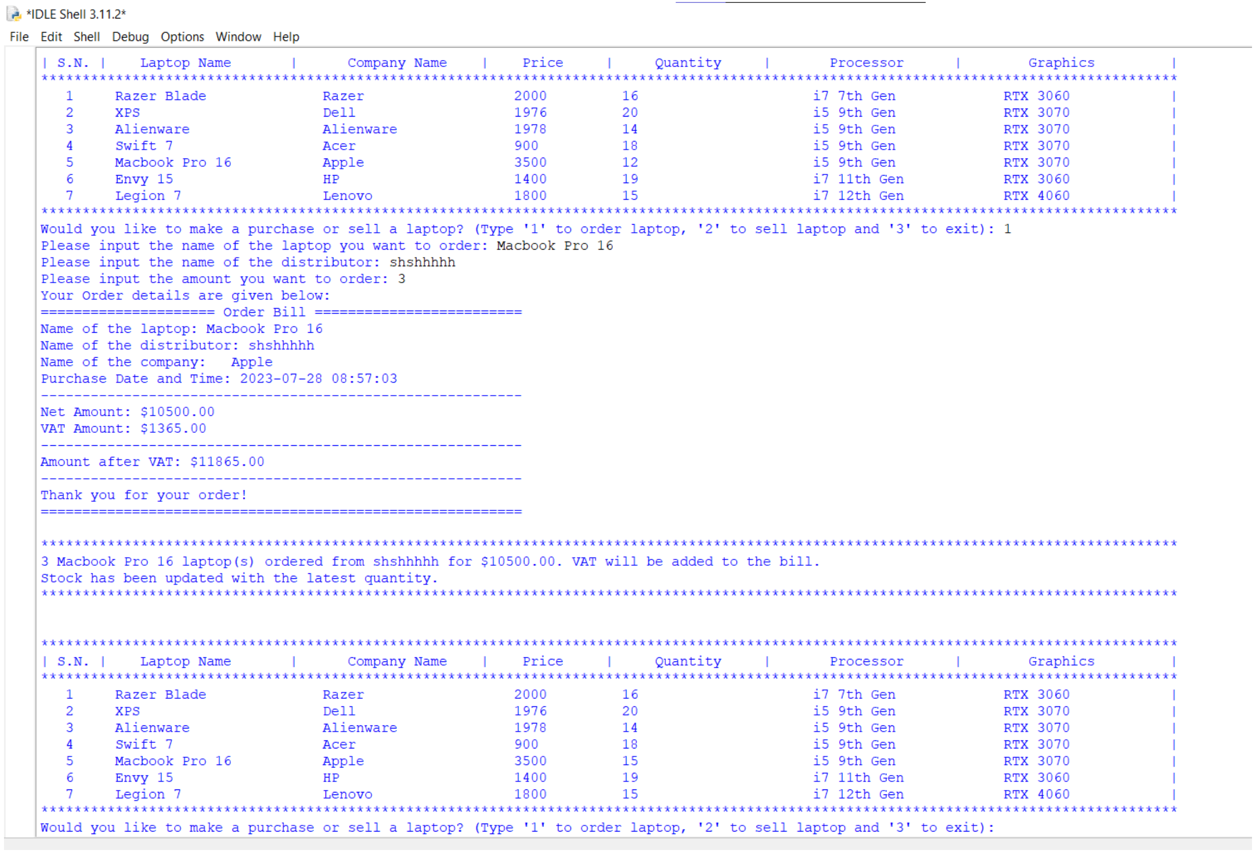


```
*****************************************************************************************************************************************
| S.N. |    Laptop Name       |      Company Name    |    Price     |     Quantity     |       Processor      |        Graphics         |
*****************************************************************************************************************************************
   1     Razer Blade              Razer                  2000         16                     i7 7th Gen             RTX 3060            |
   2     XPS                      Dell                   1976         17                     i5 9th Gen             RTX 3070            |
   3     Alienware                Alienware              1978         14                     i5 9th Gen             RTX 3070            |
   4     Swift 7                  Acer                   900          18                     i5 9th Gen             RTX 3070            |
   5     Macbook Pro 16           Apple                  3500         12                     i5 9th Gen             RTX 3070            |
   6     Envy 15                  HP                     1400         17                     i7 11th Gen            RTX 3060            |
   7     Legion 7                 Lenovo                 1800         15                     i7 12th Gen            RTX 4060            |
*****************************************************************************************************************************************
Would you like to make a purchase or sell a laptop? (Type '1' to order laptop, '2' to sell laptop and '3' to exit): 2
Please input the name of the laptop you wish to sell: //
Please input a valid laptop name.
Please input the name of the laptop you wish to sell: Envy 15
Please enter the quantity of laptop you want to sell: 2
Please enter the name of the customer: Navaras Shrestha
Your Sales details are given below:
====================== Sales Bill ========================
Name of the Laptop Sold: Envy 15
Company Name:   HP
Customer Name: Navaras Shrestha
Purchase Date and Time: 2023-07-28 08:11:30
----------------------------------------------------------
Total Amount (without shipping): $2800.00
Shipping Cost: $50.00
----------------------------------------------------------
Total Amount (with shipping): $2850.00
----------------------------------------------------------
Thank you for your purchase!
==========================================================

*****************************************************************************************************************************************
2 Envy 15 laptop(s) has been sold to Navaras Shrestha for $2850.00. Thank you for your purchase!
Stock has been updated with the latest quantity.
*****************************************************************************************************************************************
```

Figure 14: Laptop sold successfully

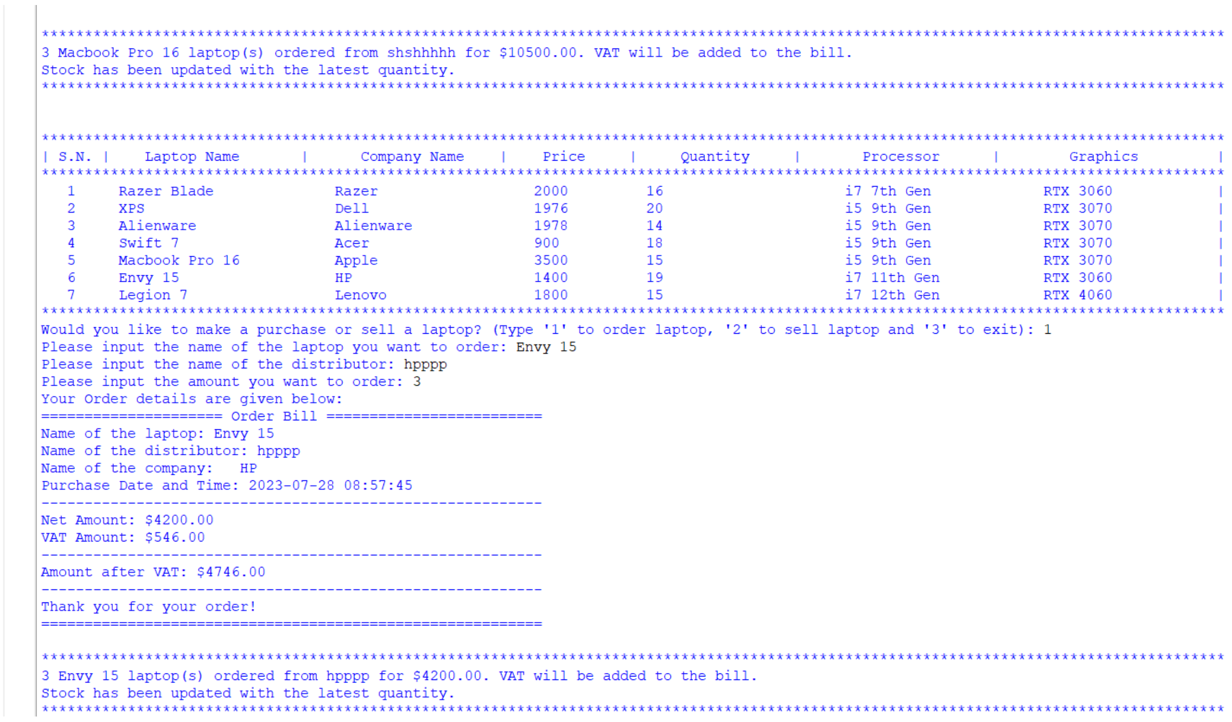
Test: 3

Objective	To show file generation on multiple purchases of laptops
Actions	• Open your program files using IDLE • Run “main.py” program file using IDLE • Complete buying process, and when asked if you want to buy again, input yes and show bill
Expected result	To be able to buy multiple times
Actual result	Able to buy multiple times with bill
Conclusion	Test is a success.



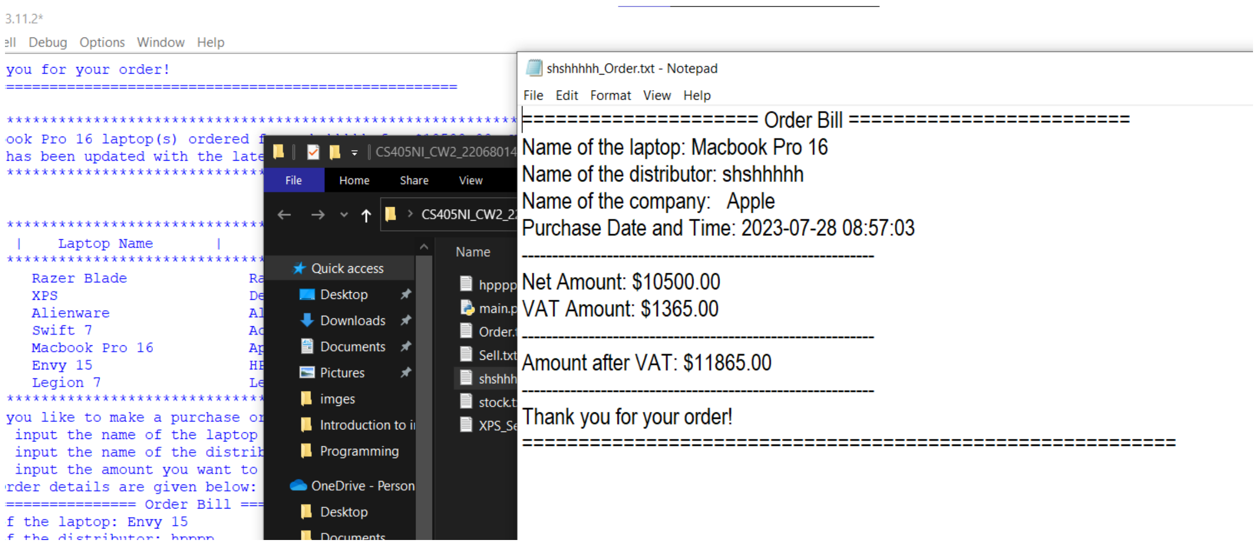
```
| S.N. |    Laptop Name       |      Company Name    |    Price     |     Quantity     |       Processor       |        Graphics         |
*************************************************************************************************************************************
   1     Razer Blade               Razer                 2000         16                       i7 7th Gen              RTX 3060           |
   2     XPS                       Dell                  1976         20                       i5 9th Gen              RTX 3070           |
   3     Alienware                 Alienware             1978         14                       i5 9th Gen              RTX 3070           |
   4     Swift 7                   Acer                  900          18                       i5 9th Gen              RTX 3070           |
   5     Macbook Pro 16            Apple                 3500         12                       i5 9th Gen              RTX 3070           |
   6     Envy 15                   HP                    1400         19                       i7 11th Gen             RTX 3060           |
   7     Legion 7                  Lenovo                1800         15                       i7 12th Gen             RTX 4060           |
*************************************************************************************************************************************
Would you like to make a purchase or sell a laptop? (Type '1' to order laptop, '2' to sell laptop and '3' to exit): 1
Please input the name of the laptop you want to order: Macbook Pro 16
Please input the name of the distributor: shshhhhh
Please input the amount you want to order: 3
Your Order details are given below:
===================== Order Bill ==========================
Name of the laptop: Macbook Pro 16
Name of the distributor: shshhhhh
Name of the company:   Apple
Purchase Date and Time: 2023-07-28 08:57:03
-----------------------------------------------------------
Net Amount: $10500.00
VAT Amount: $1365.00
-----------------------------------------------------------
Amount after VAT: $11865.00
-----------------------------------------------------------
Thank you for your order!
===========================================================

*************************************************************************************************************************************
3 Macbook Pro 16 laptop(s) ordered from shshhhhh for $10500.00. VAT will be added to the bill.
Stock has been updated with the latest quantity.
*************************************************************************************************************************************


*************************************************************************************************************************************
| S.N. |    Laptop Name       |      Company Name    |    Price     |     Quantity     |       Processor       |        Graphics         |
*************************************************************************************************************************************
   1     Razer Blade               Razer                 2000         16                       i7 7th Gen              RTX 3060           |
   2     XPS                       Dell                  1976         20                       i5 9th Gen              RTX 3070           |
   3     Alienware                 Alienware             1978         14                       i5 9th Gen              RTX 3070           |
   4     Swift 7                   Acer                  900          18                       i5 9th Gen              RTX 3070           |
   5     Macbook Pro 16            Apple                 3500         15                       i5 9th Gen              RTX 3070           |
   6     Envy 15                   HP                    1400         19                       i7 11th Gen             RTX 3060           |
   7     Legion 7                  Lenovo                1800         15                       i7 12th Gen             RTX 4060           |
*************************************************************************************************************************************
Would you like to make a purchase or sell a laptop? (Type '1' to order laptop, '2' to sell laptop and '3' to exit):
```

Figure 15: first purchase



```
**********************************************************************************************************************************************
3 Macbook Pro 16 laptop(s) ordered from shshhhhh for $10500.00. VAT will be added to the bill.
Stock has been updated with the latest quantity.
**********************************************************************************************************************************************


**********************************************************************************************************************************************
| S.N. |    Laptop Name       |       Company Name     |     Price     |      Quantity     |        Processor       |         Graphics        |
**********************************************************************************************************************************************
   1     Razer Blade              Razer                   2000          16                   i7 7th Gen            RTX 3060               |
   2     XPS                      Dell                    1976          20                   i5 9th Gen            RTX 3070               |
   3     Alienware                Alienware               1978          14                   i5 9th Gen            RTX 3070               |
   4     Swift 7                  Acer                    900           18                   i5 9th Gen            RTX 3070               |
   5     Macbook Pro 16           Apple                   3500          15                   i5 9th Gen            RTX 3070               |
   6     Envy 15                  HP                      1400          19                   i7 11th Gen           RTX 3060               |
   7     Legion 7                 Lenovo                  1800          15                   i7 12th Gen           RTX 4060               |
**********************************************************************************************************************************************
Would you like to make a purchase or sell a laptop? (Type '1' to order laptop, '2' to sell laptop and '3' to exit): 1
Please input the name of the laptop you want to order: Envy 15
Please input the name of the distributor: hpppp
Please input the amount you want to order: 3
Your Order details are given below:
===================== Order Bill ==========================
Name of the laptop: Envy 15
Name of the distributor: hpppp
Name of the company:   HP
Purchase Date and Time: 2023-07-28 08:57:45
-----------------------------------------------------------
Net Amount: $4200.00
VAT Amount: $546.00
-----------------------------------------------------------
Amount after VAT: $4746.00
-----------------------------------------------------------
Thank you for your order!
===========================================================

**********************************************************************************************************************************************
3 Envy 15 laptop(s) ordered from hpppp for $4200.00. VAT will be added to the bill.
Stock has been updated with the latest quantity.
**********************************************************************************************************************************************
```

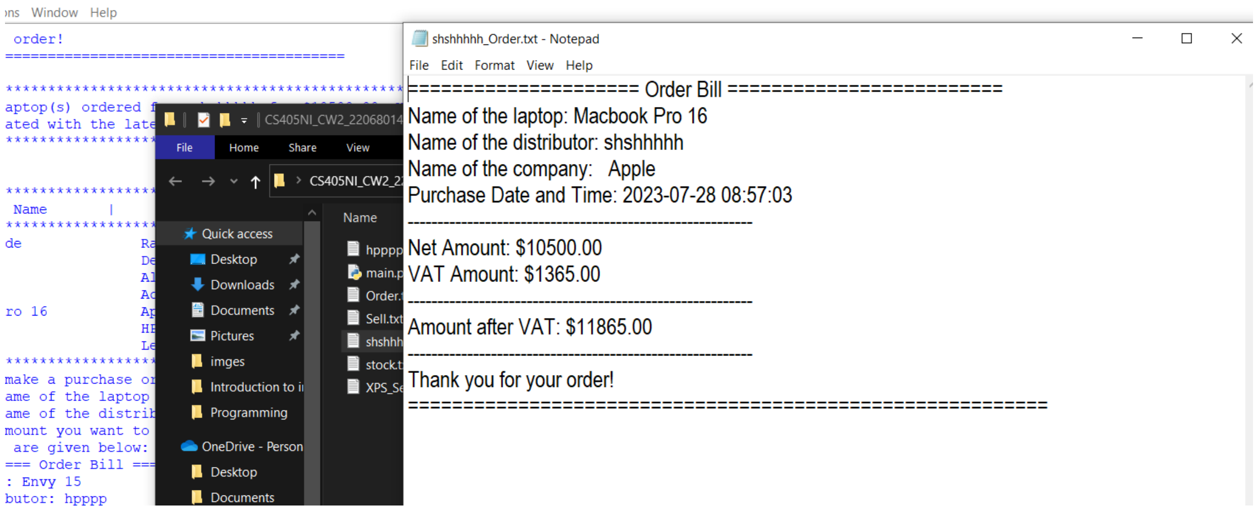
Figure 16 second purchase



```
you for your order!
=====================================================
ook Pro 16 laptop(s) ordered f
has been updated with the late
  |    Laptop Name       |
   Razer Blade              Ra
   XPS                      De
   Alienware                Al
   Swift 7                  Ac
   Macbook Pro 16           Ap
   Envy 15                  HP
   Legion 7                 Le
you like to make a purchase or
 input the name of the laptop
 input the name of the distrib
 input the amount you want to
rder details are given below:
=============== Order Bill ===
f the laptop: Envy 15
```

```
===================== Order Bill ==========================
Name of the laptop: Macbook Pro 16
Name of the distributor: shshhhhh
Name of the company:   Apple
Purchase Date and Time: 2023-07-28 08:57:03
-----------------------------------------------------------
Net Amount: $10500.00
VAT Amount: $1365.00
-----------------------------------------------------------
Amount after VAT: $11865.00
-----------------------------------------------------------
Thank you for your order!
===========================================================
```

Figure 17 First purchase bill

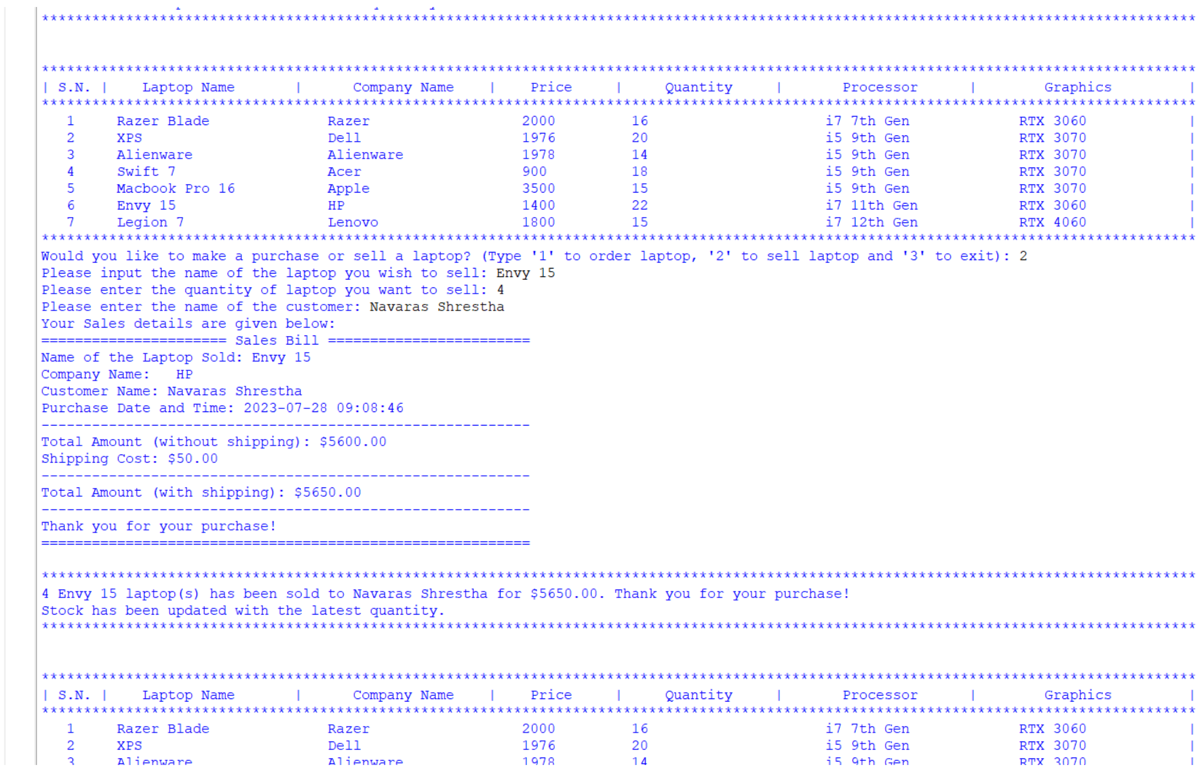


```
==================== Order Bill ========================
Name of the laptop: Macbook Pro 16
Name of the distributor: shshhhhh
Name of the company:   Apple
Purchase Date and Time: 2023-07-28 08:57:03
------------------------------------------------------
Net Amount: $10500.00
VAT Amount: $1365.00
------------------------------------------------------
Amount after VAT: $11865.00
------------------------------------------------------
Thank you for your order!
============================================================
```

Figure 18: Second order bill

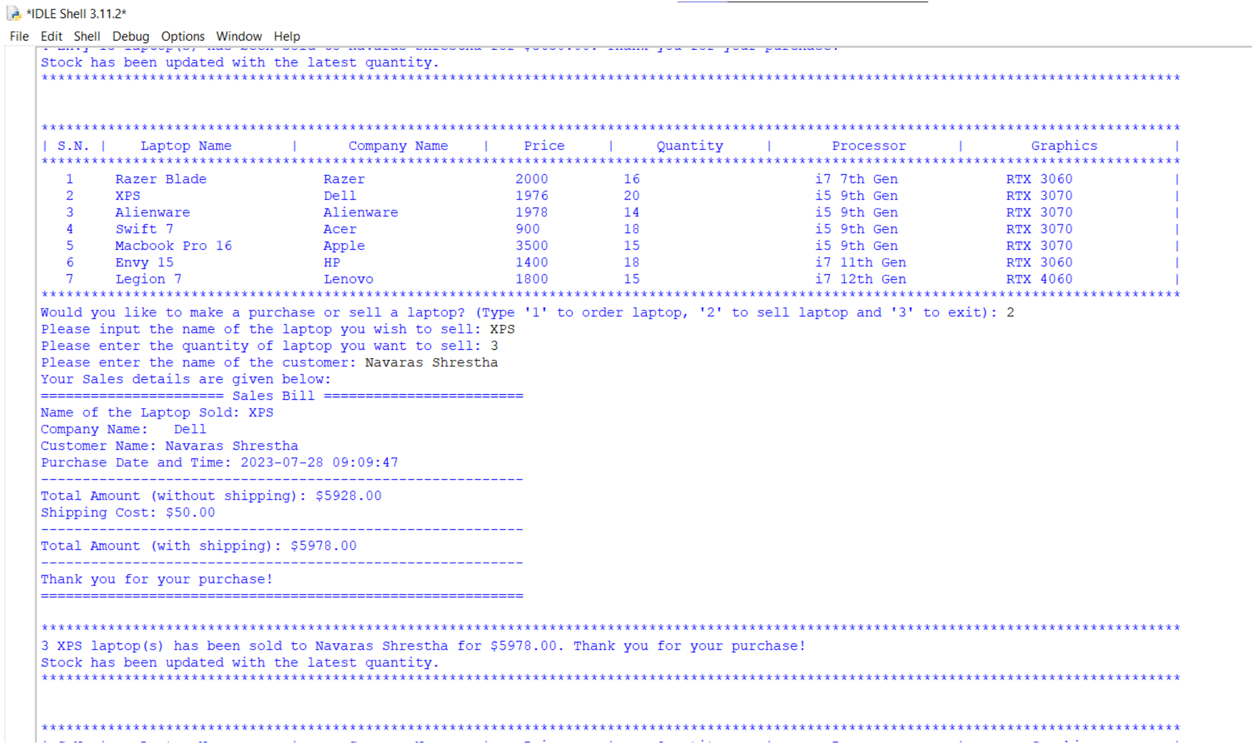
Test: 4

Objective	To show file generation on multiple sales of laptops
Actions	• Open your program files using IDLE • Run “main.py” program file using IDLE • Complete selling process, and when asked if you want to sell again, input yes and show bill
Expected result	To be able sell multiple times
Actual result	Able to sell multiple times with bill
Conclusion	Test is a success.



```
*********************************************************************************************************************************************


*********************************************************************************************************************************************
| S.N. |    Laptop Name       |      Company Name     |    Price      |     Quantity      |        Processor        |        Graphics         |
*********************************************************************************************************************************************
   1     Razer Blade              Razer                  2000         16                        i7 7th Gen              RTX 3060            |
   2     XPS                      Dell                   1976         20                        i5 9th Gen              RTX 3070            |
   3     Alienware                Alienware              1978         14                        i5 9th Gen              RTX 3070            |
   4     Swift 7                  Acer                   900          18                        i5 9th Gen              RTX 3070            |
   5     Macbook Pro 16           Apple                  3500         15                        i5 9th Gen              RTX 3070            |
   6     Envy 15                  HP                     1400         22                        i7 11th Gen             RTX 3060            |
   7     Legion 7                 Lenovo                 1800         15                        i7 12th Gen             RTX 4060            |
*********************************************************************************************************************************************
Would you like to make a purchase or sell a laptop? (Type '1' to order laptop, '2' to sell laptop and '3' to exit): 2
Please input the name of the laptop you wish to sell: Envy 15
Please enter the quantity of laptop you want to sell: 4
Please enter the name of the customer: Navaras Shrestha
Your Sales details are given below:
===================== Sales Bill ========================
Name of the Laptop Sold: Envy 15
Company Name:   HP
Customer Name: Navaras Shrestha
Purchase Date and Time: 2023-07-28 09:08:46
----------------------------------------------------------
Total Amount (without shipping): $5600.00
Shipping Cost: $50.00
----------------------------------------------------------
Total Amount (with shipping): $5650.00
----------------------------------------------------------
Thank you for your purchase!
==========================================================

*********************************************************************************************************************************************
4 Envy 15 laptop(s) has been sold to Navaras Shrestha for $5650.00. Thank you for your purchase!
Stock has been updated with the latest quantity.
*********************************************************************************************************************************************


*********************************************************************************************************************************************
| S.N. |    Laptop Name       |      Company Name     |    Price      |     Quantity      |        Processor        |        Graphics         |
*********************************************************************************************************************************************
   1     Razer Blade              Razer                  2000         16                        i7 7th Gen              RTX 3060            |
   2     XPS                      Dell                   1976         20                        i5 9th Gen              RTX 3070            |
   3     Alienware                Alienware              1978         14                        i5 9th Gen              RTX 3070            |
```

Figure 19: First sale of laptop

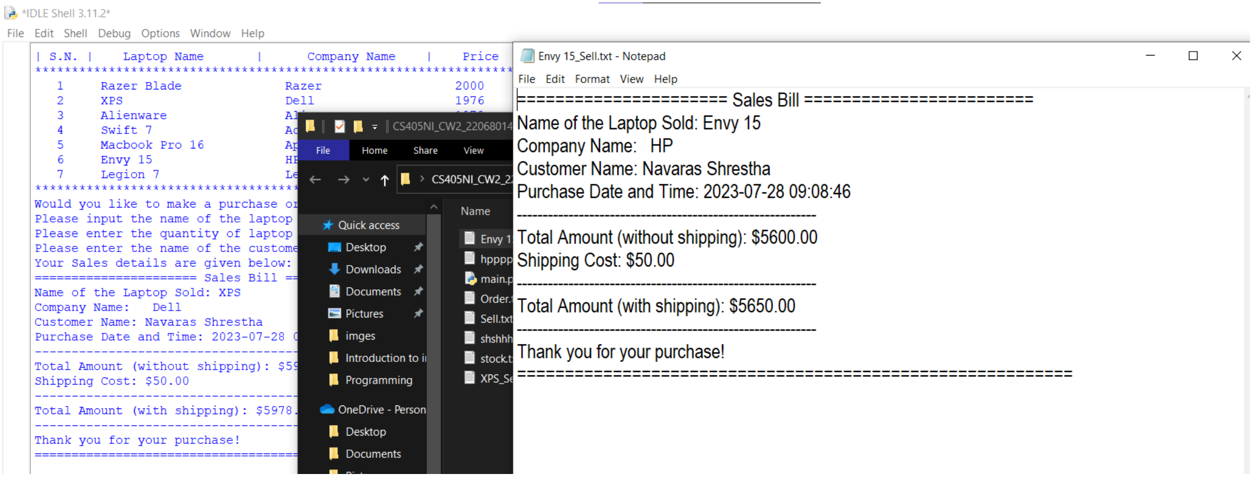


IDLE Shell 3.11.2

File Edit Shell Debug Options Window Help

```
Stock has been updated with the latest quantity.
*********************************************************************************************************************************************


*********************************************************************************************************************************************
| S.N. |    Laptop Name       |      Company Name     |    Price      |     Quantity      |        Processor        |        Graphics         |
*********************************************************************************************************************************************
   1     Razer Blade              Razer                  2000         16                        i7 7th Gen              RTX 3060            |
   2     XPS                      Dell                   1976         20                        i5 9th Gen              RTX 3070            |
   3     Alienware                Alienware              1978         14                        i5 9th Gen              RTX 3070            |
   4     Swift 7                  Acer                   900          18                        i5 9th Gen              RTX 3070            |
   5     Macbook Pro 16           Apple                  3500         15                        i5 9th Gen              RTX 3070            |
   6     Envy 15                  HP                     1400         18                        i7 11th Gen             RTX 3060            |
   7     Legion 7                 Lenovo                 1800         15                        i7 12th Gen             RTX 4060            |
*********************************************************************************************************************************************
Would you like to make a purchase or sell a laptop? (Type '1' to order laptop, '2' to sell laptop and '3' to exit): 2
Please input the name of the laptop you wish to sell: XPS
Please enter the quantity of laptop you want to sell: 3
Please enter the name of the customer: Navaras Shrestha
Your Sales details are given below:
===================== Sales Bill ========================
Name of the Laptop Sold: XPS
Company Name:   Dell
Customer Name: Navaras Shrestha
Purchase Date and Time: 2023-07-28 09:09:47
----------------------------------------------------------
Total Amount (without shipping): $5928.00
Shipping Cost: $50.00
----------------------------------------------------------
Total Amount (with shipping): $5978.00
----------------------------------------------------------
Thank you for your purchase!
==========================================================

*********************************************************************************************************************************************
3 XPS laptop(s) has been sold to Navaras Shrestha for $5978.00. Thank you for your purchase!
Stock has been updated with the latest quantity.
*********************************************************************************************************************************************


*********************************************************************************************************************************************
```

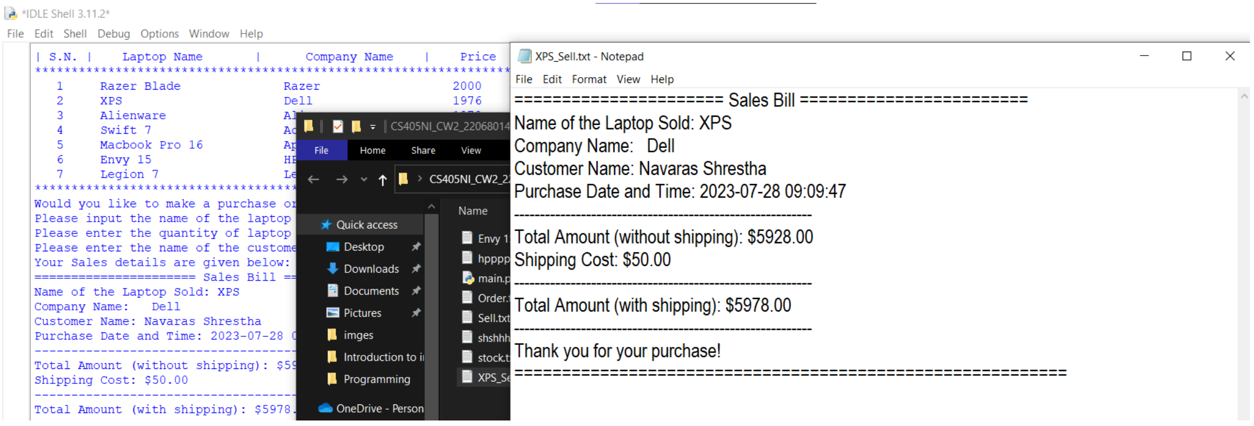
Figure 20: Second sale of laptop



```
| S.N. |    Laptop Name        |      Company Name    |    Price
*************************************************************************
   1     Razer Blade                Razer                   2000
   2     XPS                        Dell                    1976
   3     Alienware                  Al
   4     Swift 7                    Ac
   5     Macbook Pro 16             Ap
   6     Envy 15                    HP
   7     Legion 7                   Le
************************************
Would you like to make a purchase or
Please input the name of the laptop
Please enter the quantity of laptop
Please enter the name of the custome
Your Sales details are given below:
====================== Sales Bill ==
Name of the Laptop Sold: XPS
Company Name:   Dell
Customer Name: Navaras Shrestha
Purchase Date and Time: 2023-07-28 0
--------------------------------------
Total Amount (without shipping): $59
Shipping Cost: $50.00
--------------------------------------
Total Amount (with shipping): $5978.
--------------------------------------
Thank you for your purchase!
======================================
```

```
===================== Sales Bill ========================
Name of the Laptop Sold: Envy 15
Company Name:   HP
Customer Name: Navaras Shrestha
Purchase Date and Time: 2023-07-28 09:08:46
--------------------------------------------------------
Total Amount (without shipping): $5600.00
Shipping Cost: $50.00
--------------------------------------------------------
Total Amount (with shipping): $5650.00
--------------------------------------------------------
Thank you for your purchase!
=========================================================
```

Figure 21: First sale bill



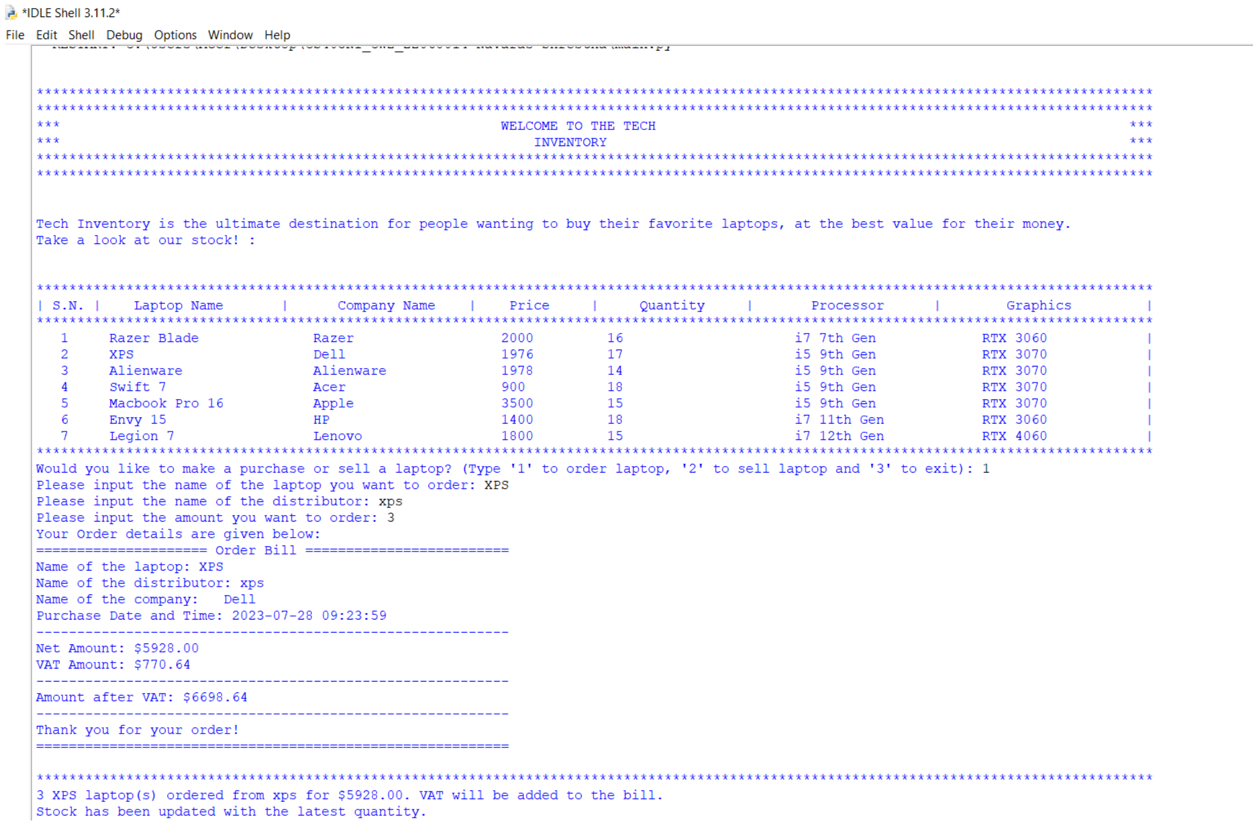
```
| S.N. |    Laptop Name        |      Company Name    |    Price
*************************************************************************
   1     Razer Blade                Razer                   2000
   2     XPS                        Dell                    1976
   3     Alienware                  Al
   4     Swift 7                    Ac
   5     Macbook Pro 16             Ap
   6     Envy 15                    HP
   7     Legion 7                   Le
************************************
Would you like to make a purchase or
Please input the name of the laptop
Please enter the quantity of laptop
Please enter the name of the custome
Your Sales details are given below:
====================== Sales Bill ==
Name of the Laptop Sold: XPS
Company Name:   Dell
Customer Name: Navaras Shrestha
Purchase Date and Time: 2023-07-28 0
--------------------------------------
Total Amount (without shipping): $59
Shipping Cost: $50.00
--------------------------------------
Total Amount (with shipping): $5978.
```

```
===================== Sales Bill ========================
Name of the Laptop Sold: XPS
Company Name:   Dell
Customer Name: Navaras Shrestha
Purchase Date and Time: 2023-07-28 09:09:47
--------------------------------------------------------
Total Amount (without shipping): $5928.00
Shipping Cost: $50.00
--------------------------------------------------------
Total Amount (with shipping): $5978.00
--------------------------------------------------------
Thank you for your purchase!
=========================================================
```

Figure 22: Second sale bill

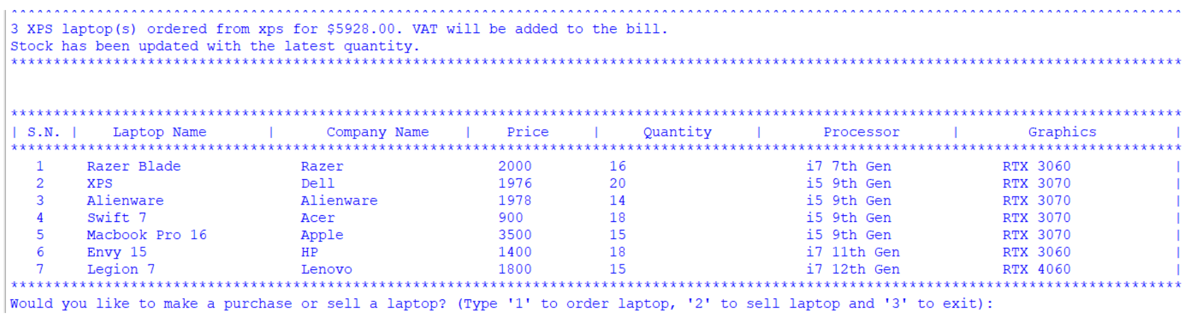
Test: 5

Objective	To show update in stock file
Actions	• Open your program files using IDLE • Run “main.py” program file using IDLE • Complete buying and selling process, and show update in quantity
Expected result	To be able to display updated stock after buying and selling
Actual result	Able to display updated stock
Conclusion	Test is a success.



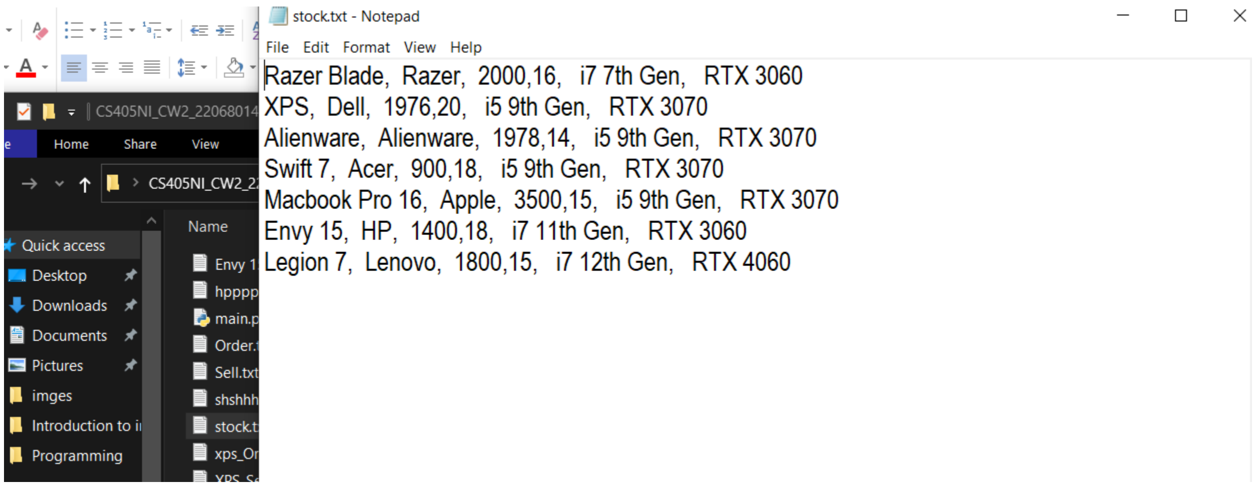
```
*****************************************************************************************************************************************
*****************************************************************************************************************************************
***                                                      WELCOME TO THE TECH                                                          ***
***                                                          INVENTORY                                                                ***
*****************************************************************************************************************************************
*****************************************************************************************************************************************


Tech Inventory is the ultimate destination for people wanting to buy their favorite laptops, at the best value for their money.
Take a look at our stock! :


*****************************************************************************************************************************************
| S.N. |    Laptop Name       |      Company Name    |    Price     |     Quantity     |       Processor      |        Graphics         |
*****************************************************************************************************************************************
   1     Razer Blade              Razer                  2000         16                     i7 7th Gen             RTX 3060            |
   2     XPS                      Dell                   1976         17                     i5 9th Gen             RTX 3070            |
   3     Alienware                Alienware              1978         14                     i5 9th Gen             RTX 3070            |
   4     Swift 7                  Acer                   900          18                     i5 9th Gen             RTX 3070            |
   5     Macbook Pro 16           Apple                  3500         15                     i5 9th Gen             RTX 3070            |
   6     Envy 15                  HP                     1400         18                     i7 11th Gen            RTX 3060            |
   7     Legion 7                 Lenovo                 1800         15                     i7 12th Gen            RTX 4060            |
*****************************************************************************************************************************************
Would you like to make a purchase or sell a laptop? (Type '1' to order laptop, '2' to sell laptop and '3' to exit): 1
Please input the name of the laptop you want to order: XPS
Please input the name of the distributor: xps
Please input the amount you want to order: 3
Your Order details are given below:
==================== Order Bill ========================
Name of the laptop: XPS
Name of the distributor: xps
Name of the company:   Dell
Purchase Date and Time: 2023-07-28 09:23:59
----------------------------------------------------------
Net Amount: $5928.00
VAT Amount: $770.64
----------------------------------------------------------
Amount after VAT: $6698.64
----------------------------------------------------------
Thank you for your order!
==========================================================

*****************************************************************************************************************************************
3 XPS laptop(s) ordered from xps for $5928.00. VAT will be added to the bill.
Stock has been updated with the latest quantity.
```

Figure 23: Buying XPS



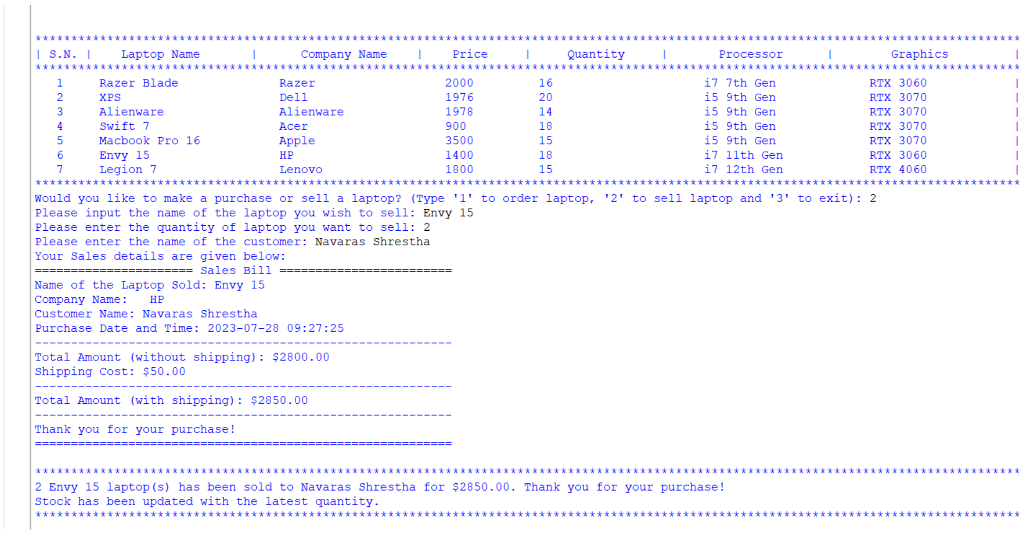
```
^^^^^^^^^^^^^^^^^^^^^^^^^^^^^^^^^^^^^^^^^^^^^^^^^^^^^^^^^^^^^^^^^^^^^^^^^^^^^^^^^^^^^^^^^^^^^^^^^^^^^^^^^^^^^^^^^^^^^^^^^^^^^^^^^^^^^^^^^
3 XPS laptop(s) ordered from xps for $5928.00. VAT will be added to the bill.
Stock has been updated with the latest quantity.
*****************************************************************************************************************************************


*****************************************************************************************************************************************
| S.N. |    Laptop Name       |      Company Name    |    Price     |     Quantity     |       Processor      |        Graphics         |
*****************************************************************************************************************************************
   1     Razer Blade              Razer                  2000         16                     i7 7th Gen             RTX 3060            |
   2     XPS                      Dell                   1976         20                     i5 9th Gen             RTX 3070            |
   3     Alienware                Alienware              1978         14                     i5 9th Gen             RTX 3070            |
   4     Swift 7                  Acer                   900          18                     i5 9th Gen             RTX 3070            |
   5     Macbook Pro 16           Apple                  3500         15                     i5 9th Gen             RTX 3070            |
   6     Envy 15                  HP                     1400         18                     i7 11th Gen            RTX 3060            |
   7     Legion 7                 Lenovo                 1800         15                     i7 12th Gen            RTX 4060            |
*****************************************************************************************************************************************
Would you like to make a purchase or sell a laptop? (Type '1' to order laptop, '2' to sell laptop and '3' to exit):
```

Figure 24: XPS stock updated and printed



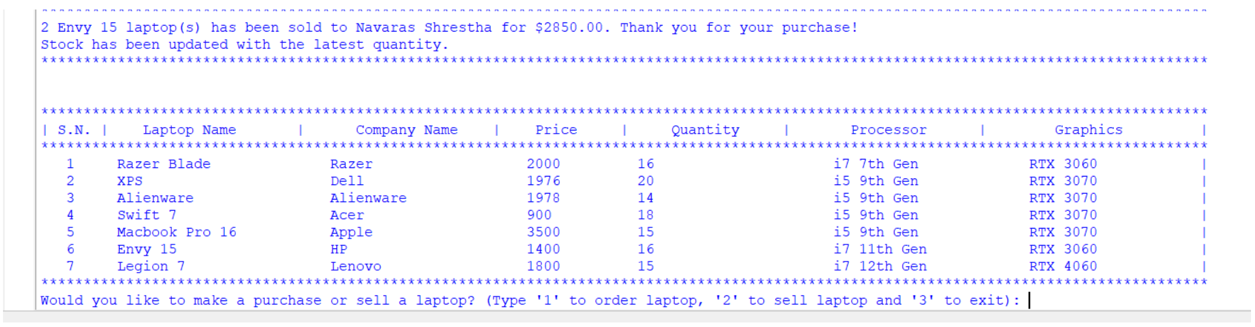
```
Razer Blade, Razer, 2000,16, i7 7th Gen, RTX 3060
XPS, Dell, 1976,20, i5 9th Gen, RTX 3070
Alienware, Alienware, 1978,14, i5 9th Gen, RTX 3070
Swift 7, Acer, 900,18, i5 9th Gen, RTX 3070
Macbook Pro 16, Apple, 3500,15, i5 9th Gen, RTX 3070
Envy 15, HP, 1400,18, i7 11th Gen, RTX 3060
Legion 7, Lenovo, 1800,15, i7 12th Gen, RTX 4060
```

Figure 25: stock.txt file updated



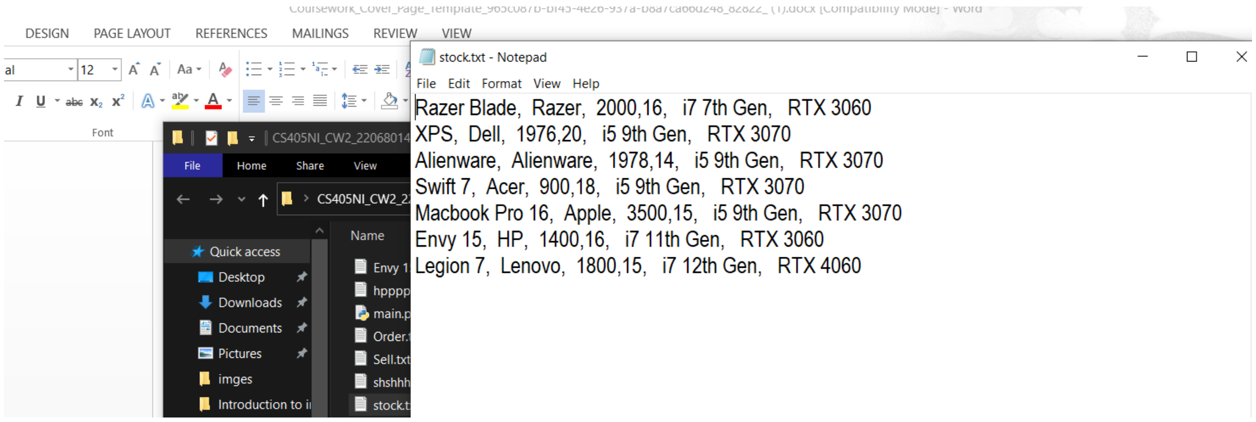
```
*****************************************************************************************************************************************
| S.N. |    Laptop Name       |      Company Name    |   Price     |     Quantity     |       Processor      |        Graphics          |
*****************************************************************************************************************************************
   1     Razer Blade               Razer                  2000         16                    i7 7th Gen             RTX 3060            |
   2     XPS                       Dell                   1976         20                    i5 9th Gen             RTX 3070            |
   3     Alienware                 Alienware              1978         14                    i5 9th Gen             RTX 3070            |
   4     Swift 7                   Acer                   900          18                    i5 9th Gen             RTX 3070            |
   5     Macbook Pro 16            Apple                  3500         15                    i5 9th Gen             RTX 3070            |
   6     Envy 15                   HP                     1400         18                    i7 11th Gen            RTX 3060            |
   7     Legion 7                  Lenovo                 1800         15                    i7 12th Gen            RTX 4060            |
*****************************************************************************************************************************************
Would you like to make a purchase or sell a laptop? (Type '1' to order laptop, '2' to sell laptop and '3' to exit): 2
Please input the name of the laptop you wish to sell: Envy 15
Please enter the quantity of laptop you want to sell: 2
Please enter the name of the customer: Navaras Shrestha
Your Sales details are given below:
====================== Sales Bill ========================
Name of the Laptop Sold: Envy 15
Company Name:   HP
Customer Name: Navaras Shrestha
Purchase Date and Time: 2023-07-28 09:27:25
----------------------------------------------------------
Total Amount (without shipping): $2800.00
Shipping Cost: $50.00
----------------------------------------------------------
Total Amount (with shipping): $2850.00
----------------------------------------------------------
Thank you for your purchase!
==========================================================

*****************************************************************************************************************************************
2 Envy 15 laptop(s) has been sold to Navaras Shrestha for $2850.00. Thank you for your purchase!
Stock has been updated with the latest quantity.
*****************************************************************************************************************************************
```

Figure 26: Envy 15 sold



```
2 Envy 15 laptop(s) has been sold to Navaras Shrestha for $2850.00. Thank you for your purchase!
Stock has been updated with the latest quantity.
*****************************************************************************************************************************************


*****************************************************************************************************************************************
| S.N. |    Laptop Name       |      Company Name    |   Price     |     Quantity     |       Processor      |        Graphics          |
*****************************************************************************************************************************************
   1     Razer Blade               Razer                  2000         16                    i7 7th Gen             RTX 3060            |
   2     XPS                       Dell                   1976         20                    i5 9th Gen             RTX 3070            |
   3     Alienware                 Alienware              1978         14                    i5 9th Gen             RTX 3070            |
   4     Swift 7                   Acer                   900          18                    i5 9th Gen             RTX 3070            |
   5     Macbook Pro 16            Apple                  3500         15                    i5 9th Gen             RTX 3070            |
   6     Envy 15                   HP                     1400         16                    i7 11th Gen            RTX 3060            |
   7     Legion 7                  Lenovo                 1800         15                    i7 12th Gen            RTX 4060            |
*****************************************************************************************************************************************
Would you like to make a purchase or sell a laptop? (Type '1' to order laptop, '2' to sell laptop and '3' to exit):
```

Figure 27: stock updated and printed



```
Razer Blade,  Razer,  2000,16,   i7 7th Gen,   RTX 3060
XPS,  Dell,  1976,20,   i5 9th Gen,   RTX 3070
Alienware,  Alienware,  1978,14,   i5 9th Gen,   RTX 3070
Swift 7,  Acer,  900,18,   i5 9th Gen,   RTX 3070
Macbook Pro 16,  Apple,  3500,15,   i5 9th Gen,   RTX 3070
Envy 15,  HP,  1400,16,   i7 11th Gen,   RTX 3060
Legion 7,  Lenovo,  1800,15,   i7 12th Gen,   RTX 4060
```

Figure 28: stock.txt updated

CONCLUSION

In conclusion, the development of this program to manage the available laptops in a rental shop, was a fun journey. Automating the ordering process from manufacturers, and generating notes/invoices for each transaction has been successful. I encountered a lot of errors during this project and had to do a lot of research to bring this coursework to fruition.

Because of this project, I believe to have gained valuable experience in software development, including designing and implementing different software systems and working with text files. For this instance, it was a laptop shop system. I have also learned how to manage and organize a project, including setting goals and objectives, developing a plan, and executing that plan.

However, this job wasn't as easy as it seems. I had to do a lot of research and take advice from my peers. Moreover, my teachers also had a huge hand in me being able to complete this coursework. So I am definitely grateful for that.

Consistently learning and evolving our programming skills further contributes to our problem solving skills. Coding is an ongoing process and this assignment definitely provided me with a valuable lesson and experience to develop my coding skills.

APPENDIX

read.py

```
def readfile(filename):

    '''

    Reads the laptop information from a file and stores it in the empty
dictionary.

    It returns dictionary containing laptop information, where the keys
are laptop names
    and the values are attributes like company, price, quantity,
    processor, and graphics for each laptop.

    '''

    laptopinfo = {}
    read = open(filename, "r")
    lines = read.readlines()
    read.close()

    for i in lines:
        items = i.strip().split(",")
        laptopname = items[0]
        company = items[1]
        price = items[2]
        quantity = int(items[3])
        processor = items[4]
        graphics = items[5]
        laptopinfo[laptopname] = {
            "company": company,
            "price": price,
            "quantity": quantity,
            "processor": processor,
            "graphics": graphics
        }

    return laptopinfo
```

write.py

```
def ordernote(laptopname, distributorname, companyname,
purchasedatetime, netamount):

    '''

    Generates an order note/invoice for a laptop purchase and saves it
to a text file.

    The function writes the order note to a file and does not return any
value.

    '''



    # Opening the text file and writing the order note/invoice:

    file = open(f"{distributorname}_Order.txt", "w")
    file.write("==================== Order Bill
=========================\n")
    file.write(f"Name of the laptop: {laptopname}\n")
    file.write(f"Name of the distributor: {distributorname}\n")
    file.write(f"Name of the company: {companyname}\n")
    file.write(f"Purchase Date and Time: {purchasedatetime_str}\n")
    file.write("------------------------------------------------------\n")
    file.write(f"Net Amount: ${netamount:.2f}\n")
    file.write(f"VAT Amount: ${vatamount:.2f}\n")
    file.write("------------------------------------------------------------\n")
    file.write(f"Amount after VAT: ${amountaftervat:.2f}\n")
    file.write("------------------------------------------------------------\n")
    file.write("Thank you for your order!\n")

file.write("==========================================================
=============\n")
    file.close()



def salenote(laptopname, companyname, customername,
purchasedatetime, totalamount, shippingcost):

    '''

    Generates an sale note/invoice for a laptop sold and saves it to a
text file.

    The function writes the sale note to a file and does not return any
value.

    '''



    # Write the sales note to a file

    file = open(f"{laptopname}_Sell.txt", "w")
    file.write("====================== Sales Bill
========================\n")
    file.write(f"Name of the Laptop Sold: {laptopname}\n")
    file.write(f"Company Name: {companyname}\n")
    file.write(f"Customer Name: {customername}\n")
    file.write(f"Purchase Date and Time: {purchasedatetime_str}\n")
    file.write("--------------------------------------------------------\n")
    file.write(f"Total Amount (without shipping): ${totalamount:.2f}\n")
    file.write(f"Shipping Cost: ${shippingcost:.2f}\n")
    file.write("--------------------------------------------------------\n")
    file.write(f"Total Amount (with shipping):
${amountaftershipping:.2f}\n")
    file.write("--------------------------------------------------------\n")
    file.write("Thank you for your purchase!\n")

file.write("=============================================
=============\n")
    file.close()


     #Updating the stock.txt file with updated values and displaying it to
the user:

        file = open("stock.txt", "w")

        for name, details in laptopinfo.items():

file.write(f"{name},{details['company']},{details['price']},{details['quantit
y']},{details['processor']},{details['graphics']}\n")

        file.close()
```

operation.py

```
def ordernote(laptopname, distributorname, companyname,
purchasedatetime, netamount):

    '''
    Generates an order note/invoice for a laptop purchase and saves it
to a text file.

    The function writes the order note to a file and does not return any
value.

    '''

    # Formatting the purchasedatetime to a string, and calculating
amount after VAT:

    purchasedatetime_str = purchasedatetime.strftime("%Y-%m-%d
%H:%M:%S")

    vatrate = 0.13
    vatamount = netamount * vatrate
    amountaftervat = netamount + vatamount


def order(laptopinfo):

    '''
    Places an order for a laptop from the given stock and generates an
order note.

    This function prompts the user to provide the laptopname,
distributorname, and desired quantity. It
    then calculates the amount based on the laptop's price and
quantity and generates an invoice.
    The invoice contains the current date and time.
    It also updates the quantity in the stock after the order is placed.
    '''

    loop = True
    while loop:
        try:
```

```
        laptopname = input("Please input the name of the laptop you
want to order: ")
        distributorname = input("Please input the name of the
distributor: ")

        if distributorname == '':
            print("Distributor name cannot be empty. Please re-enter
the name:")
            continue

        if laptopname in laptopinfo:
            # To prohibit user to enter negative number
            num = True
            while num:
                quantity = int(input("Please input the amount you want to
order: "))
                if quantity > 0:
                    break
                else:
                    print("Invalid quantity. Please enter a positive
number.")

            netamount = quantity * float(laptopinfo[laptopname]['price'])
            purchasedatetime = datetime.datetime.now()

            # Calling ordernote function
            ordernote(laptopname, distributorname,
laptopinfo[laptopname]['company'], purchasedatetime, netamount)

            # Updating the quantity of the sold laptop in the dictionary
            laptopinfo[laptopname]['quantity'] =
laptopinfo[laptopname]['quantity'] + quantity

             # Reading the order note file and printing its content
            with open(f"{distributorname}_Order.txt", "r") as file:
                text = file.read()
            print(f"Your Order details are given below:\n{text}")
print("******************************************************************
************************************************************")
            print(f"{quantity} {laptopname} laptop(s) ordered from
{distributorname} for ${netamount:.2f}. VAT will be added to the bill.")
            print("Stock has been updated with the latest quantity.")

print("******************************************************************
************************************************************")
            print("\n")
            break
         else:
            print("Please enter a valid laptop name.")
            continue
      except Exception:
         print("An error occurred. Please try again.")
         continue



def salenote(laptopname, companyname, customername,
purchasedatetime, totalamount, shippingcost):

   '''

   Generates an sale note/invoice for a laptop sold and saves it to a
text file.

   The function writes the sale note to a file and does not return any
value.

   '''

   # Formatting purchasedatetime to a string, and calculating amount
after shipping cost
```

```
    purchasedatetime_str = purchasedatetime.strftime("%Y-%m-%d
%H:%M:%S")

    amountaftershipping = totalamount + shippingcost


def sell(laptopinfo):

    '''
    This function initiates the selling process of a laptop to a customer
and generates a bill.

    This function prompts the user to provide the customername,
laptopname, and desired quantity. It
    then calculates the amount based on the laptop's price and
quantity, adds shipping cost,
    and generates an invoice. The invoice will also contain the proper
date and time.
    It also updates the quantity in the stock after the laptop is sold to a
customer.
    '''

    sales = True
    while sales:

        try:
            laptopname = input("Please input the name of the laptop you
wish to sell: ")

            if laptopname in laptopinfo:

                while True:
                    quantity = int(input("Please enter the quantity of laptop
you want to sell: "))
                    if quantity > 0:
                        break
                    else:
```

```
                  print("Invalid quantity. Please enter a positive
number.")

            if quantity <= laptopinfo[laptopname]['quantity']:
                shippingcost = 50
                totalamount = quantity *
float(laptopinfo[laptopname]['price'])
                customername = input("Please enter the name of the
customer: ")
                purchasedatetime = datetime.datetime.now()

                # Calling salenote function
                salenote(laptopname, laptopinfo[laptopname]['company'],
customername, purchasedatetime, totalamount, shippingcost)

                # Updating the quantity of the sold laptop in the laptops
dictionary
                laptopinfo[laptopname]['quantity'] =
laptopinfo[laptopname]['quantity'] - quantity

                 # Reading the sales note file and printing its content
                with open(f"{laptopname}_Sell.txt", "r") as file:
                    text = file.read()
                print(f"Your Sales details are given below:\n{text}")


print("*******************************************************************
*************************************************************")
                print(f"{quantity} {laptopname} laptop(s) has been sold to
{customername} for ${totalamount + shippingcost:.2f}. Thank you for
your purchase!")
                print("Stock has been updated with the latest quantity.")

print("*******************************************************************
*************************************************************")
                print("\n")
                break
```

```
          else:
              print("Please enter a valid quantity.")
              continue
      else:
          print("Please input a valid laptop name.")
          continue
  except ValueError:
      print("Invalid input! Please enter a valid quantity data
(integer).")
      continue
```

main.py

```
def display(laptopinfo):

    '''

    This function takes laptopinfo(name of the dictionary) as parameter
and prints
    all its information on the user's screen.
    It loops through the dictionary to display values.

    '''


print("******************************************************************************
**********************************************************************")
    print("| S.N. |    Laptop Name        |      Company Name    |    Price
|     Quantity     |        Processor       |        Graphics         |")

print("******************************************************************************
**********************************************************************")

    l = 1
    for name, details in laptopinfo.items():
          print(f"    {l:<4}  {name:<21}  {details['company']:<21}
{details['price']:<13}  {details['quantity']:<19} {details['processor']:<22}
{details['graphics']:<23}| ")
          l=l+1

print("******************************************************************
**************************************************************")



#Running the readfile function that reads the text file and stores it in a
dictionary, then running function to display the data:

laptopinfo = readfile("stock.txt")

display(laptopinfo)


#Main block of code where user is asked to choose between order,
sell or termination of program.

def mainloop():

    '''

    This function is the main entry point where the program loops until
and unless the user is satisfied with buying or
    selling the laptops.
    The program asks the user to input 1,2 or 3 in order to buy, sell or
exit respectively. Entering 1 calls order function, 2 calls
    sell function and 3 terminates the loop using "break" statement and
ends the program.

    The stock is updated based on what user chooses to do, and
displayed on the screen.
```

```
    '''

    ask = True
    while ask:

        yeet = input("Would you like to make a purchase or sell a
laptop? (Type '1' to order laptop, '2' to sell laptop and '3' to exit): ")


        if yeet == "1":
            order(laptopinfo)

        elif yeet == "2":
            sell(laptopinfo)

        elif yeet == "3":
            print("\n")

print("***********************************************************************
****************************************************************")
            print("\t\t\t\t\t Thank you for the transaction! Please do
remember us again!")

print("***********************************************************************
****************************************************************")
            break
        else:
            print("Invalid input. Please enter '1', '2' or '3'.")
            continue


        #Updating the stock.txt file with updated values and displaying it
to the user:

        file = open("stock.txt", "w")

        for name, details in laptopinfo.items():
```

```
file.write(f"{name},{details['company']},{details['price']},{details['quantit
y']},{details['processor']},{details['graphics']}\n")

        file.close()

        display(laptopinfo)


mainloop()
```

ALL CODES:
(shop.py)

```
print("\n")
print("**************************************************************************
******************************************************************")
print("**************************************************************************
******************************************************************")
print("*** \t\t\t\t\t\t        WELCOME TO THE TECH   \t\t\t\t\t\t      ***")
print("*** \t\t\t\t\t\t           INVENTORY        \t\t\t\t\t\t      ***")
print("**************************************************************************
******************************************************************")
print("**************************************************************************
******************************************************************")
print("\n")
print("Tech Inventory is the ultimate destination for people wanting to
buy their favorite laptops, at the best value for their money.")
print("Take a look at our stock! :")
print("\n")


#Importing and Accessing the datetime module of python

import datetime
```

```
def readfile(filename):

    '''

    Reads the laptop information from a file and stores it in the empty
dictionary.

    It returns dictionary containing laptop information, where the keys
are laptop names
    and the values are attributes like company, price, quantity,
    processor, and graphics for each laptop.

    '''

    laptopinfo = {}
    read = open(filename, "r")
    lines = read.readlines()
    read.close()

    for i in lines:
        items = i.strip().split(",")
        laptopname = items[0]
        company = items[1]
        price = items[2]
        quantity = int(items[3])
        processor = items[4]
        graphics = items[5]
        laptopinfo[laptopname] = {
            "company": company,
            "price": price,
            "quantity": quantity,
            "processor": processor,
            "graphics": graphics
        }
    return laptopinfo



def display(laptopinfo):

    '''

    This function takes laptopinfo(name of the dictionary) as parameter
and prints
    all its information on the user's screen.
    It loops through the dictionary to display values.

    '''


print("*******************************************************************
***************************************************************")
    print("| S.N. |    Laptop Name       |      Company Name    |    Price
|     Quantity     |       Processor       |       Graphics         |")

print("*******************************************************************
***************************************************************")

    l = 1
    for name, details in laptopinfo.items():
         print(f"    {l:<4}  {name:<21}  {details['company']:<21}
{details['price']:<13}  {details['quantity']:<19} {details['processor']:<22}
{details['graphics']:<23}| ")
         l=l+1

print("*******************************************************************
***************************************************************")
```

```
#Running the readfile function that reads the text file and stores it in a
dictionary, then running function to display the data:

laptopinfo = readfile("stock.txt")

display(laptopinfo)



def ordernote(laptopname, distributorname, companyname,
purchasedatetime, netamount):

    '''

    Generates an order note/invoice for a laptop purchase and saves it
to a text file.

    The function writes the order note to a file and does not return any
value.

    '''

    # Formatting the purchasedatetime to a string, and calculating
amount after VAT:

    purchasedatetime_str = purchasedatetime.strftime("%Y-%m-%d
%H:%M:%S")

    vatrate = 0.13
    vatamount = netamount * vatrate
    amountaftervat = netamount + vatamount

    # Opening the text file and writing the order note/invoice:

    file = open(f"{distributorname}_Order.txt", "w")
    file.write("==================== Order Bill
========================\n")
```

```
    file.write(f"Name of the laptop: {laptopname}\n")
    file.write(f"Name of the distributor: {distributorname}\n")
    file.write(f"Name of the company: {companyname}\n")
    file.write(f"Purchase Date and Time: {purchasedatetime_str}\n")
    file.write("--------------------------------------------------------\n")
    file.write(f"Net Amount: ${netamount:.2f}\n")
    file.write(f"VAT Amount: ${vatamount:.2f}\n")
    file.write("--------------------------------------------------------\n")
    file.write(f"Amount after VAT: ${amountaftervat:.2f}\n")
    file.write("--------------------------------------------------------\n")
    file.write("Thank you for your order!\n")

file.write("==========================================
=============\n")
    file.close()



def order(laptopinfo):

    '''
    Places an order for a laptop from the given stock and generates an
order note.

    This function prompts the user to provide the laptopname,
distributorname, and desired quantity. It
    then calculates the amount based on the laptop's price and
quantity and generates an invoice.
    The invoice contains the current date and time.
    It also updates the quantity in the stock after the order is placed.
    '''

    loop = True
    while loop:
        try:
            laptopname = input("Please input the name of the laptop you
want to order: ")
```

```
        distributorname = input("Please input the name of the 
distributor: ")

        if distributorname == '':
            print("Distributor name cannot be empty. Please re-enter 
the name:")
            continue

        if laptopname in laptopinfo:
            # To prohibit user to enter negative number
            num = True
            while num:
                quantity = int(input("Please input the amount you want to 
order: "))
                if quantity > 0:
                    break
                else:
                    print("Invalid quantity. Please enter a positive 
number.")

            netamount = quantity * float(laptopinfo[laptopname]['price'])
            purchasedatetime = datetime.datetime.now()

            # Calling ordernote function
            ordernote(laptopname, distributorname, 
laptopinfo[laptopname]['company'], purchasedatetime, netamount)

            # Updating the quantity of the sold laptop in the dictionary
            laptopinfo[laptopname]['quantity'] = 
laptopinfo[laptopname]['quantity'] + quantity

            # Reading the order note file and printing its content
            with open(f"{distributorname}_Order.txt", "r") as file:
                text = file.read()
            print(f"Your Order details are given below:\n{text}")
print("***************************************************************************
********************************************************************")
            print(f"{quantity} {laptopname} laptop(s) ordered from 
{distributorname} for ${netamount:.2f}. VAT will be added to the bill.")
            print("Stock has been updated with the latest quantity.")

print("***************************************************************************
********************************************************************")
            print("\n")
            break
         else:
            print("Please enter a valid laptop name.")
            continue
      except Exception:
         print("An error occurred. Please try again.")
         continue




def salenote(laptopname, companyname, customername, 
purchasedatetime, totalamount, shippingcost):

   '''

   Generates an sale note/invoice for a laptop sold and saves it to a 
text file.

   The function writes the sale note to a file and does not return any 
value.

   '''

   # Formatting purchasedatetime to a string, and calculating amount 
after shipping cost
```

```
    purchasedatetime_str = purchasedatetime.strftime("%Y-%m-%d
%H:%M:%S")

    amountaftershipping = totalamount + shippingcost


    # Write the sales note to a file

    file = open(f"{laptopname}_Sell.txt", "w")
    file.write("====================== Sales Bill
========================\n")
    file.write(f"Name of the Laptop Sold: {laptopname}\n")
    file.write(f"Company Name: {companyname}\n")
    file.write(f"Customer Name: {customername}\n")
    file.write(f"Purchase Date and Time: {purchasedatetime_str}\n")
    file.write("------------------------------------------------------------\n")
    file.write(f"Total Amount (without shipping): ${totalamount:.2f}\n")
    file.write(f"Shipping Cost: ${shippingcost:.2f}\n")
    file.write("------------------------------------------------------------\n")
    file.write(f"Total Amount (with shipping):
${amountaftershipping:.2f}\n")
    file.write("------------------------------------------------------------\n")
    file.write("Thank you for your purchase!\n")

file.write("=============================================
=============\n")
    file.close()



def sell(laptopinfo):

    '''
    This function initiates the selling process of a laptop to a customer
and generates a bill.
```

```
    This function prompts the user to provide the customername,
laptopname, and desired quantity. It
    then calculates the amount based on the laptop's price and
quantity, adds shipping cost,
    and generates an invoice. The invoice will also contain the proper
date and time.
    It also updates the quantity in the stock after the laptop is sold to a
customer.
    '''

    sales = True
    while sales:

        try:
            laptopname = input("Please input the name of the laptop you
wish to sell: ")

            if laptopname in laptopinfo:

                while True:
                    quantity = int(input("Please enter the quantity of laptop
you want to sell: "))
                    if quantity > 0:
                        break
                    else:
                        print("Invalid quantity. Please enter a positive
number.")

                if quantity <= laptopinfo[laptopname]['quantity']:
                    shippingcost = 50
                    totalamount = quantity *
float(laptopinfo[laptopname]['price'])
                    customername = input("Please enter the name of the
customer: ")
                    purchasedatetime = datetime.datetime.now()

                    # Calling salenote function
                salenote(laptopname, laptopinfo[laptopname]['company'],
customername, purchasedatetime, totalamount, shippingcost)

                # Updating the quantity of the sold laptop in the laptops
dictionary
                laptopinfo[laptopname]['quantity'] =
laptopinfo[laptopname]['quantity'] - quantity

                # Reading the sales note file and printing its content
                with open(f"{laptopname}_Sell.txt", "r") as file:
                    text = file.read()
                print(f"Your Sales details are given below:\n{text}")


print("************************************************************************
*****************************************************************")
                print(f"{quantity} {laptopname} laptop(s) has been sold to
{customername} for ${totalamount + shippingcost:.2f}. Thank you for
your purchase!")
                print("Stock has been updated with the latest quantity.")

print("************************************************************************
*****************************************************************")
                print("\n")
                break
            else:
                print("Please enter a valid quantity.")
                continue
        else:
            print("Please input a valid laptop name.")
            continue
    except ValueError:
        print("Invalid input! Please enter a valid quantity data
(integer).")
        continue
```

```
#Main block of code where user is asked to choose between order,
sell or termination of program.

def mainloop():

    '''

    This function is the main entry point where the program loops until
and unless the user is satisfied with buying or
    selling the laptops.
    The program asks the user to input 1,2 or 3 in order to buy, sell or
exit respectively. Entering 1 calls order function, 2 calls
    sell function and 3 terminates the loop using "break" statement and
ends the program.

    The stock is updated based on what user chooses to do, and
displayed on the screen.

    '''

    ask = True
    while ask:

        yeet = input("Would you like to make a purchase or sell a
laptop? (Type '1' to order laptop, '2' to sell laptop and '3' to exit): ")


        if yeet == "1":
            order(laptopinfo)

        elif yeet == "2":
            sell(laptopinfo)

        elif yeet == "3":
            print("\n")

print("************************************************************************
*****************************************************************")
            print("\t\t\t\t\t Thank you for the transaction! Please do
remember us again!")

print("************************************************************************
*****************************************************************")
            break
        else:
            print("Invalid input. Please enter '1', '2' or '3'.")
            continue


        #Updating the stock.txt file with updated values and displaying it
to the user:

        file = open("stock.txt", "w")

        for name, details in laptopinfo.items():

file.write(f"{name},{details['company']},{details['price']},{details['quantit
y']},{details['processor']},{details['graphics']}\n")

        file.close()

        display(laptopinfo)


mainloop()
```