PES UNIVERSITY

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100 Ft. Road, BSK III Stage, Bengaluru – 560 085

DEPARTMENT OF COMPUTER SCIENCE AND ENGINEERING

Course Title: Problem Solving with C Laboratory
Course code: UE19CS152

Semester : II sem	**Section: S**	**Team ID: 11**

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PROJECT REPORT

Problem Statement

Development of a Customer Billing System which allows the user to:

- Add Customer Details
- View existing Customer Details
- Access the Billing Module:
  - Add, edit, remove items
  - Display Bill with the correct bill amount, considering the tax, discount, etc

Description

Note:
The code was written in Codeblocks. Conio.h is a non-standard C library which gives us functionalities such as getche() required for file handling(console input/output), in place of functions like getchar() which is used for standard input/output.
This is a library not available while using ubuntu, but can be replaced with the curses.h library.

In addition to the minimum requirements as stated by the problem statement above:
The program also includes extra features:

- The Customer database is Password Protected.
- Past Customer Billing Details and History is made available
-

This project has 3 main Parts to it :

1. Product Database
2. Customer Database
3. Billing Functionalities

<u>Product database:</u>

Using which client is allowed to:

- Remove products
- Add products
- Edit product details (which again has 3 options)
    1. Replace the product and quantity, which in turn changes the price
    2. Replace only the product which also changes the price
    3. Replace only the quantity in this case product and price remains same

<u>Customer Database:</u>

- The added feature of password protection has been implemented here.
  To be able to add an account to the customer database, or to search for an existing account, the client has to enter the valid password, which is predefined and fixed in the code. Only then will they be allowed to use the following features.

If the password is correct, the
Customer database allows the client to either :

- ◆ Add account on list
    - For each new customer account to be added, inputted are: Name of Customer, City, Account ID, Phone number.

- ◆ Search customer account
  - Once the customer name is entered, the details of that customer are printed,if the account exists.
  - If the account does not exist, it prints a message saying the same.
- ◆ Exit

Billing functionalities include:

1.Enter Products to bill:

This option allows the user to input the item, quantity and price -- for each product. This step replaces the way products are usually scanned with a barcode scanner to get the details. We do not have a barcode scanner here, so the client enters the product, its quantity and price *manually*.

First, the name of the customer is taken.
Then, we also take the date as we keep a copy of the bill which can be used for future reference,i.e, tax purposes, accountability, etc.
The, the product and its details (price & qty) are

2.Print Bill:

This bill display option displays:

-The name of the shop
- Date of transaction
-Product name
-Produce price per unit
-Quantity
-Total price
-Calculates total bill amount and displays it
-Discounts amount from total price after redeeming points
-calculates and adds 18% tax on the total amount
-The Grand Total

3.Exit

Added Benefits:

To help manage **past billing history** for customers, every transaction for a customer is stored in a file of the customer's name. When this file is opened, one can see the date of billing, the products billed for, subtotal, price after discounting, and finally the grand total for each transaction taken place till date.

As now, the billing history of each customer is stored, the client can now maintain a record of what bills have been made. This is especially useful for tracking and for tax procedures.

In addition, highly sensitive customer data is **password protected** and can only be accessed with the entry of the correct password.

C-concepts used

Control Structures
User defined functions
Multiple Files
Switch case
Data structures
Pointers
Array of structures
Files - Accessing, writing and reading

Learning Outcome and extra features

The project helped us familiarise ourselves with C. In addition to being able to now use functions, pointers, control structures, structures and arrays comfortably, we also found ourselves comfortable with extra components we learnt and implemented on our own.

Self-Learning Components enabled:

1. Binary File Operation

   - Since binary files are stored in binary form, it is easier for the compiler to parse these files. Hence, the associated processes are executed faster and more smoothly.

   - It is to be noted that we began our project implementation with respect to files much before it was officially taught by faculty. We learnt file handling concept, at least those required for this project, on our own using online resources like geeks4geeks and stackexchange -- hence, classifying this under self-learning.

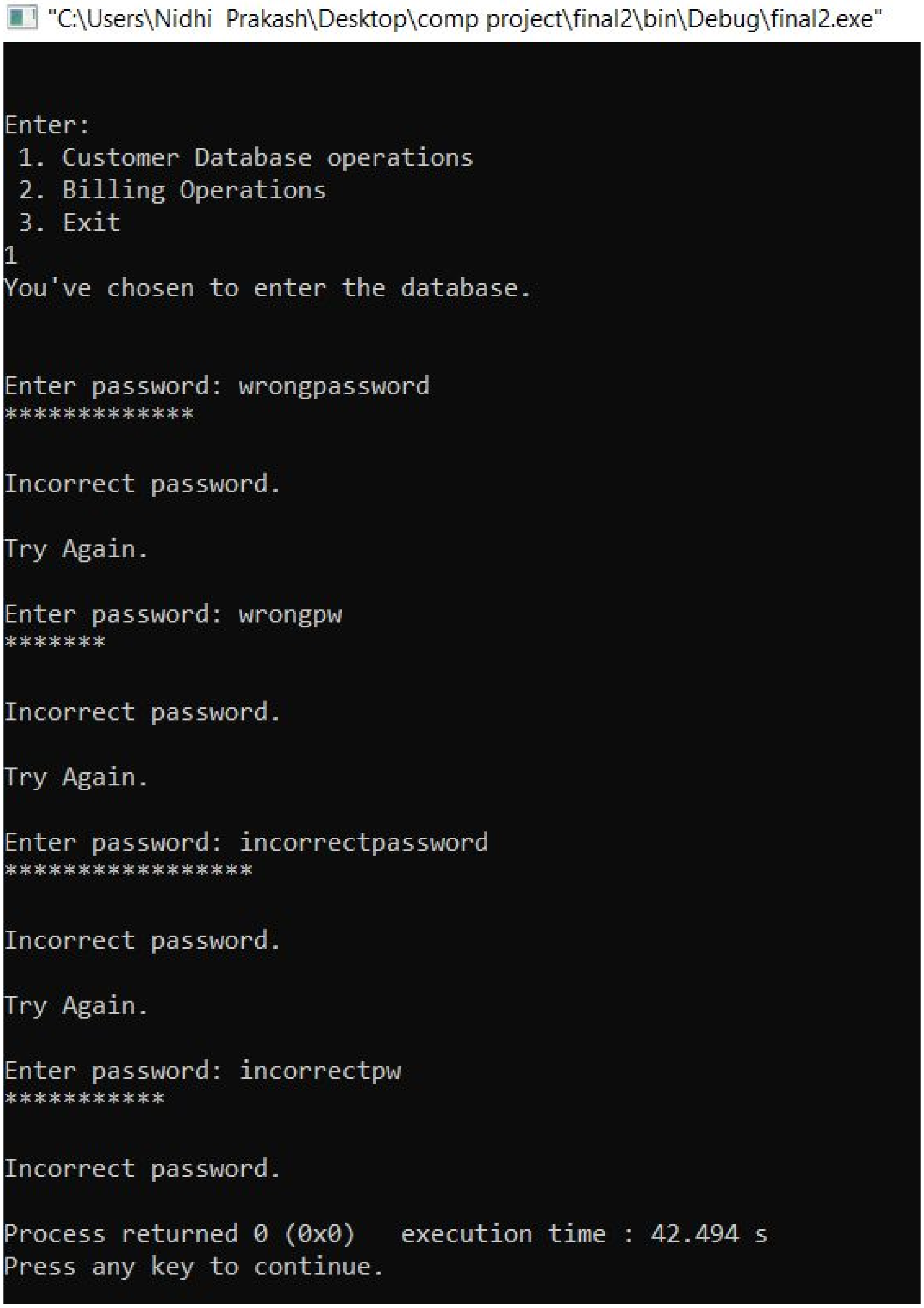
2. File Reading & writing and Array of Structures
   - Our program uses file writing and reading extensively. This has been implemented along with an array of structures.

- As mentioned in the description above, each transaction's bill will be stored and written into the file of each customer -- so when a file for each customer is opened, one can see past transactions and bill history.
- **Copy of file stored** - history of purchase of each customer which can be used for reference. We believe this has important real world applications such as helping shop-keepers maintain accountability and also for reference while doing administrative work and taxes.

3. Password Protection
    - The core sensitive information such as the customer data stored in the database is protected by a fixed password.

In addition to what we learnt technically, this project also helped us solve problems together as a team and brainstorm to use the correct data structures to implement ways to solve the problem statements given. We have also learnt how to deliver what the customer requires, and give them functions beyond what their minimum requirements are. Teamwork and coordinated efforts were also streamlined in the way we went about working out the code for this project.

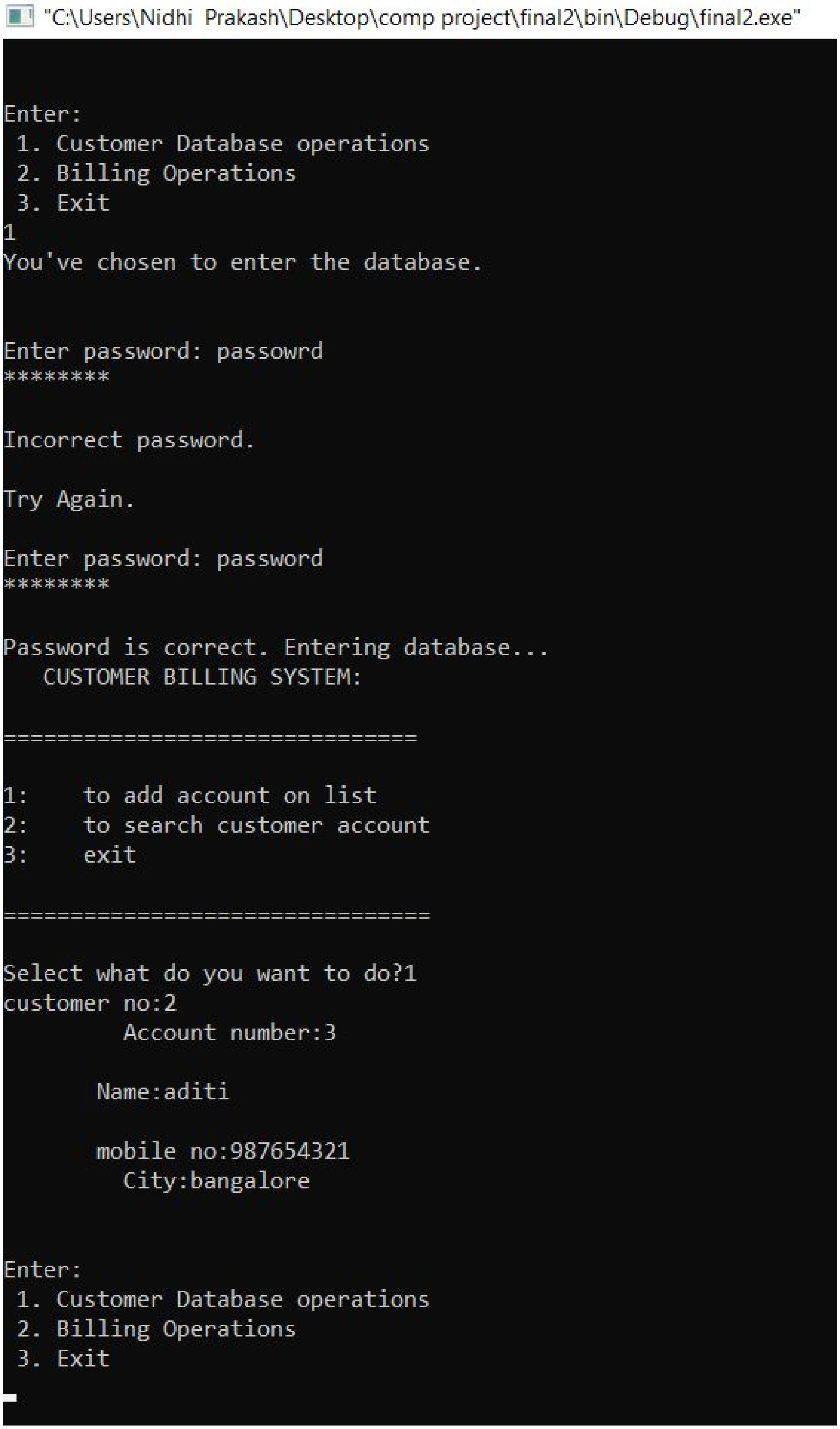
Output Screenshots



"C:\Users\Nidhi Prakash\Desktop\comp project\final2\bin\Debug\final2.exe"

```
Enter:
 1. Customer Database operations
 2. Billing Operations
 3. Exit
1
You've chosen to enter the database.


Enter password: wrongpassword
*************


Incorrect password.

Try Again.

Enter password: wrongpw
*******


Incorrect password.

Try Again.

Enter password: incorrectpassword
*****************


Incorrect password.

Try Again.

Enter password: incorrectpw
***********


Incorrect password.

Process returned 0 (0x0)   execution time : 42.494 s
Press any key to continue.
```

Fig1: Denies entry and exits program after 4 incorrect password attempts



"C:\Users\Nidhi Prakash\Desktop\comp project\final2\bin\Debug\final2.exe"

```
Enter:
 1. Customer Database operations
 2. Billing Operations
 3. Exit
1
You've chosen to enter the database.


Enter password: passowrd
********

Incorrect password.

Try Again.

Enter password: password
********

Password is correct. Entering database...
   CUSTOMER BILLING SYSTEM:

===============================

1:    to add account on list
2:    to search customer account
3:    exit

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Select what do you want to do?1
customer no:2
         Account number:3

       Name:aditi

       mobile no:987654321
         City:bangalore


Enter:
 1. Customer Database operations
 2. Billing Operations
 3. Exit
```
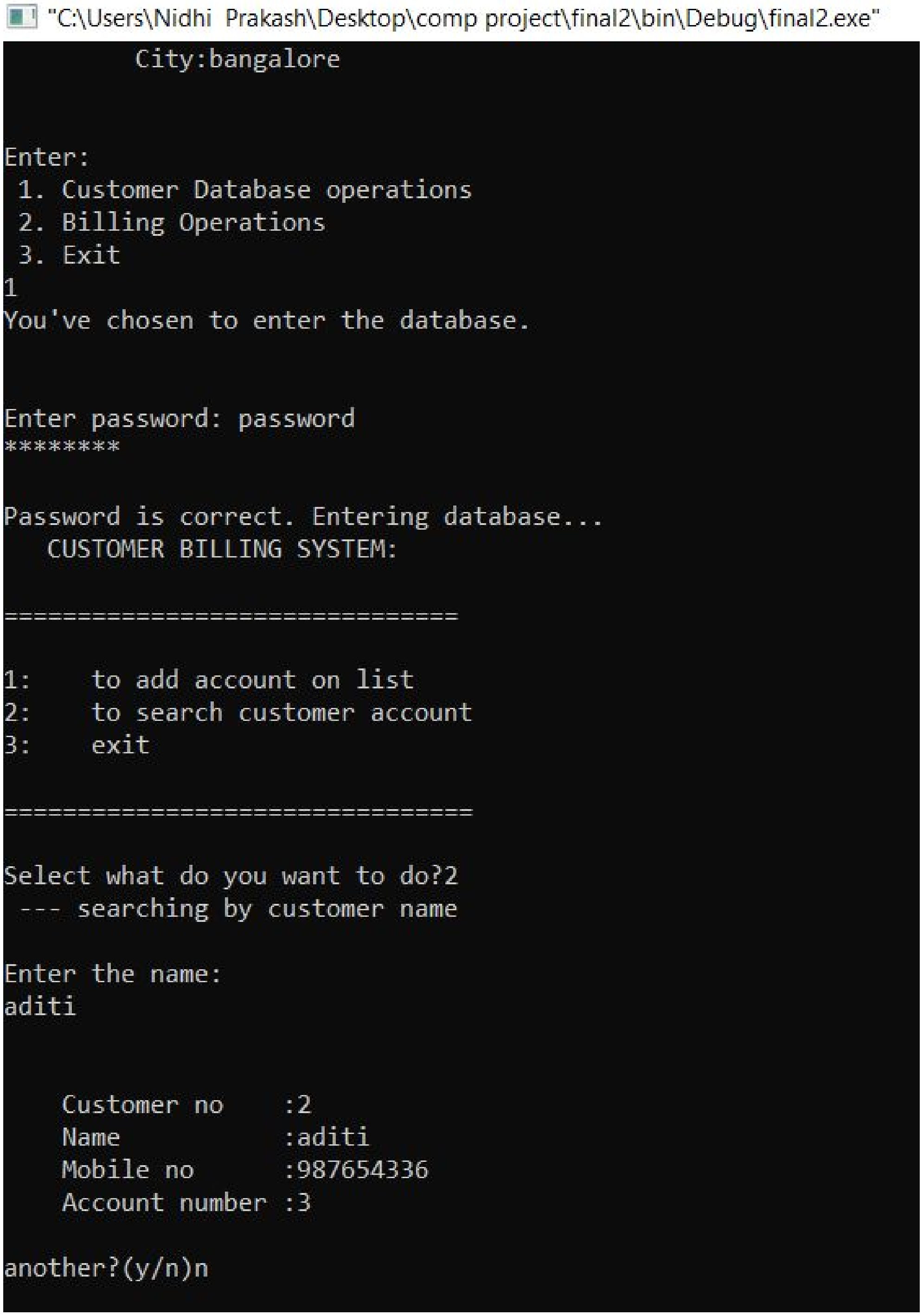
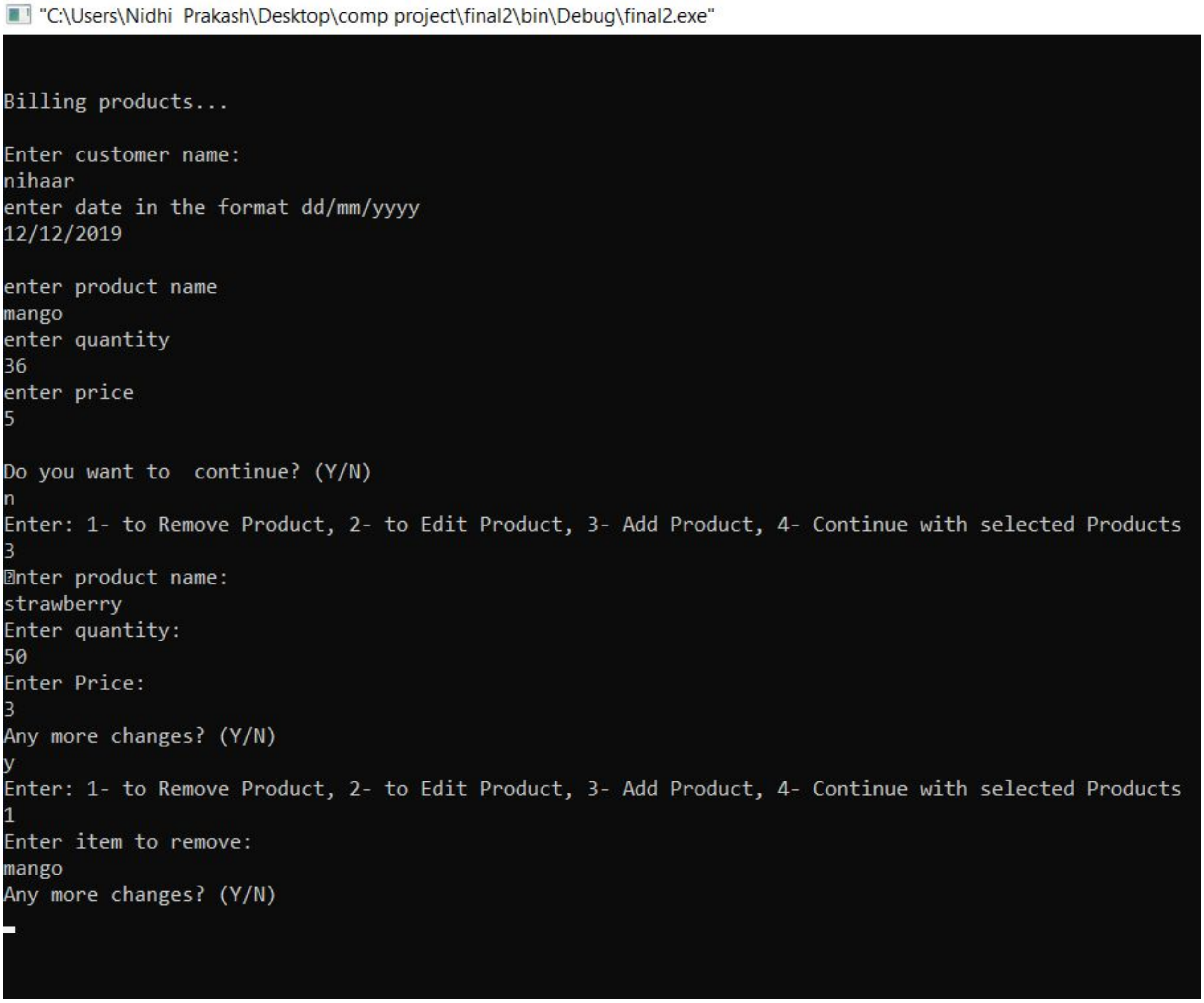

Fig2: Adding account to customer database


"C:\Users\Nidhi Prakash\Desktop\comp project\final2\bin\Debug\final2.exe"

```
         City:bangalore


Enter:
 1. Customer Database operations
 2. Billing Operations
 3. Exit
1
You've chosen to enter the database.


Enter password: password
********


Password is correct. Entering database...
   CUSTOMER BILLING SYSTEM:

===============================

1:    to add account on list
2:    to search customer account
3:    exit

================================

Select what do you want to do?2
 --- searching by customer name

Enter the name:
aditi


    Customer no    :2
    Name           :aditi
    Mobile no      :987654336
    Account number :3

another?(y/n)n
```

Fig3: Searching for customer in database and displaying details

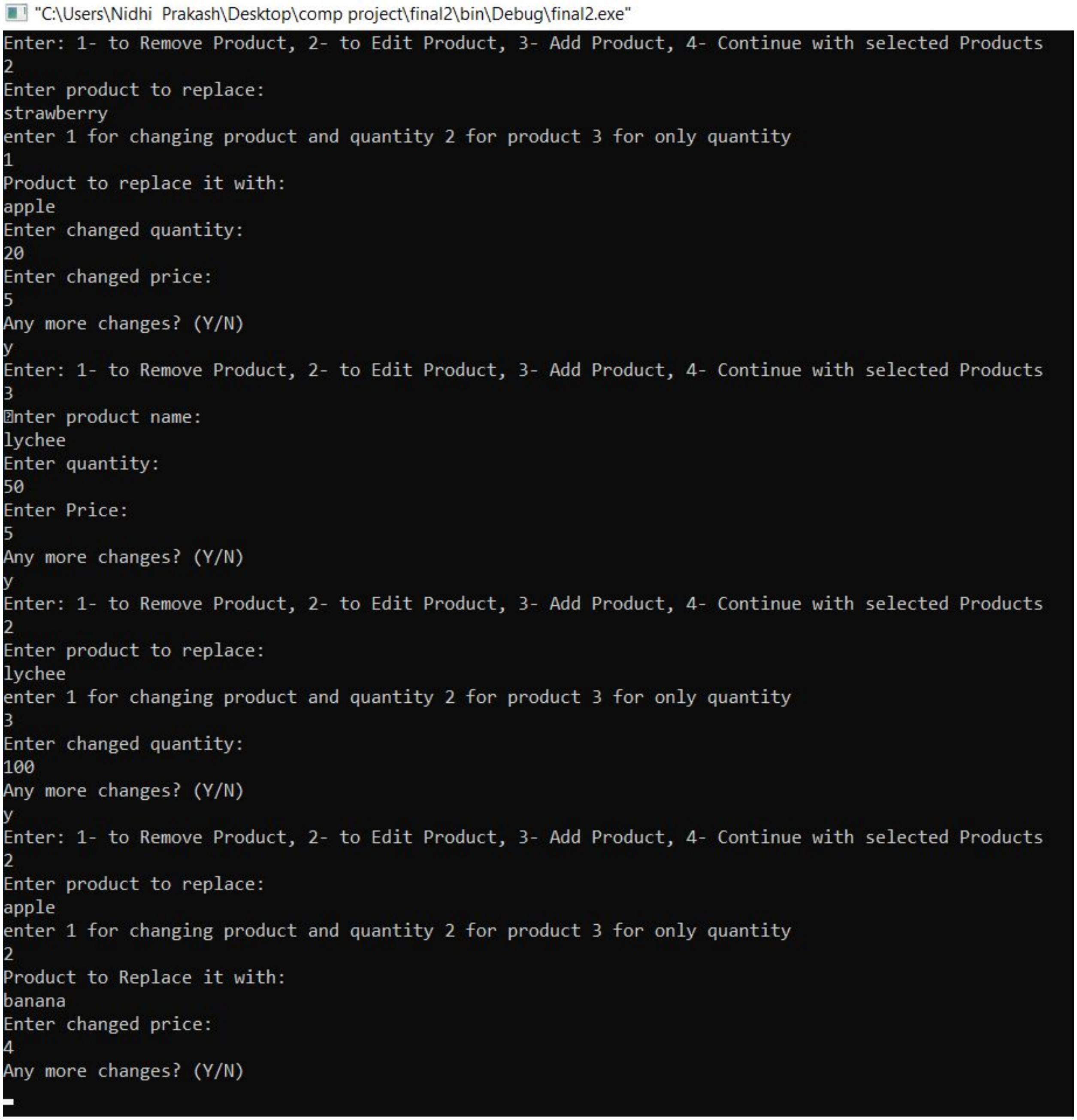

"C:\Users\Nidhi Prakash\Desktop\comp project\final2\bin\Debug\final2.exe"

```
Billing products...

Enter customer name:
nihaar
enter date in the format dd/mm/yyyy
12/12/2019

enter product name
mango
enter quantity
36
enter price
5

Do you want to  continue? (Y/N)
n
Enter: 1- to Remove Product, 2- to Edit Product, 3- Add Product, 4- Continue with selected Products
3
?nter product name:
strawberry
Enter quantity:
50
Enter Price:
3
Any more changes? (Y/N)
y
Enter: 1- to Remove Product, 2- to Edit Product, 3- Add Product, 4- Continue with selected Products
1
Enter item to remove:
mango
Any more changes? (Y/N)
```

Fig4: Billing operations:

1.Entering products to bill

Cases shown: add item, remove item



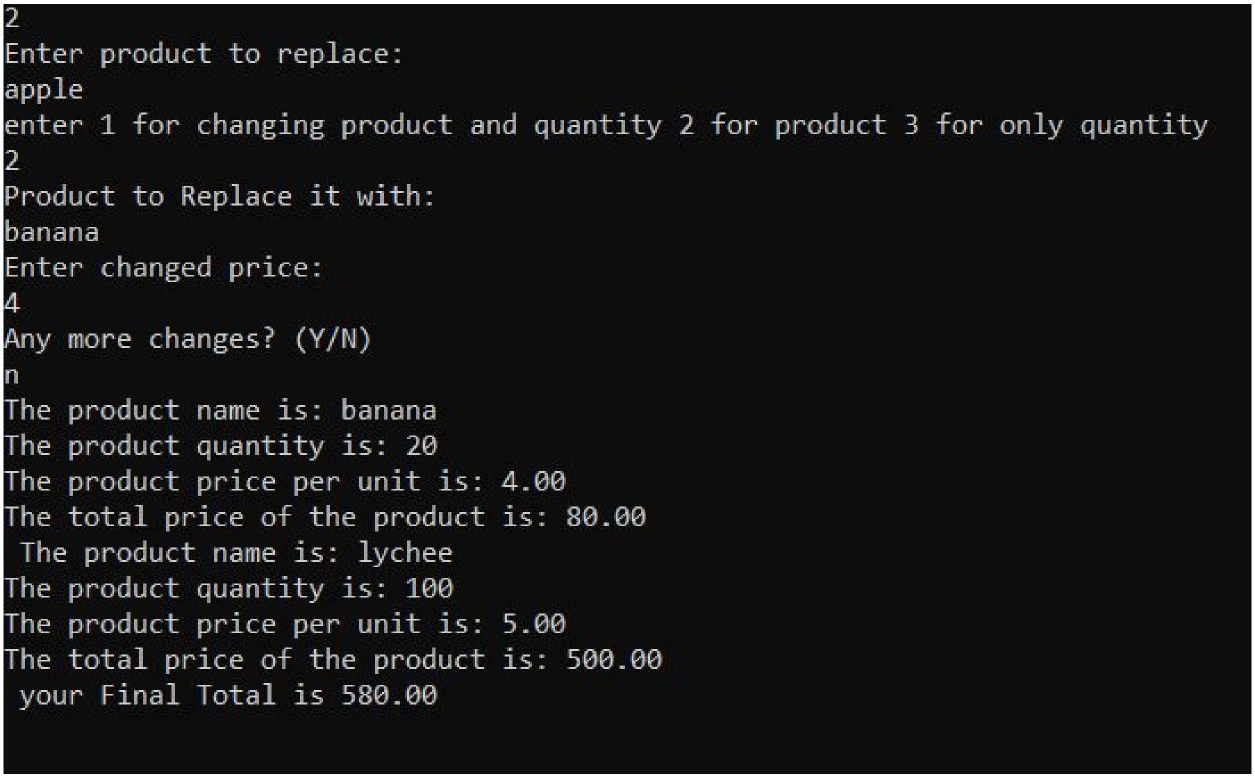
"C:\Users\Nidhi Prakash\Desktop\comp project\final2\bin\Debug\final2.exe"

```
Enter: 1- to Remove Product, 2- to Edit Product, 3- Add Product, 4- Continue with selected Products
2
Enter product to replace:
strawberry
enter 1 for changing product and quantity 2 for product 3 for only quantity
1
Product to replace it with:
apple
Enter changed quantity:
20
Enter changed price:
5
Any more changes? (Y/N)
y
Enter: 1- to Remove Product, 2- to Edit Product, 3- Add Product, 4- Continue with selected Products
3
�nter product name:
lychee
Enter quantity:
50
Enter Price:
5
Any more changes? (Y/N)
y
Enter: 1- to Remove Product, 2- to Edit Product, 3- Add Product, 4- Continue with selected Products
2
Enter product to replace:
lychee
enter 1 for changing product and quantity 2 for product 3 for only quantity
3
Enter changed quantity:
100
Any more changes? (Y/N)
y
Enter: 1- to Remove Product, 2- to Edit Product, 3- Add Product, 4- Continue with selected Products
2
Enter product to replace:
apple
enter 1 for changing product and quantity 2 for product 3 for only quantity
2
Product to Replace it with:
banana
Enter changed price:
4
Any more changes? (Y/N)
_
```

Fig5: Billing Operations

1.Entering products to bill

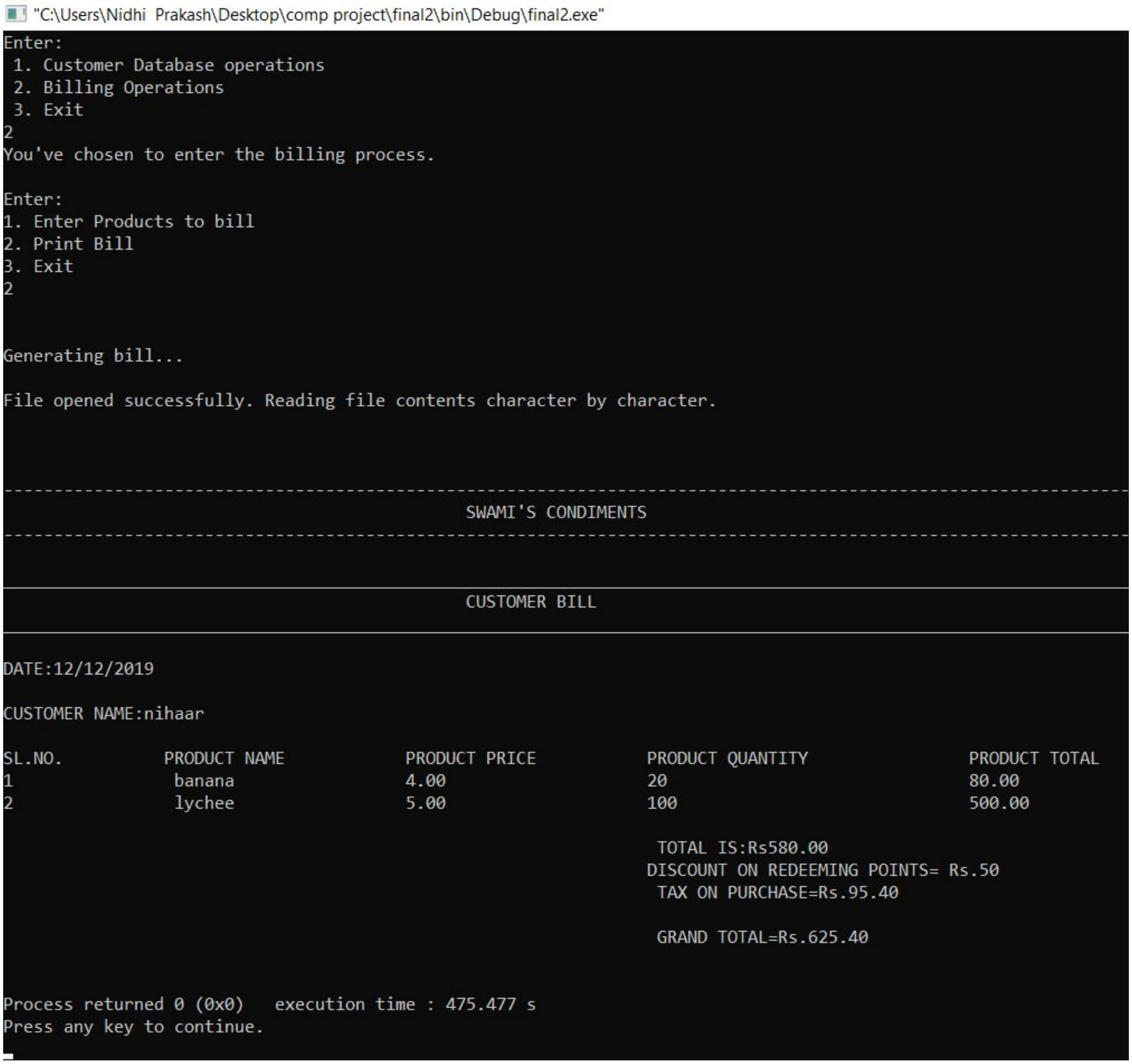
Cases shown: edit item, all cases,i.e, i)changing product and quantity
ii)changing product
iii)changing only quantity



```
2
Enter product to replace:
apple
enter 1 for changing product and quantity 2 for product 3 for only quantity
2
Product to Replace it with:
banana
Enter changed price:
4
Any more changes? (Y/N)
n
The product name is: banana
The product quantity is: 20
The product price per unit is: 4.00
The total price of the product is: 80.00
 The product name is: lychee
The product quantity is: 100
The product price per unit is: 5.00
The total price of the product is: 500.00
 your Final Total is 580.00
```

Fig6: Displays final list of products purchased after allowing to add,remove,edit,etc.

Displays net total of products without taking into consideration discounts and taxes.

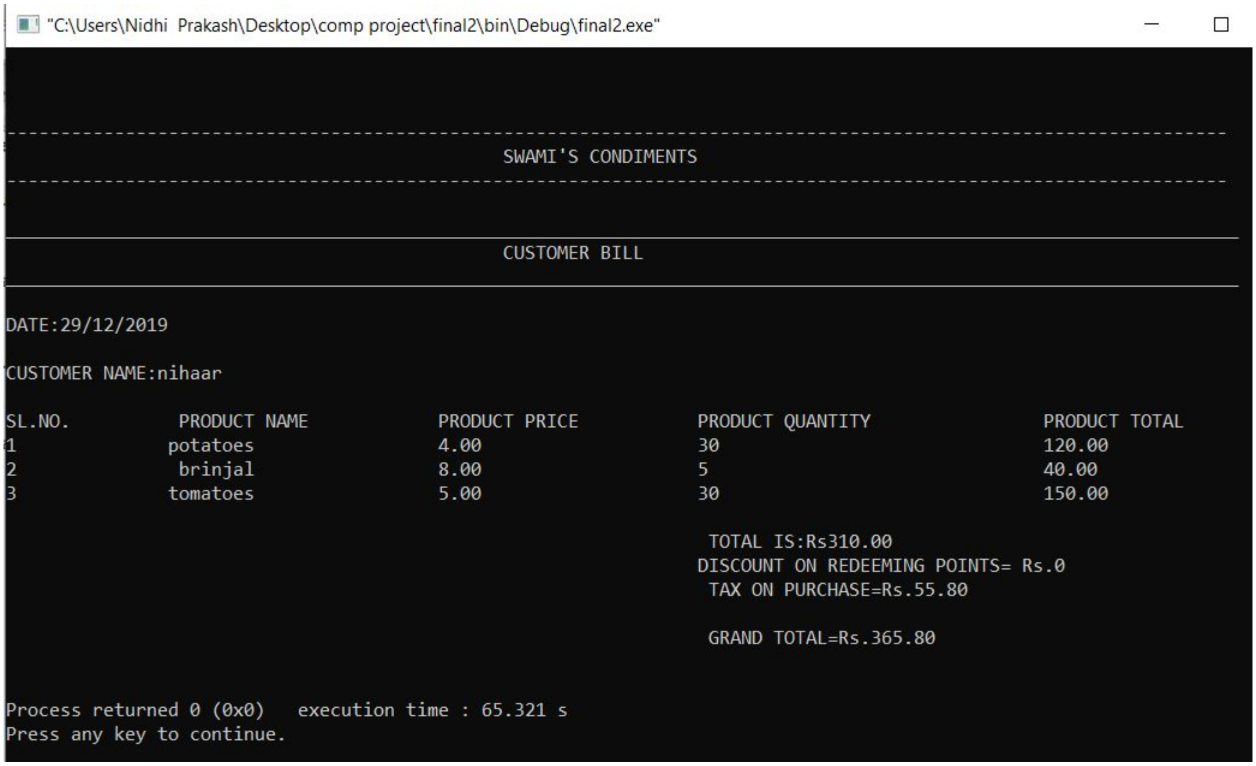

"C:\Users\Nidhi Prakash\Desktop\comp project\final2\bin\Debug\final2.exe"

```
Enter:
 1. Customer Database operations
 2. Billing Operations
 3. Exit
2
You've chosen to enter the billing process.

Enter:
1. Enter Products to bill
2. Print Bill
3. Exit
2


Generating bill...

File opened successfully. Reading file contents character by character.



----------------------------------------------------------------------------------------------------------------
                                              SWAMI'S CONDIMENTS
----------------------------------------------------------------------------------------------------------------


                                              CUSTOMER BILL


DATE:12/12/2019

CUSTOMER NAME:nihaar

SL.NO.          PRODUCT NAME            PRODUCT PRICE           PRODUCT QUANTITY                PRODUCT TOTAL
1                banana                 4.00                    20                              80.00
2                lychee                 5.00                    100                             500.00

                                                                 TOTAL IS:Rs580.00
                                                                DISCOUNT ON REDEEMING POINTS= Rs.50
                                                                 TAX ON PURCHASE=Rs.95.40

                                                                 GRAND TOTAL=Rs.625.40


Process returned 0 (0x0)   execution time : 475.477 s
Press any key to continue.
```

Fig7: Final Bill

Grand total includes discounts,taxes,etc. and is the total amount payable by the customer.
A copy of this is also saved for future reference under the name of the customer.

Suppose the same customer makes another purchase at the store on a different day, with the following bill:



"C:\Users\Nidhi Prakash\Desktop\comp project\final2\bin\Debug\final2.exe"

```


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                                              SWAMI'S CONDIMENTS
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─────────────────────────────────────────────────────────────────────────────────────────────────────────────────
                                              CUSTOMER BILL
─────────────────────────────────────────────────────────────────────────────────────────────────────────────────

DATE:29/12/2019

CUSTOMER NAME:nihaar

SL.NO.          PRODUCT NAME            PRODUCT PRICE           PRODUCT QUANTITY                PRODUCT TOTAL
1              potatoes                 4.00                    30                              120.00
2               brinjal                 8.00                    5                               40.00
3              tomatoes                 5.00                    30                              150.00

                                                                 TOTAL IS:Rs310.00
                                                                DISCOUNT ON REDEEMING POINTS= Rs.0
                                                                 TAX ON PURCHASE=Rs.55.80

                                                                 GRAND TOTAL=Rs.365.80


Process returned 0 (0x0)   execution time : 65.321 s
Press any key to continue.
```
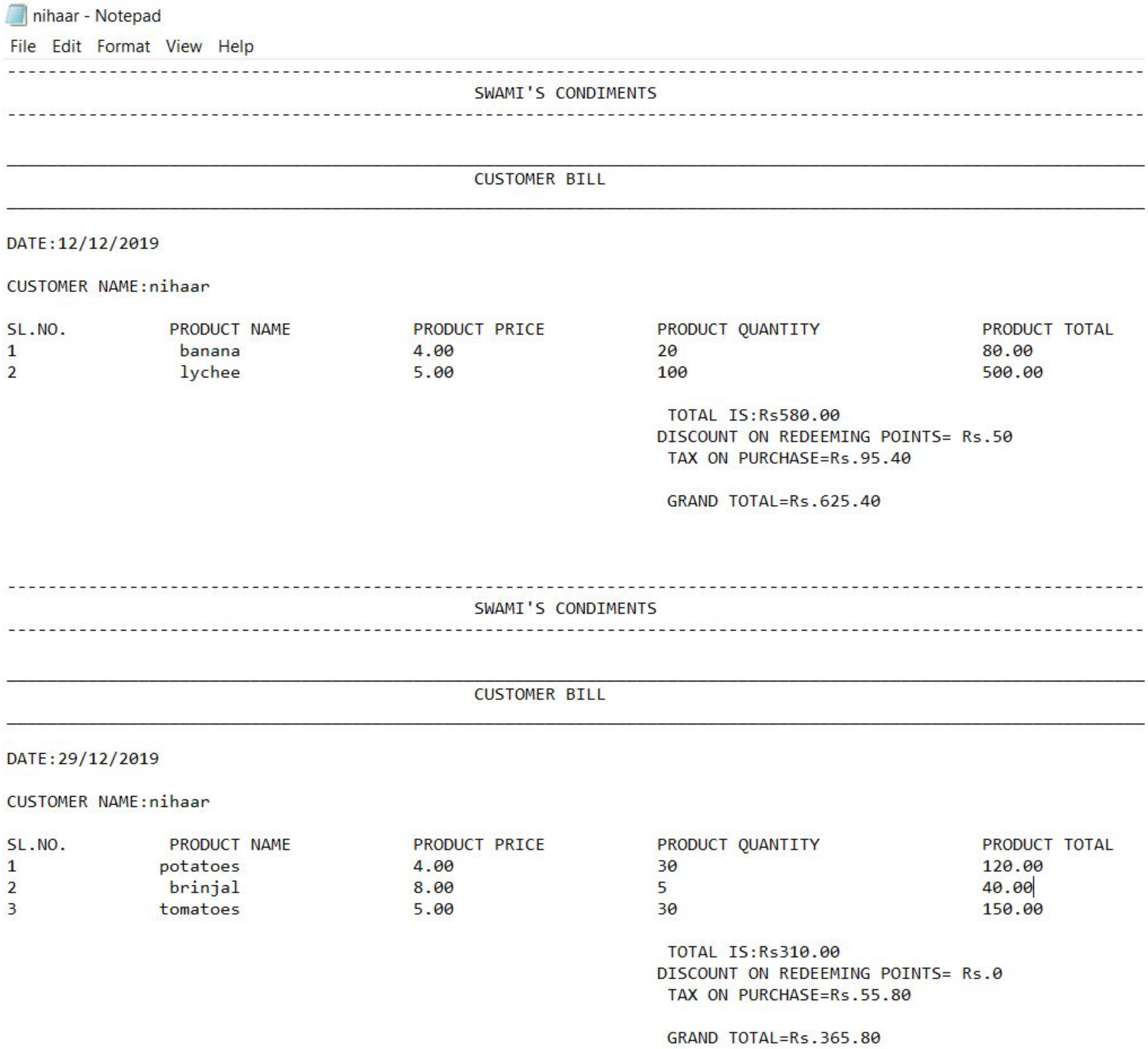

Fig8: Another example of final bill

Then, we can see both these bills in a file under the name of the customer.



```
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                                             SWAMI'S CONDIMENTS
--------------------------------------------------------------------------------------------------------------

______________________________________________________________________________________________________________
                                             CUSTOMER BILL
______________________________________________________________________________________________________________

DATE:12/12/2019

CUSTOMER NAME:nihaar

SL.NO.          PRODUCT NAME           PRODUCT PRICE          PRODUCT QUANTITY                PRODUCT TOTAL
1                banana                4.00                   20                              80.00
2                lychee                5.00                   100                             500.00

                                                               TOTAL IS:Rs580.00
                                                              DISCOUNT ON REDEEMING POINTS= Rs.50
                                                               TAX ON PURCHASE=Rs.95.40

                                                               GRAND TOTAL=Rs.625.40



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                                             SWAMI'S CONDIMENTS
--------------------------------------------------------------------------------------------------------------

______________________________________________________________________________________________________________
                                             CUSTOMER BILL
______________________________________________________________________________________________________________

DATE:29/12/2019

CUSTOMER NAME:nihaar

SL.NO.          PRODUCT NAME           PRODUCT PRICE          PRODUCT QUANTITY                PRODUCT TOTAL
1              potatoes                4.00                   30                              120.00
2               brinjal                8.00                   5                               40.00
3              tomatoes                5.00                   30                              150.00

                                                               TOTAL IS:Rs310.00
                                                              DISCOUNT ON REDEEMING POINTS= Rs.0
                                                               TAX ON PURCHASE=Rs.55.80

                                                               GRAND TOTAL=Rs.365.80
```

Fig9: History of purchase

Since, this shows us the date of purchase, total amount spent, tax on purchase, etc, we believe this could be an important feature which would help with accountability and also for administrative and tax purposes.

This is the end of all the output screenshots.

Name and Signature of the Faculty: