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

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Proposal

Introduction

As the requirement of our coursework, we have chosen to make a Computer Accessories Store Application which is developed on a java swing-based application. In this application, user can store and display categories and items related to computer accessories. This application enables the user to search the product available in the store according to the price. The main target of this project report is to create a GUI that helps a Computer Accessories Store to interact with the user to search for required product and to add any new product in the store. In this generation, all the old book-writing system to store the information about the stores has been replaced with advanced computerized method. And this application is one of those advanced method. Since this is a large project, we worked in a group and worked to achieve a common goal.

List of Data

The computer accessories application will have a form to input the computer accessories data and add it to the store. The form will have following type of inputs:

S. No.	Data Title	Data Type	Components
1	Product ID	String	Text Field
2	Categories	String	Combo Box
3	Company	String	Text Field
4	Warranty	String	Radio Button
5	Price	Integer	Text Field
6	Description	String	Text Field

List of Features

Some of the features that the software developed in this coursework are as follows:

- It will have the capability to add a new computer accessories product to the store with specific information provided by the user.
- All the products available in the store will be displayed in the table.
- Computer accessories can be searched according to the price.
- The search method will be based on binary search algorithm.
- With the help of “HELP” tab, user can read the manual about how the software works.
- It will prevent the user to enter invalid data in specific fields through validation and constrains.

- The UI that interacts with the user will be perfectly managed with creative user interface.
- It will have a button to query how many products are available in specific category of computer accessories.

Tools Used

NetBeans

Figure 1: NetBeans (snapcraft, 2019)

NetBeans is an open-source integrated development environment (IDE) for developing software development products with Java, PHP, C++, and other programming languages. On this project, we are going to use NetBeans for developing GUI to store and display the computer accessories items. NetBeans can be run on any operating system which supports a compatible JVM including LINUX, Windows and OS X and include features like designing GUI by dragging and positioning palette onto a canvas, text editor with refactoring tools and code templates making the programming more convenient and efficient. (TheServerSide, 2019)

Microsoft Visio (For GUI Prototyping)

Figure 2: Visio (logolynx, 2016)

Microsoft Visio is a software for designing and drawing diagrams, charts and graph using given shapes and templates. This application guarantees the security of information by means of data encryption, robust backup and secure data centres. Many reviews refer Microsoft Visio to the best flowchart software thanks to its intuitively comprehensive user interface. It helps us to have plan or design before starting to develop the application. Before developing the application in our project, we are required to design a Wireframe which represents framework of our GUI. This wireframe is the backbone to design the outlook of our software. It describes how our project interacts with the user and give us some idea about how the inputs from the user are taken. *(iconscout, 2019)*

Individual Task:

For the completion of this group coursework, first of all we gathered a meeting and note down the requirement of the assignment. Then, we discussed on classifying coursework into three different parts and agreed to do research on that part and meet on regular basis for further discussion. Each Individual have a contribution for the completion of assignment on time and each individual responsibility are mentioned below:

Student Name	University ID	Task Performed
Sujan Bhetwal	18029890	• Wireframe of the GUI • Designing GUI on NetBeans • Coding part to accept only integer value by TextField
Ayush Amatya	18029908	• Coding part of Computer Accessories Details JPanel • Coding part of Query Available Products JPanel • File Menu part of system
Basanta Shrestha	18029880	• Coding part of Add Product to Store JPanel • Coding part of Search Products JPanel • Help Menu part of system

Sujan Bhetwal	18029890	• Documentation part of Cover Page, Content Page, Introduction and Conclusion • Own part of Individual Task of report
Ayush Amatya	18029908	• Documentation part of description on Binary search algorithm with its diagram • Testing for evidence on successful working of source code • Own part of Individual Task of report
Basanta Shrestha	18029880	• Documentation on description of each method created in MenuInfo class • Own part of Individual Task of report
Ayush Amatya Basanta Shrestha Sujan Bhetwal	18029908 18029880 18029890	Finally, each individual gathered together to organize every part of the assignment and also to accomplish for final submission

Name: Sujan Bhetwal

ID: 18029890

Wireframe of the GUI

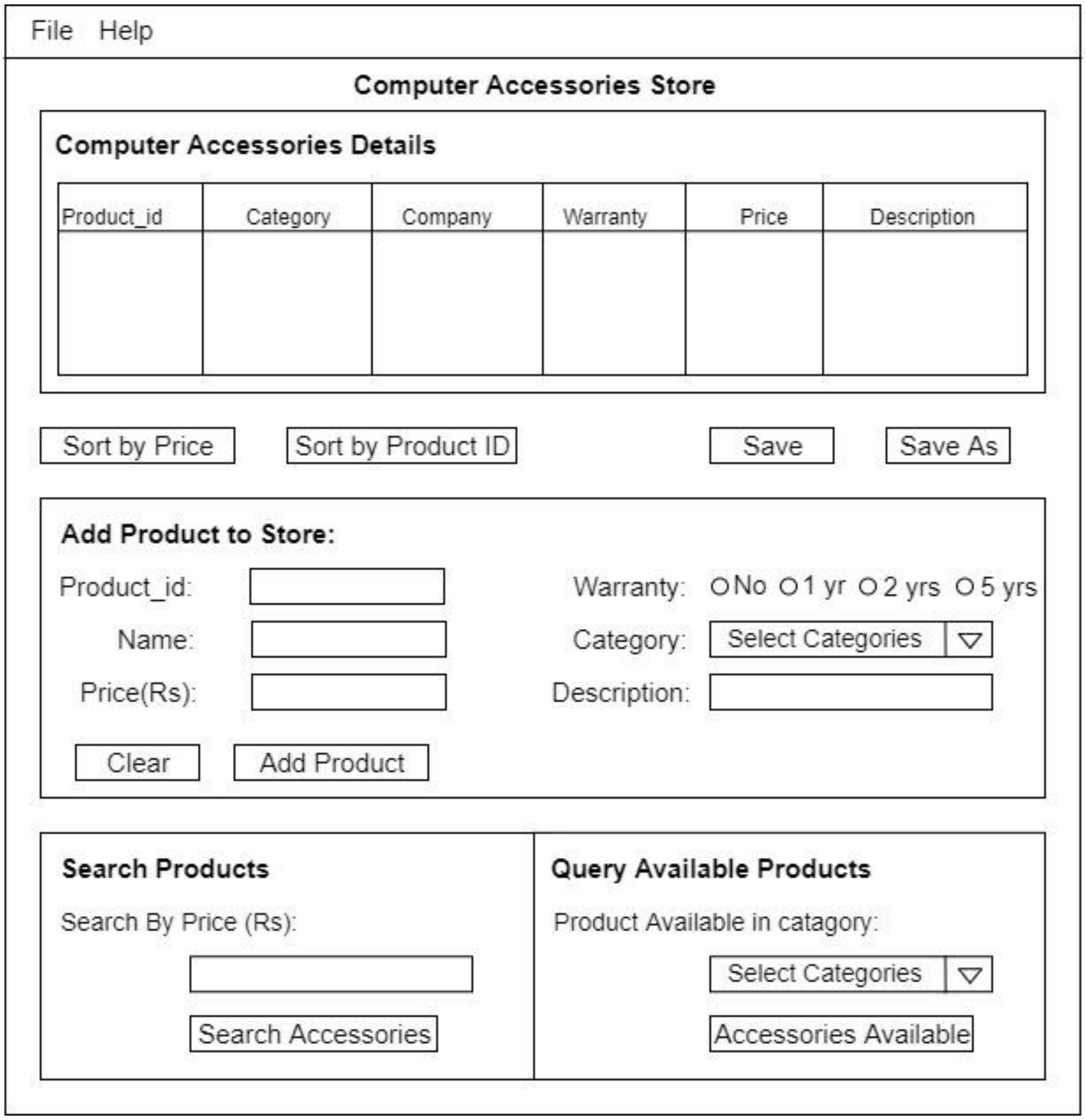


Figure 3: Screenshot of wireframe of system

For the development of wireframe, each requirement are noted down and they are analysed to design a wireframe for the system. According to requirement, it should include at least following things:

- Simple menu bar with at least File and Help item
- JTable to display product_id, category, company, warranty, price and description of product

- Feature to accept details of products manually
- Feature to search product by price
- Function for querying dishes available in a category

To have all these features and functions, above wireframe is designed which consists above requirements and also other extra features.

Real-time window of GUI

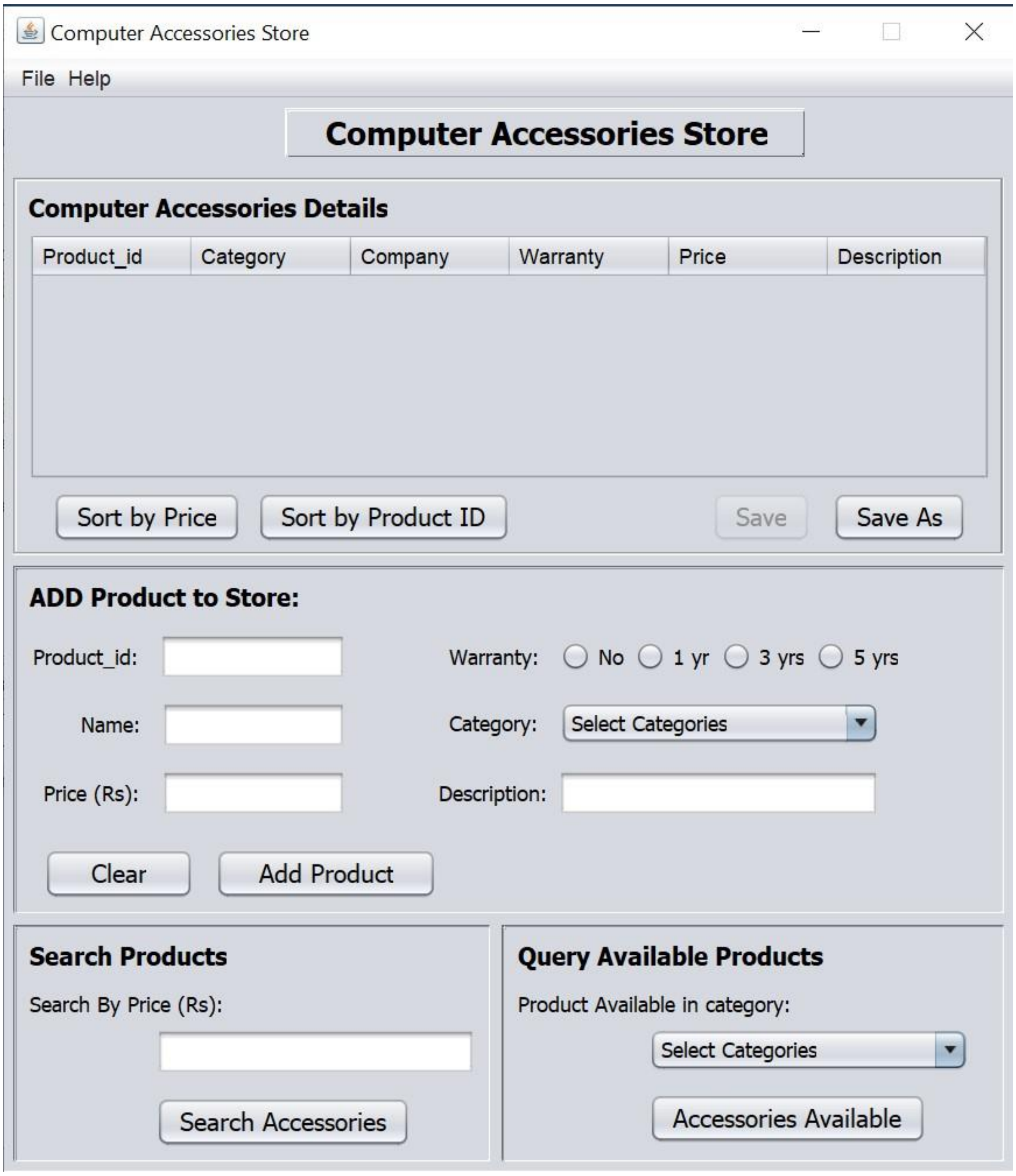
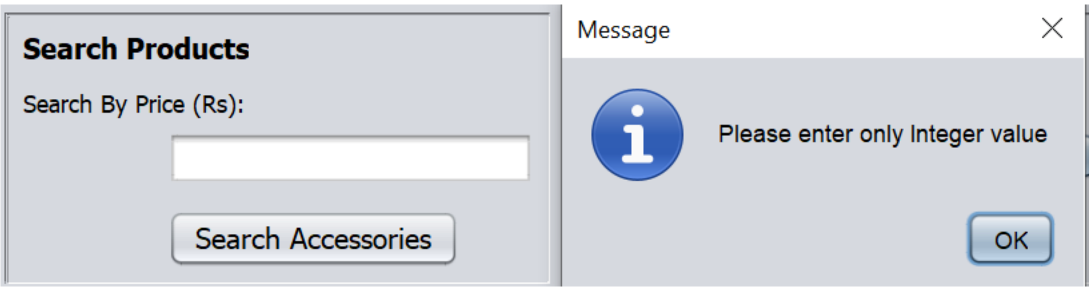


Figure 4: Screenshot of GUI of the system

After the development of wireframe, GUI is designed on NetBeans by dragging and dropping, positioning size and place of required palette. All the buttons, textfields, check box, combo box are arranged in required JPanel and GUI is developed as per the wireframe.

Coding part to accept only integer value by TextField



Please enter only Integer value

Figure 5: Screenshot of message box and JPanel of search product while trying to insert character

The textfield of search by price (Rs) needs to be developed in such a way that it does not accept characters and only integer value can be inserted. So, as per the need coding was done and if there is an attempt to insert other value than integer, the message box will be appear with a message “Please enter only Integer value”.

File Menu

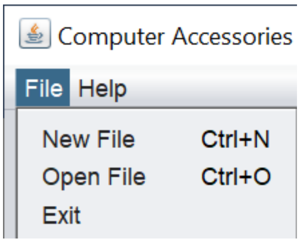
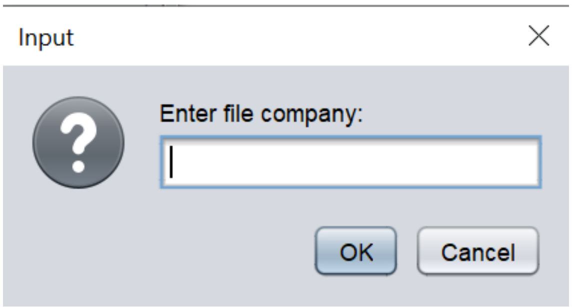


Figure 6: Screenshot of File Menu

File Menu has three files:

i. New File: It generates new file which do not contain any data inside JTable and can be used for inserting data into new file.

ii. Open File: When open file is pressed, dialogue box generates and ask user to input name of file and after inserting name of file and pressing OK button, data opens inside JTable.

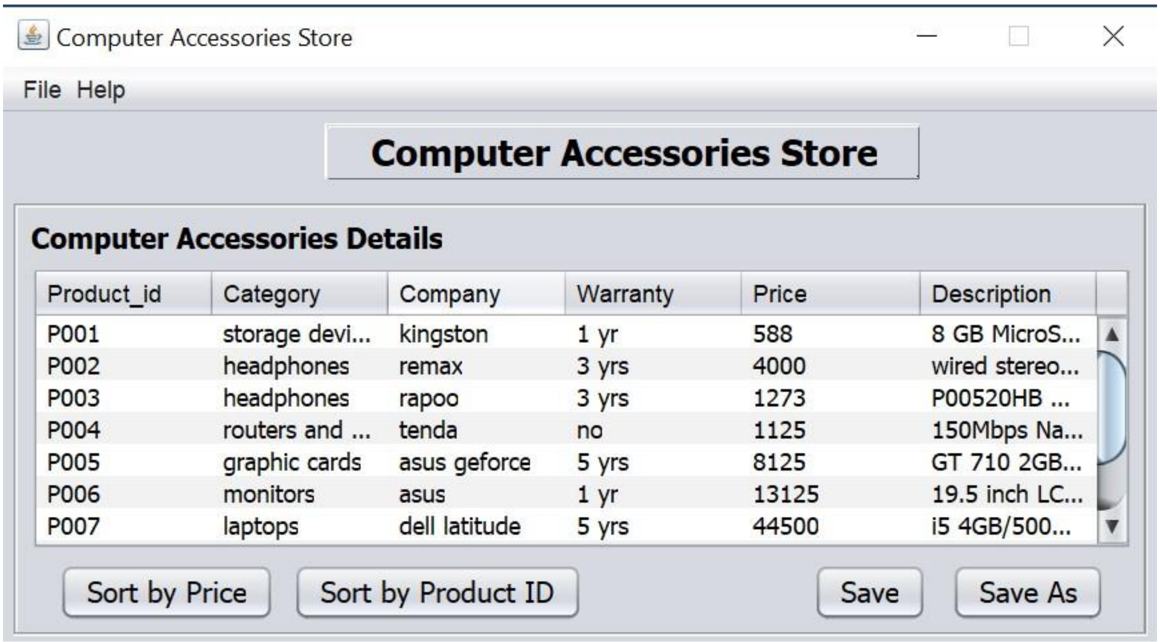


Enter file company:

Figure 7: Dialogue box to open existing file

iii. Exit: When we want to close the frame after the completion of work, pressing of Exit file closes the system.

JTable Part of System

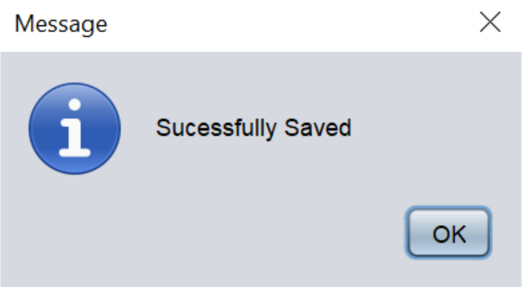

Computer Accessories Store
File Help
Computer Accessories Store
Computer Accessories Details

Product_id	Category	Company	Warranty	Price	Description
P001	storage devi...	kingston	1 yr	588	8 GB MicroS...
P002	headphones	remax	3 yrs	4000	wired stereo...
P003	headphones	rapoo	3 yrs	1273	P00520HB ...
P004	routers and ...	tenda	no	1125	150Mbps Na...
P005	graphic cards	asus geforce	5 yrs	8125	GT 710 2GB...
P006	monitors	asus	1 yr	13125	19.5 inch LC...
P007	laptops	dell latitude	5 yrs	44500	i5 4GB/500...

Figure 8: : Screenshot of Computer Accessories Details JPanel

This part consists of table in which columns of product_id, category, company, warranty, price and description which contain its related data and information. These data and information can be manually inserted from Add Product to store JPanel. It also contains Sort by Price and Sort by Product ID buttons which arranged the data inside the table in ascending order according to data inside price and according to Product_id respectively. There are also save and save as buttons to save data inside existing file and new file respectively.

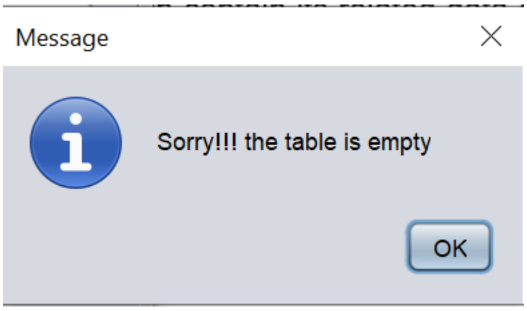
When we click on button Save, if data are saved message box will appear showing message "Successfully Saved" as below:



Sucessfully Saved

Figure 9: Screenshot of message box when Save button is clicked

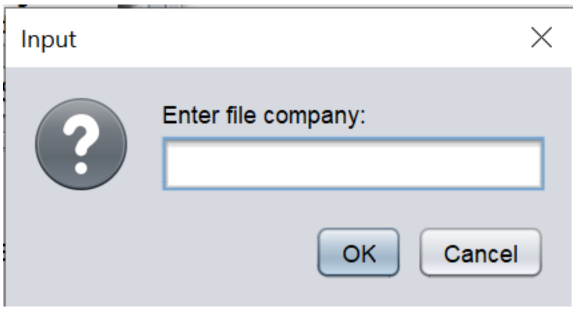
When we click on button Save As, if there is no data inside the table message box will appear showing message "Sorry!!! The table is empty" as below:



Sorry!!! the table is empty

Figure 10: Screenshot of message box when Save As button is clicked and there is no data inside table

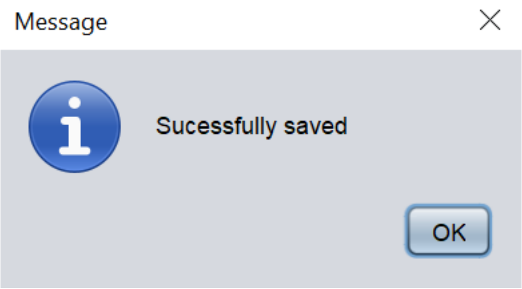
When we click on button Save As, if there are data inside the table dialogue box will appear showing message “Enter file Company” as below:



Enter file company:

Figure 11: Screenshot of dailogue box when Save As button is clicked to save data inside new file

And after inserting name of file inside textfield and click on button OK, if data save inside the file with inserted name, a message box will appear showing message “Successfully saved” as below:



Sucessfully saved

Figure 12: Screenshot of message box when data saved inside new file

Query Available Products part of system

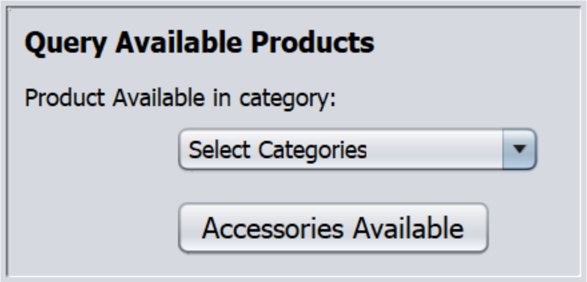
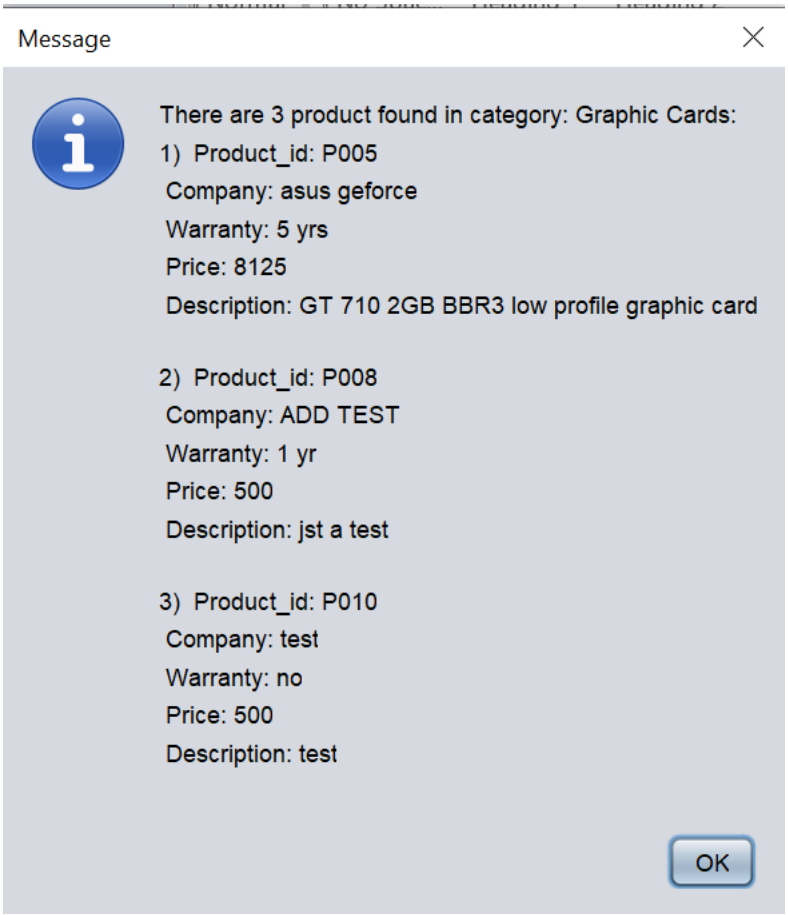


Figure 13: Screenshot of Query Available Products JPanel

When we require information regarding any category, we select that category from the combo box and click on Accessories Available button which generates information regarding that category as below:



There are 3 product found in category: Graphic Cards:

1) Product_id: P005
Company: asus geforce
Warranty: 5 yrs
Price: 8125
Description: GT 710 2GB BBR3 low profile graphic card

2) Product_id: P008
Company: ADD TEST
Warranty: 1 yr
Price: 500
Description: jst a test

3) Product_id: P010
Company: test
Warranty: no
Price: 500
Description: test

Figure 14: Dialogue box showing information according to Graphic Cards category

Adding data to the JTable by inserting and choosing through and from textfield, check box and combo box

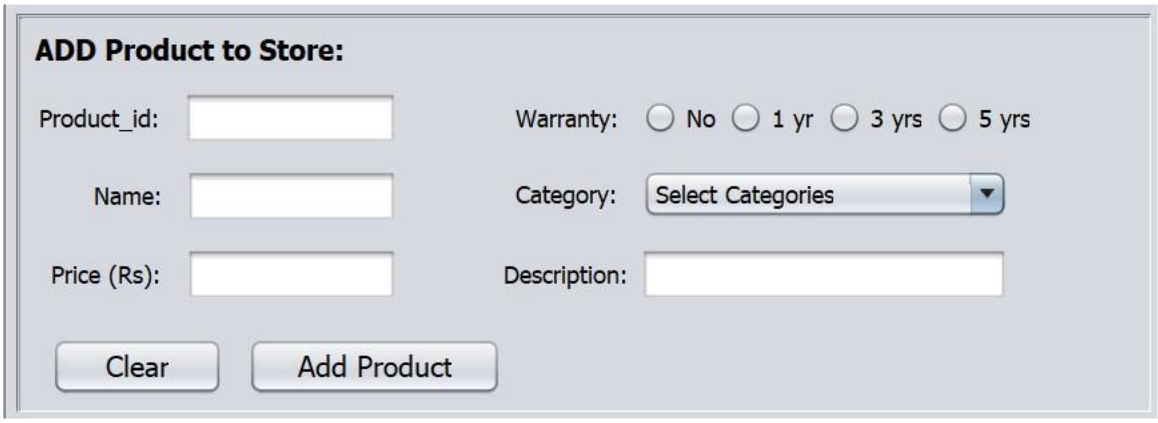
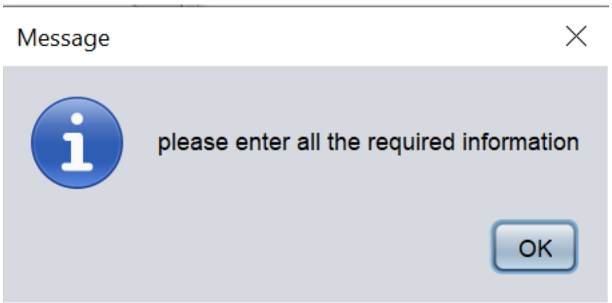


Figure 15: Screenshot of Add Product to Store JPanel

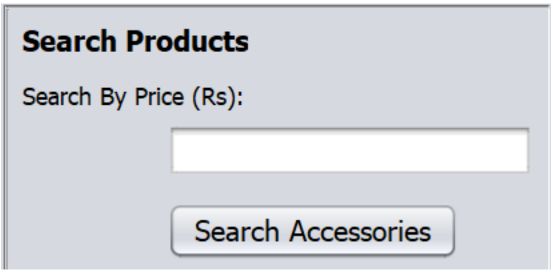
From this section, we can insert and choose data related to corresponding label and can be added inside the Jtable inside the “Computer Accessories Details” JPanel. To add inserted data inside the table, there is a button called Add Product and after clicking that button, data will be appear inside the table of “Computer Accessories Details” JPanel. And to remove inserted data after adding, there is a clear button to clear all the inserting data inside the textfield, check box and combo box. And if we press Add Button without fulfilling all required information, message box will appear notifying user with message “please enter all the required information”.



please enter all the required information

Figure 16: Screenshot of message box when all required information are not inserted

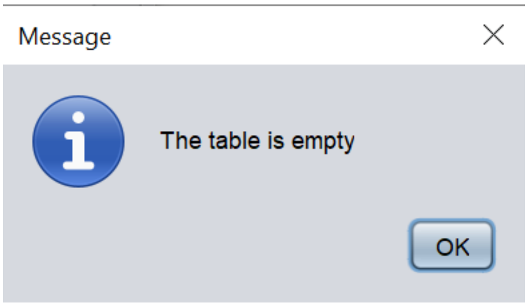
Searching Product through price



Search Products

Figure 17: Screenshot of Search Product JPanel

When we need to search data of product by price (Rs), we insert price of that product and press "Search Accessories" button which shows information regarding that product using binary search algorithm. And if search without any data inside table, message box appears with message "The table is empty" as below:

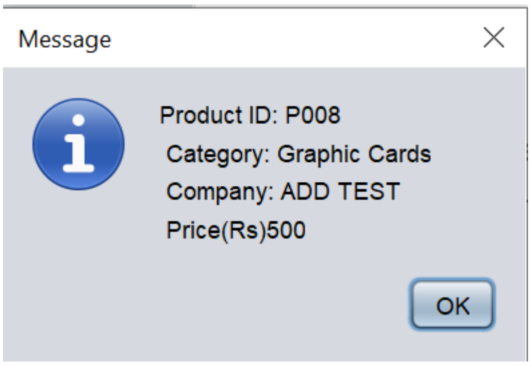


Message

The table is empty

Figure 18: Screenshot of message box when table is empty

And if there is item with that price, information regarding that product appears inside message box as below:

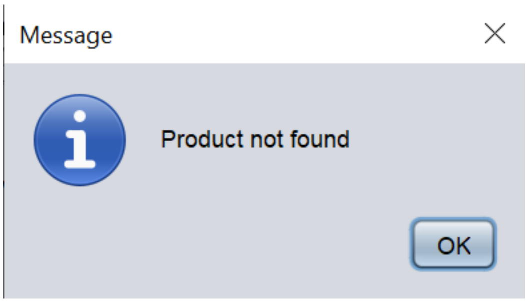


Message

Product ID: P008
Category: Graphic Cards
Company: ADD TEST
Price(Rs)500

Figure 19: Screenshot of message box showing information of product according to price

And if there is no product according to inserted price, message box with message "Product not found" as below:



Message

Product not found

Figure 20: Screenshot of message box when there is no product of that price

Help Menu

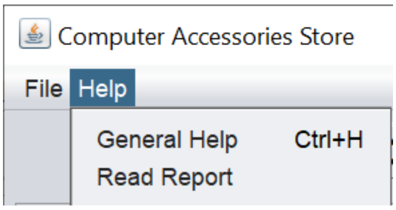


Figure 21: Screenshot of Help Menu

There are two files inside the Help Menu:

i. General Help: When we press this file or press Ctrl + H, pdf will be opened containing user manual explaining the system and how to use the system.

ii. Read Report: When we press this file, a documentation of this system will be generated.

Note: Although part of system, development, testing and report part is divided to each individual and mentioned as their only own responsibilities, each person gave equal participation and effort in this assignment.

Introduction

In this group coursework we are required to propose and develop a GUI based Information System and as per the requirement, our proposal was on “Computer Accessories Store Application” which was submitted in classroom. After that submission, we proceed to develop an Information System and document a report of that Information System.

According to the requirement of given assignment, we have to develop a Java based Menu Information System with a project named CAD_IS containing a class called CAD_Info. And that system should have a table with its title “Computer Accessories Store Details” for storing and displaying the computer accessories items. The menu items must contain at least radio buttons for range level(for example low, medium, high), Check boxes or Combo box for selecting categories, Text fields for insertion of value and displaying output and the table with minimum 5 categories and 12 items in our demonstration. We are also required to insert a simple menu bar with at least file menu consisting of Open File for opening an existing file and Exit file for closing the system and help menu consisting of Help File for displaying user manual for the user. The system should also provide functionality for searching items based on price and if there are two or more items with same price, only the first matching item should be displayed in a JOptionPane ,message box in the system. And if there is no item with that price list, system should display a JOptionPane message box which shows a message to say that there is no item according to the inserted price list. The search method should be implemented based on the binary search algorithm. The system must contain a text field for entering search criteria (price of item) and search button named “Search accessories” to search items stored in the system. We are also required to implement a function for querying how many dishes are available in a category. For this function, either a Combo Box or Check boxes should be implemented to provide the search criteria and a button named “accessory available in category” for searching. The search result should be displayed meaningfully in a JOptionPane message box for the available accessories.

After the completion of developing an Information System, we are also required to document report of that System. In the report, we need to describe the process of developing the system with description of binary search algorithm used for searching the price in detail using a diagram to demonstrate algorithm. The report also contain description of each method we created in the MenuInfo class and the testing of our program including screenshots to show running results for adding item details to table, searching item in table based on price, searching for number of dishes in a category and opening a file from menu. Screenshots of evidence of system validation with pop up of appropriate dialog boxes when system's functions executes without value or system's functions executes with inappropriate value. It should also contain the responsibilities taken by each individual for completion of assignment inside Individual Tasks section, description of requirements inside Individual section and evaluation of work with reflection of knowledge we received from this assignment, difficulties and problems we went through with ways we came across through them inside Conclusion section.

Body:

Process of developing the system:

Binary search algorithm:

Binary search algorithm is the most popular and most used algorithm to search any values in the list of many values. Binary search is only applicable for the sorted set of elements. In order to search an element in a list of elements using binary search, the list of elements must be in curtain order.

The basic principle of the binary search is to assume the middle value of the sorted list as our desire element. If our assumption is wrong than, we again assume the middle value of other half part of the sorted list as our desire element. This process is repeated until the desire element is found. This search algorithm is very beneficial to us as a programmer since it reduces the time, effort and space of the processor. (hackerearth, 2019)

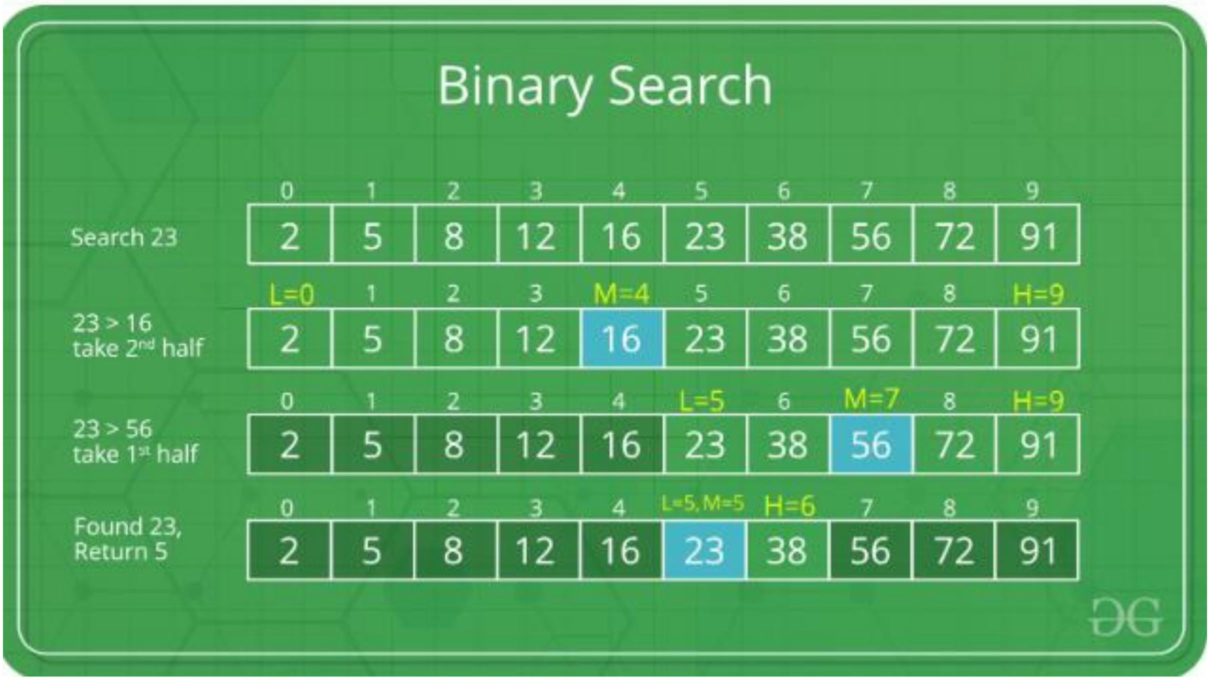


Figure 22: Binary Search example (GeeksforGeeks, 2018)

The figure given above is an example of the binary search algorithm. Let us suppose our desire element is 23 and it is to be search in the ascendingly sorted list [2, 5, 8, 12, 16, 23, 38, 56, 72, 91].

For the 1st loop, we know that the lowest index is 0 and the highest index of the list is 9. Therefore, the mid index of the list is (0+9)/2 = 4. Hence the middle value of the sorted list is stored in index number 4. Now, we assume that the value of index 4 is our desire element. But, the value in the index 4 is 16.

We then now compare 16 with our desire element i.e. 23. Since 23 is greater than 16, we take the right-side part of the sorted list i.e. [23, 38, 56, 72, 91].

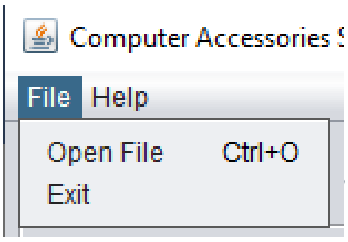
Now the lowest index is 5 and highest is 9. The middle index is 7 whose value is 56. This is now greater than 23, so we again take the left-side part of the sorted list i.e. [23, 38]. We reaped this process until the desire element is found. Here, now the lowest index is 5 and highest is 6. Therefore, the mid index is 5 which stores the value 23 which is our required element. Hence, the required element is found on 3rd loop using binary search algorithm.

Here in this program, we have used binary search algorithm for searching the product available in the computer accessories store in base of the price provided by the user.

Description of the methods created in this class

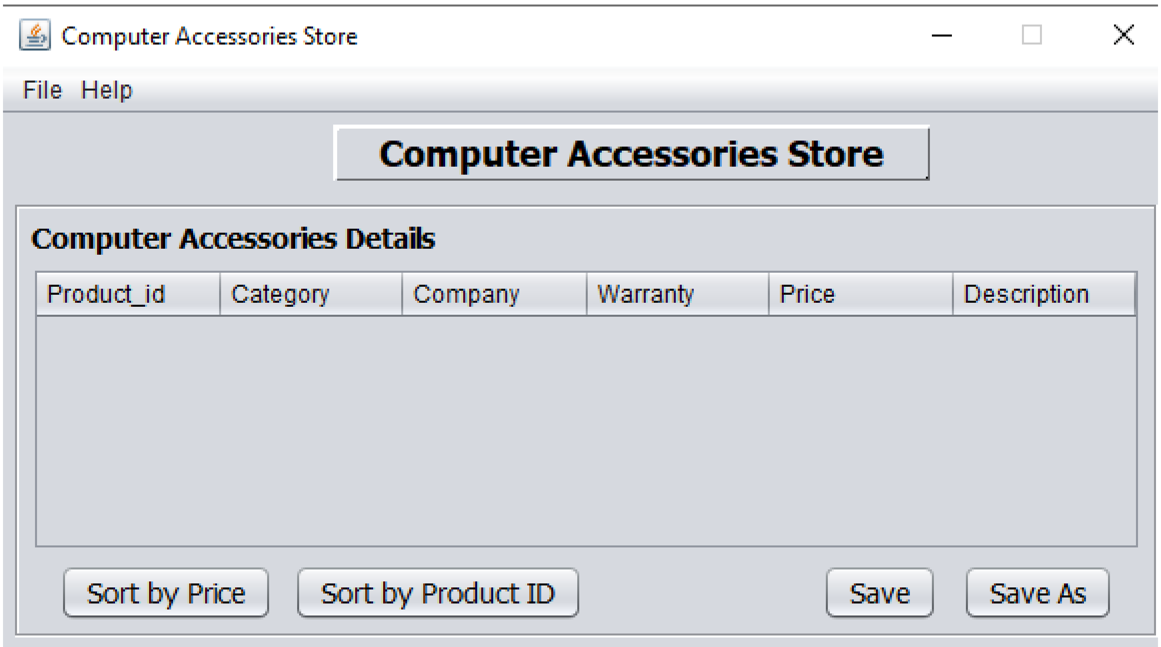
1) **private void openMenuItemActionPerformed(java.awt.event.ActionEvent evt)**

This is an action performed method that runs when the openMeanuItem button is clicked. It can also be execute by clicking the shortcut key “Ctrl + O”.



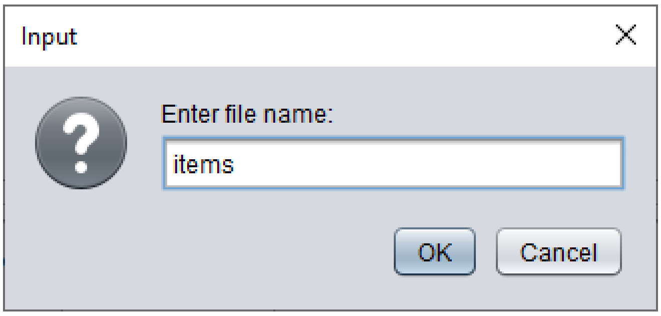
When this button is clicked, the program asked the user to enter the name of the .txt file where all the items available in the computer accessories are stored seperated by commas.

After asking the name from the user, this methods reads all the text written in the txt files line by line and it stores all the datas in jTable1.


Computer Accessories Store
File
Help
Computer Accessories Store
Computer Accessories Details
Sort by Price
Sort by Product ID
Save
Save As

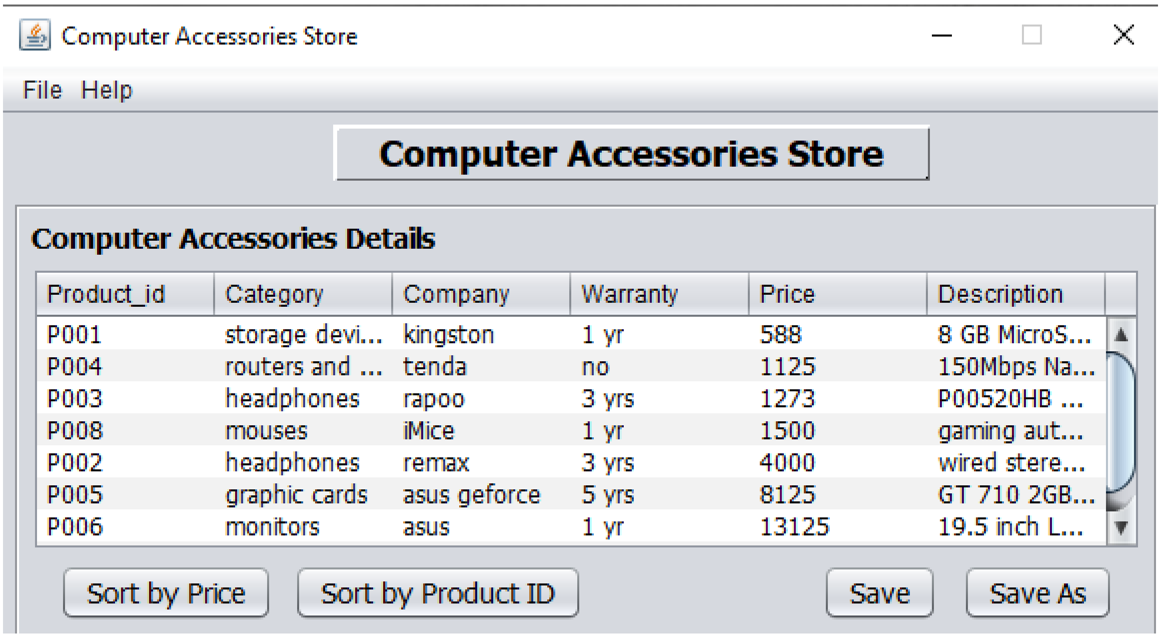
Product_id	Category	Company	Warranty	Price	Description

Figure 24: JTable before opening any file



Enter file name: items

Figure 25: program asking user to enter the file name


Computer Accessories Store
File
Help
Computer Accessories Store
Computer Accessories Details
Sort by Price
Sort by Product ID
Save
Save As

Product_id	Category	Company	Warranty	Price	Description
P001	storage devi...	kingston	1 yr	588	8 GB MicroS...
P004	routers and ...	tenda	no	1125	150Mbps Na...
P003	headphones	rapoo	3 yrs	1273	P00520HB ...
P008	mouses	iMice	1 yr	1500	gaming aut...
P002	headphones	remax	3 yrs	4000	wired stere...
P005	graphic cards	asus geforce	5 yrs	8125	GT 710 2GB...
P006	monitors	asus	1 yr	13125	19.5 inch L...

Figure 26: jtable after opeaning the file

2) private void btnClearActionPerformed(java.awt.event.ActionEvent evt):

This is an action performed method that runs when the btnClear button is clicked.

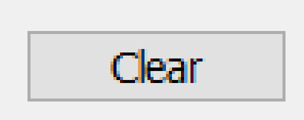
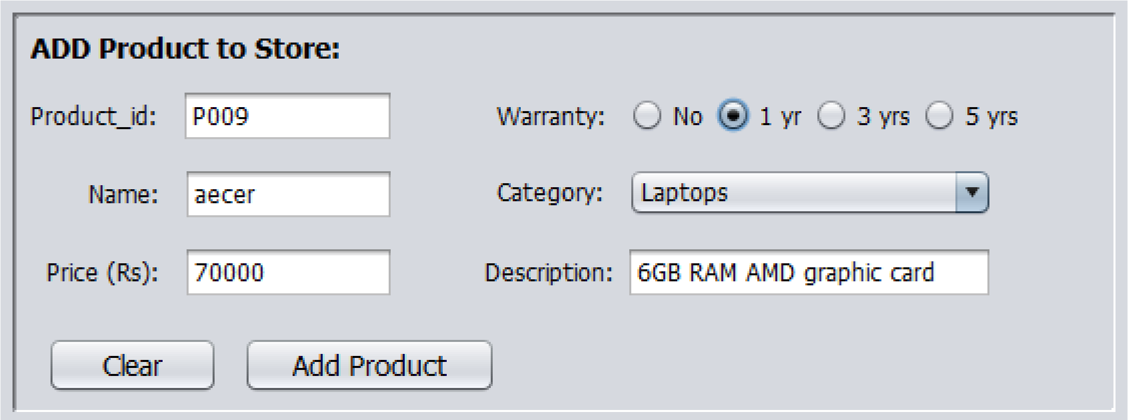


Figure 27: btnClear

When this method runs, all the text filed displayed to add the product in the table becomes empty. All the buttons of the radio button are unselected. Clicking this button, it also resets the value selected in the combobox and set it to “Select Categories” as shown in the figure below:



ADD Product to Store:

Product_id: P009

Name: aecer

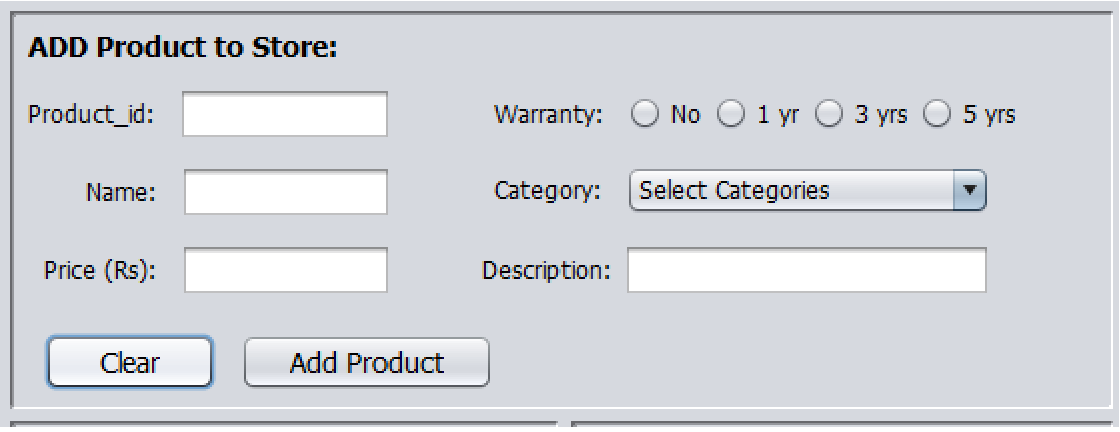
Price (Rs): 70000

Warranty: ○ No ● 1 yr ○ 3 yrs ○ 5 yrs

Category: Laptops

Description: 6GB RAM AMD graphic card

Figure 28: Add product panel before clicking btnClear



ADD Product to Store:

Product_id:

Name:

Price (Rs):

Warranty: ○ No ○ 1 yr ○ 3 yrs ○ 5 yrs

Category: Select Categories

Description:

Figure 29: Add product panel after clicking btnClear

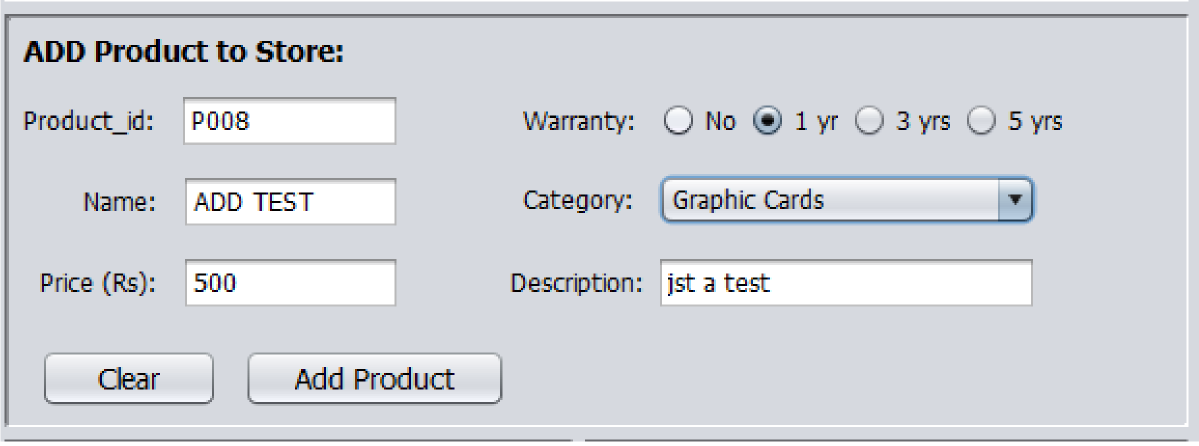
3) private void btnAddProductActionPerformed(java.awt.event.ActionEvent evt)

Figure 30: btnAddProduct

This is an action performed method that runs when the btnAddProduct button is clicked.

When this method runs, it reads all the text fields from then panel and stores it in the respective variables. It also reads the data selected in the radio button and the combo box and store it to the respective variable.

After storing all the required data to the respective variables, this method adds all those data in the JTabel1 where all the products available in the computer accessories store are displayed.



ADD Product to Store:

Product_id: P008

Name: ADD TEST

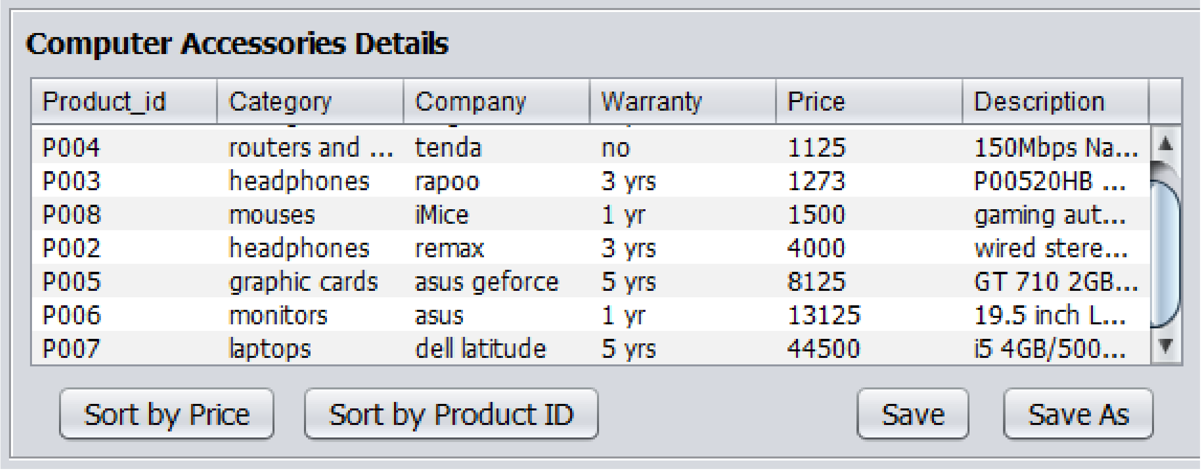
Price (Rs): 500

Warranty: ○ No ● 1 yr ○ 3 yrs ○ 5 yrs

Category: Graphic Cards

Description: jst a test

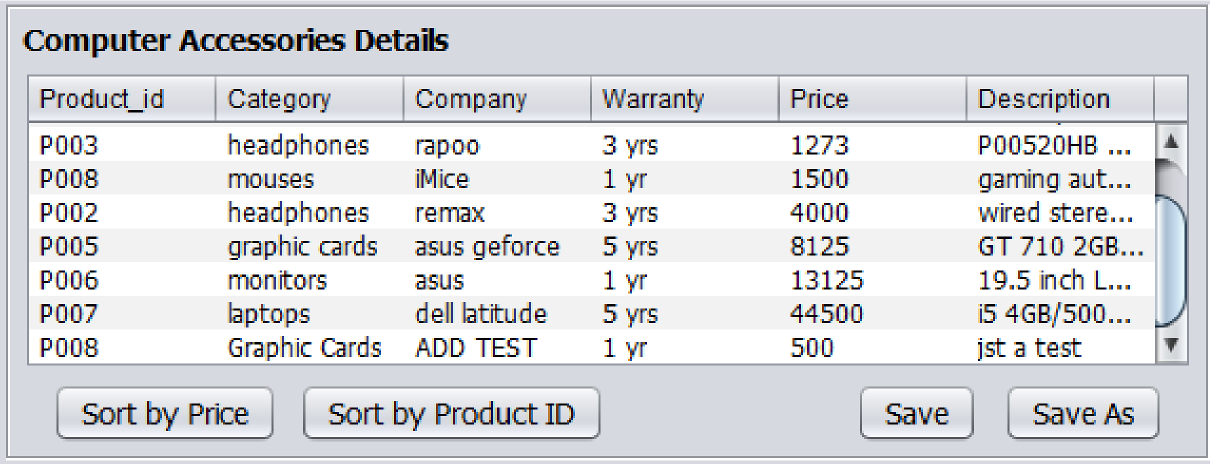
Figure 31: value to test add button



Computer Accessories Details

Product_id	Category	Company	Warranty	Price	Description
P004	routers and ...	tenda	no	1125	150Mbps Na...
P003	headphones	rapoo	3 yrs	1273	P00520HB ...
P008	mouses	iMice	1 yr	1500	gaming aut...
P002	headphones	remax	3 yrs	4000	wired stere...
P005	graphic cards	asus geforce	5 yrs	8125	GT 710 2GB...
P006	monitors	asus	1 yr	13125	19.5 inch L...
P007	laptops	dell latitude	5 yrs	44500	i5 4GB/500...

Figure 32: jTable before adding product



Product_id	Category	Company	Warranty	Price	Description
P003	headphones	rapoo	3 yrs	1273	P00520HB ...
P008	mouses	iMice	1 yr	1500	gaming aut...
P002	headphones	remax	3 yrs	4000	wired stere...
P005	graphic cards	asus geforce	5 yrs	8125	GT 710 2GB...
P006	monitors	asus	1 yr	13125	19.5 inch L...
P007	laptops	dell latitude	5 yrs	44500	i5 4GB/500...
P008	Graphic Cards	ADD TEST	1 yr	500	jst a test

Figure 33: jTable after adding product

4) private void btnSortByPriceActionPerformed(java.awt.event.ActionEvent evt)

This is an action performed method that runs when the btnSortByPriceActionPerformed button is clicked.

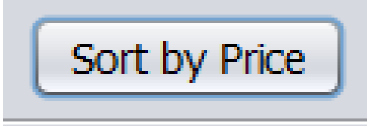
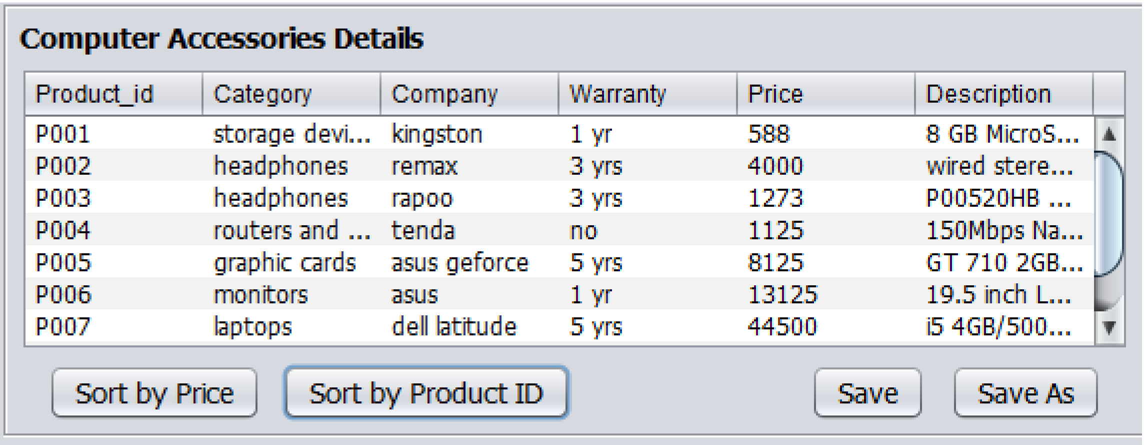


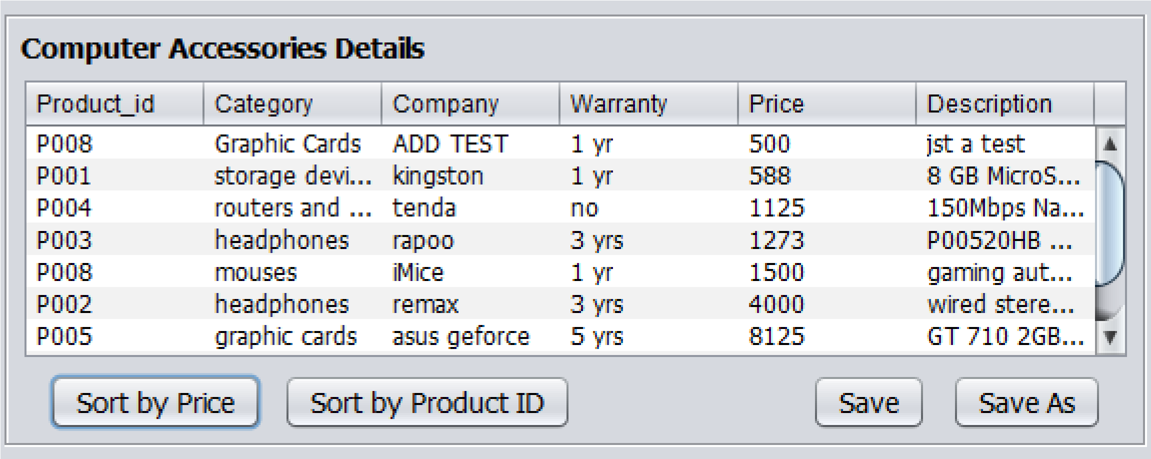
Figure 34: btnSortByPrice

When this method runs, it reads all the values from jTable and arrange it in ascending order according to the value of price.



Product_id	Category	Company	Warranty	Price	Description
P001	storage devi...	kingston	1 yr	588	8 GB MicroS...
P002	headphones	remax	3 yrs	4000	wired stere...
P003	headphones	rapoo	3 yrs	1273	P00520HB ...
P004	routers and ...	tenda	no	1125	150Mbps Na...
P005	graphic cards	asus geforce	5 yrs	8125	GT 710 2GB...
P006	monitors	asus	1 yr	13125	19.5 inch L...
P007	laptops	dell latitude	5 yrs	44500	i5 4GB/500...

Figure 35: before sorting by price



Computer Accessories Details

Product_id	Category	Company	Warranty	Price	Description
P008	Graphic Cards	ADD TEST	1 yr	500	jst a test
P001	storage devi...	kingston	1 yr	588	8 GB MicroS...
P004	routers and ...	tenda	no	1125	150Mbps Na...
P003	headphones	rapoo	3 yrs	1273	P00520HB ...
P008	mouses	iMice	1 yr	1500	gaming aut...
P002	headphones	remax	3 yrs	4000	wired stere...
P005	graphic cards	asus geforce	5 yrs	8125	GT 710 2GB...

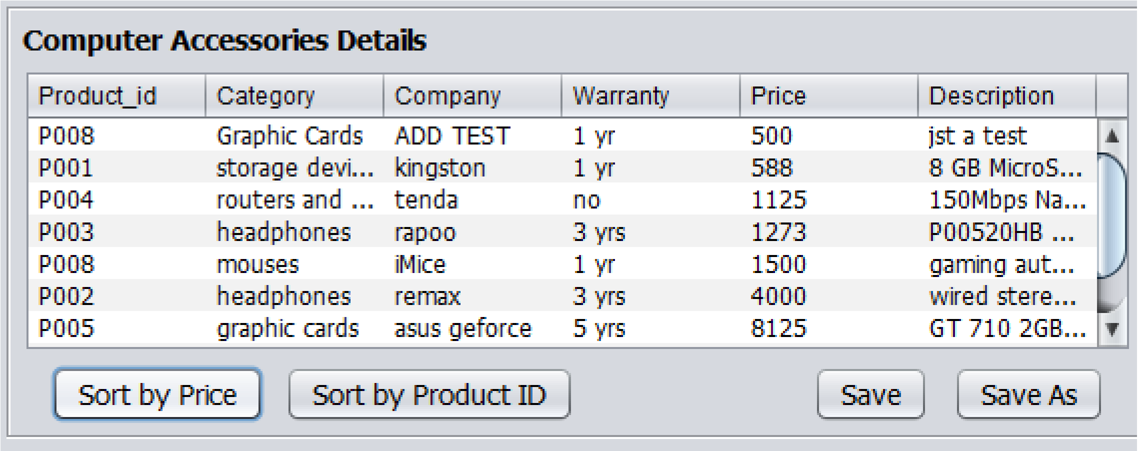
Figure 36: after sorting by price

5) private void btnSortByIDActionPerformed(java.awt.event.ActionEvent evt)

Figure 37: btnSortByProductID

This is an action performed method that runs when the btnSortByIDActionPerformed button is clicked.

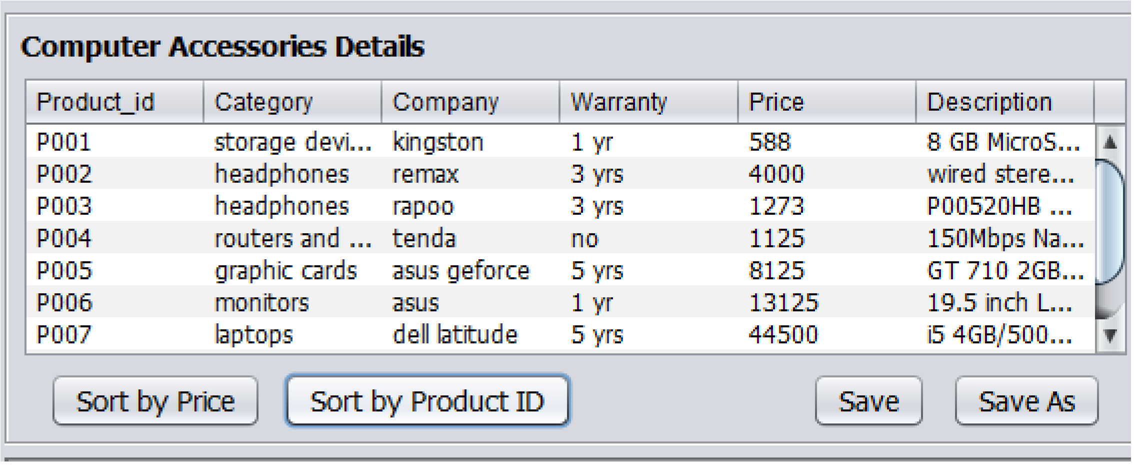
When this method runs, it reads all the values from jTable and arrange it in ascending order according to the value of product ID.



Computer Accessories Details

Product_id	Category	Company	Warranty	Price	Description
P008	Graphic Cards	ADD TEST	1 yr	500	jst a test
P001	storage devi...	kingston	1 yr	588	8 GB MicroS...
P004	routers and ...	tenda	no	1125	150Mbps Na...
P003	headphones	rapoo	3 yrs	1273	P00520HB ...
P008	mouses	iMice	1 yr	1500	gaming aut...
P002	headphones	remax	3 yrs	4000	wired stere...
P005	graphic cards	asus geforce	5 yrs	8125	GT 710 2GB...

Figure 38: before sorting by product ID



Computer Accessories Details

Product_id	Category	Company	Warranty	Price	Description
P001	storage devi...	kingston	1 yr	588	8 GB MicroS...
P002	headphones	remax	3 yrs	4000	wired stere...
P003	headphones	rapoo	3 yrs	1273	P00520HB ...
P004	routers and ...	tenda	no	1125	150Mbps Na...
P005	graphic cards	asus geforce	5 yrs	8125	GT 710 2GB...
P006	monitors	asus	1 yr	13125	19.5 inch L...
P007	laptops	dell latitude	5 yrs	44500	i5 4GB/500...

Figure 39: after sorting by product ID

6) private void btnSaveActionPerformed(java.awt.event.ActionEvent evt)

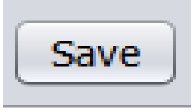


Figure 40: btnSave

This is an action performed method that runs when the user clicks btnSave button. Then main function of this button is to save all the data of the jTable in a text file.

When user click this method it first asks the user to enter the file name if the file name is not set already. Then if stores all the values of the table in a text file separating each row in different line and each column separated with comma.

7) private void btnSaveAsActionPerformed(java.awt.event.ActionEvent evt)

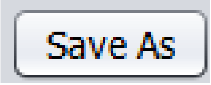


Figure 41: btnSaveAs

This is an action performed method that runs when the user clicks btnSaveAs button. The main function of this method is to store the values of the jTable in a new file.

It ask the user to enter the file name of the txt file where the user wants to store the data of the table. If the system already contains the file of the same name, the program ask the user wether they want to replace the file or not.

8) private void btnSearchActionPerformed(java.awt.event.ActionEvent evt)

This is an action performed method that runs when the user clicks btnSearch button. The main function of this button is to search the table and display the details of required product to the user.

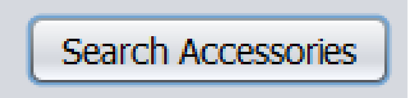
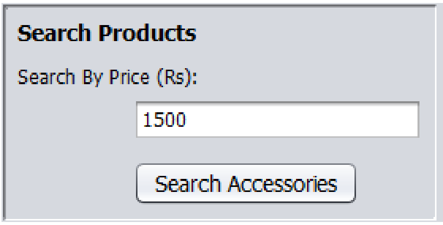


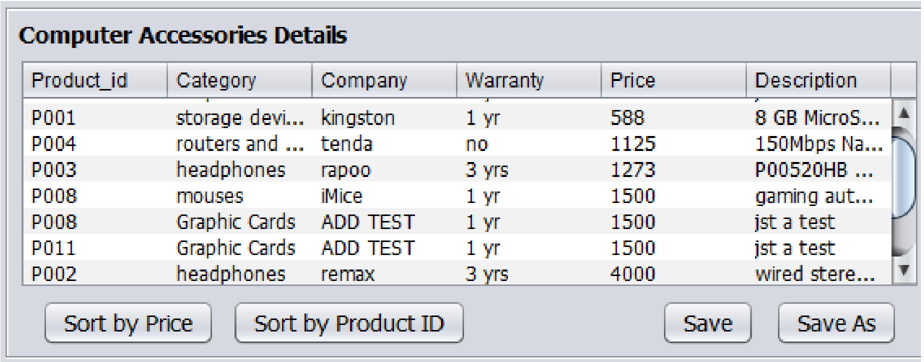
Figure 42: btnSearchAccessories

First of all, this method asks the price of the product that the user want to search. Then after sorting the value of the tables in ascending order and using the binary search algorithm, this method search for the required data in the table. In there are multiple values in the table then the program only displays the 1st item that appears when sorting the values of the table in ascending order according to the price.


Search Products

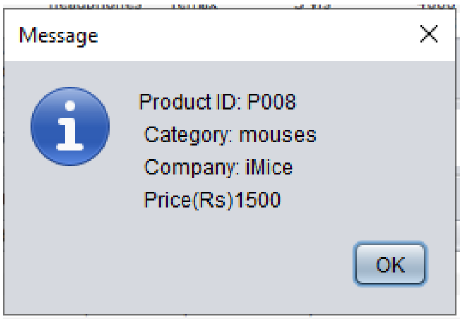
Search By Price (Rs): 1500

Figure 43: inserting price to search


Computer Accessories Details

Product_id	Category	Company	Warranty	Price	Description
P001	storage devi...	kingston	1 yr	588	8 GB MicroS...
P004	routers and ...	tenda	no	1125	150Mbps Na...
P003	headphones	rapoo	3 yrs	1273	P00520HB ...
P008	mouses	iMice	1 yr	1500	gaming aut...
P008	Graphic Cards	ADD TEST	1 yr	1500	jst a test
P011	Graphic Cards	ADD TEST	1 yr	1500	jst a test
P002	headphones	remax	3 yrs	4000	wired stere...

Figure 44: table after sorting


Message

Product ID: P008
Category: mouses
Company: iMice
Price(Rs)1500

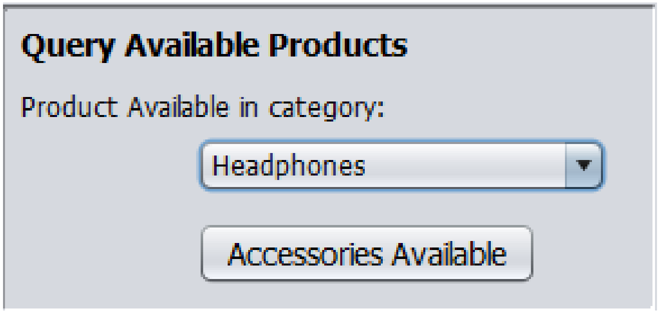
Figure 45: displaying 1st product of table after search using binary search

9) **private void btnAvailableActionPerformed(java.awt.event.ActionEvent evt)**

Figure 46: btnAvailable

This is an action performed method that runs when the user clicks btnAvailable. The main fuction of this function is to search the table and display all the product available in the table based on the category choose by the user.

First it read the value of the combo box where the user has chosen the category of the product. Then using the linear search algorithm, this method searches all the matching product in the table and displays the result to the user.

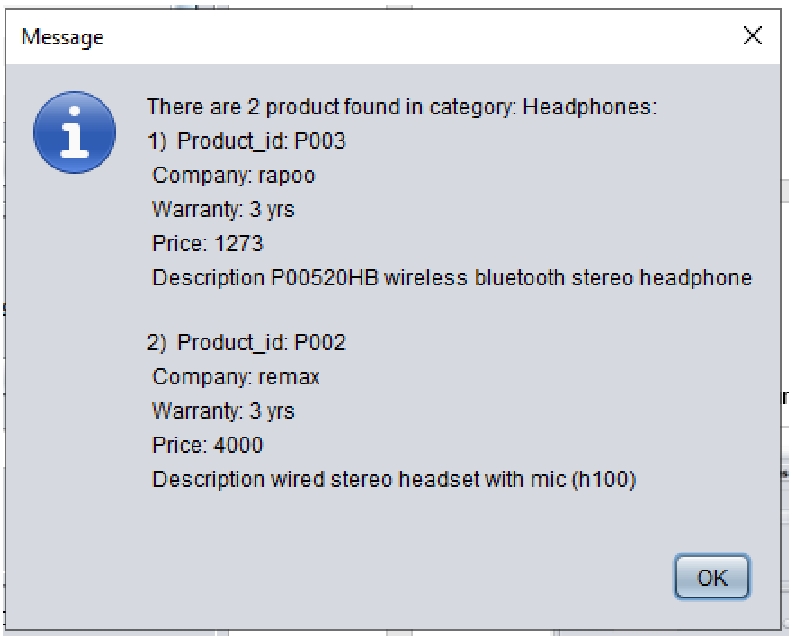


Query Available Products

Product Available in category:

Headphones

Figure 47: process to inquiry accessories available



```
Message

There are 2 product found in category: Headphones:
1) Product_id: P003
 Company: rapoo
 Warranty: 3 yrs
 Price: 1273
 Description P00520HB wireless bluetooth stereo headphone

2) Product_id: P002
 Company: remax
 Warranty: 3 yrs
 Price: 4000
 Description wired stereo headset with mic (h100)
```

Figure 48: displaying the result using linear search

10) private void jMenuNewActionPerformed(java.awt.event.ActionEvent evt)

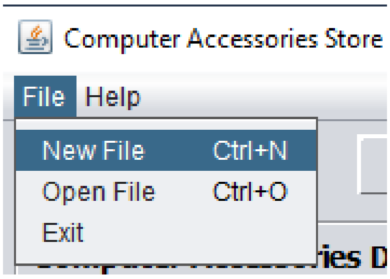
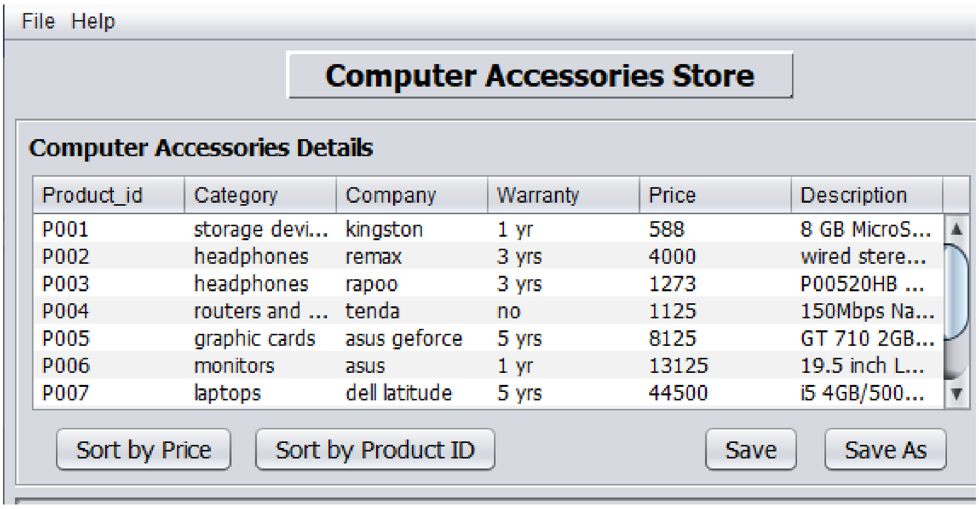


Figure 49: jMenuNew

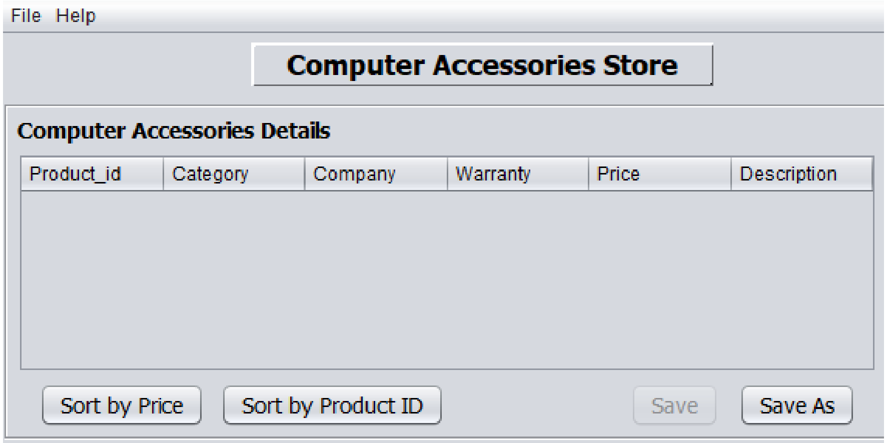
This is an action performed method that runs when the user clicks jMenuNew button. The main function of this method is to open a new file that has no ani previously set file name and no any contains in the table.

When this button is clicked, it removes all the data of that table if it contains data. It also set the file name to “” since it is now a new file. It also disables the btnSave button.



Product_id	Category	Company	Warranty	Price	Description
P001	storage devi...	kingston	1 yr	588	8 GB MicroS...
P002	headphones	remax	3 yrs	4000	wired stere...
P003	headphones	rapoo	3 yrs	1273	P00520HB ...
P004	routers and ...	tenda	no	1125	150Mbps Na...
P005	graphic cards	asus geforce	5 yrs	8125	GT 710 2GB...
P006	monitors	asus	1 yr	13125	19.5 inch L...
P007	laptops	dell latitude	5 yrs	44500	i5 4GB/500...

Figure 50: table before clicking jMenuNew



Product_id	Category	Company	Warranty	Price	Description

Figure 51: Table after clicking New

11) private void jMenuReportActionPerformed(java.awt.event.ActionEvent evt)

This is an action performed method that runs when the user clicks jMenuReport button. The main function of this button is to open a pdf file that contains the report of creating this coursework.

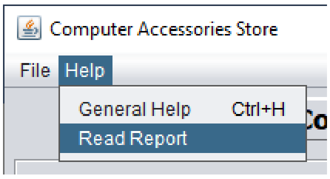
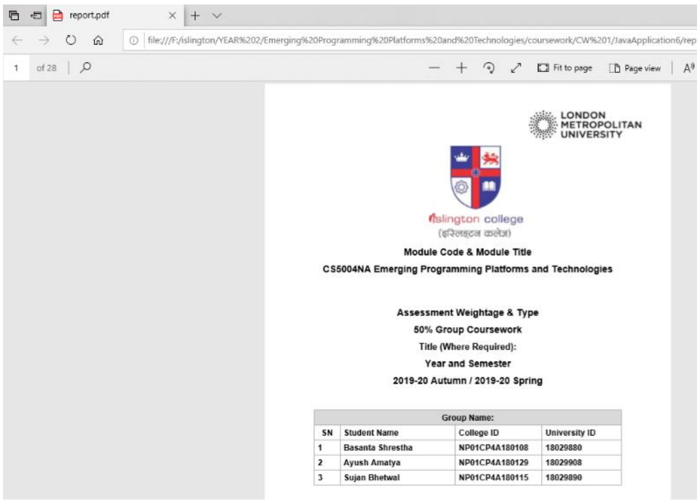


Figure 52: jMenuReport


report.pdf
file:///F:/islington/YEAR%202/Emerging%20Programming%20Platforms%20and%20Technologies/coursework/CW%201/JavaApplication6/rep
1
of 28
Fit to page
Page view
LONDON METROPOLITAN UNIVERSITY
islington college
(इस्लिङ्टन कलेज)

Module Code & Module Title

CS5004NA Emerging Programming Platforms and Technologies

Assessment Weightage & Type

50% Group Coursework

Title (Where Required):

Year and Semester

2019-20 Autumn / 2019-20 Spring

Group Name:			
SN	Student Name	College ID	University ID
1	Basanta Shrestha	NP01CP4A180108	18029880
2	Ayush Amatya	NP01CP4A180129	18029908
3	Sujan Bhetwal	NP01CP4A180115	18029890

Figure 53: Report generated

12) private void jMenuHelpActionPerformed(java.awt.event.ActionEvent evt)

This is an action performed method that runs when the user clicks jMenuHelp button. The main function of this button is to open pdf file that contains the guidelines about how the program runs.

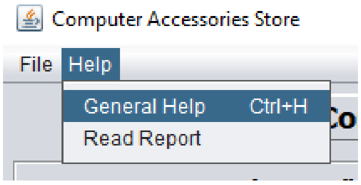
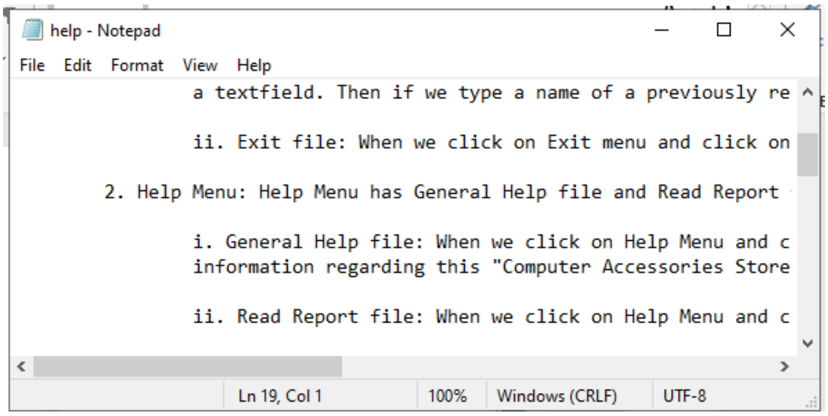


Figure 54: jMenuHelp



```
                a textfield. Then if we type a name of a previously re

                ii. Exit file: When we click on Exit menu and click on

        2. Help Menu: Help Menu has General Help file and Read Report

                i. General Help file: When we click on Help Menu and c
                information regarding this "Computer Accessories Store

                ii. Read Report file: When we click on Help Menu and c
```

Figure 55: Help pdf generated

13) private void jMenuExitActionPerformed(java.awt.event.ActionEvent evt)

This is an action performed method that runs when the user clicks jMenuExit button. The main function of this button is to close the program sucessfully.

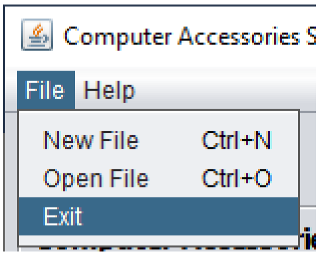
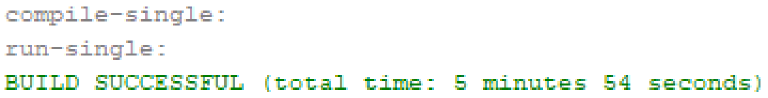


Figure 56: jMenuExit

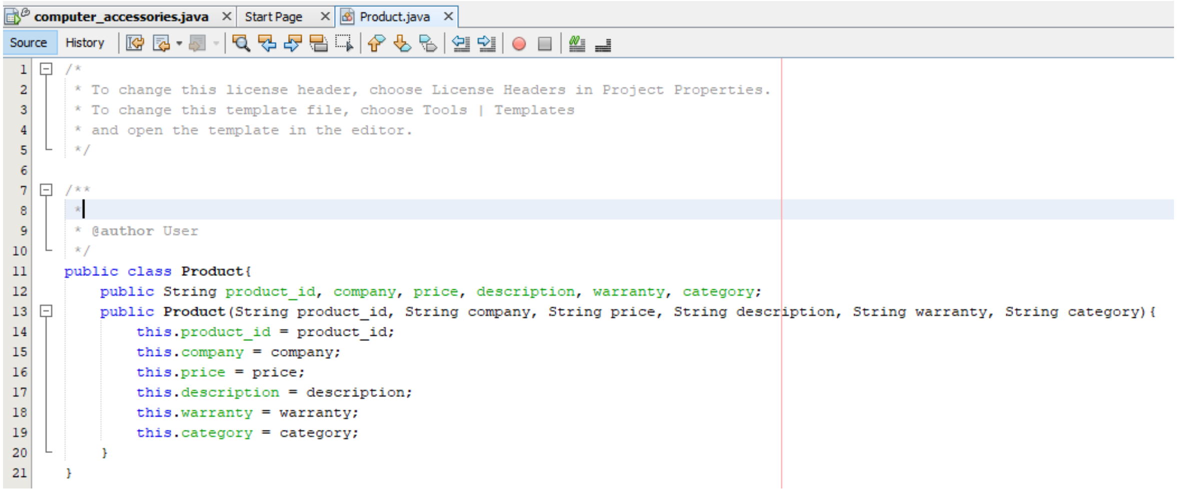


```
compile-single:
run-single:
BUILD SUCCESSFUL (total time: 5 minutes 54 seconds)
```

Figure 57: successfully exited

14) Public class Product:

This is the class created inside the project Coursework1. In this class, the variables that are required to store in the table are created and the values of those rows are passed to the respective variable. This this coursework, this class is used to make the programmer easier to work on the variables. Every new product added by the user are stores as an object of this class. This makes the user to work with the data provided by the user.



```
/*
 * To change this license header, choose License Headers in Project Properties.
 * To change this template file, choose Tools | Templates
 * and open the template in the editor.
 */

/**
 *
 * @author User
 */
public class Product{
    public String product_id, company, price, description, warranty, category;
    public Product(String product_id, String company, String price, String description, String warranty, String category){
        this.product_id = product_id;
        this.company = company;
        this.price = price;
        this.description = description;
        this.warranty = warranty;
        this.category = category;
    }
}
```

Figure 58: class Product

15) private void insertInTable(ArrayList<Product> arrayProduct)

This is the private void method. The main function of this method is to insert the value into the table. This method takes arrayProduct as a parameter. arrayProduct is the array list which stores the values (as an object of class Product) that are need to be stored in the table. Then it iterates all the values of the arrayProduct and stores each value to the JTable.

Called by: private void btnSearchActionPerformed(java.awt.event.ActionEvent evt)

private void btnAddProductActionPerformed(java.awt.event.ActionEvent evt)

private void btnSortByIDActionPerformed(java.awt.event.ActionEvent evt)

private void btnSortByPriceActionPerformed(java.awt.event.ActionEvent evt)

16) private void clearTable():

This is the private void method. The main function of this method is to clear all the values of the table. When this method is called the it clears all the values of the table.

Called by: private void jMenuNewActionPerformed(java.awt.event.ActionEvent evt)

private void btnAddProductActionPerformed(java.awt.event.ActionEvent evt)

private void openMenuItemActionPerformed(java.awt.event.ActionEvent evt)

private void btnSearchActionPerformed(java.awt.event.ActionEvent evt)

private void btnSortByIDActionPerformed(java.awt.event.ActionEvent evt

private void btnSortByPriceActionPerformed(java.awt.event.ActionEvent evt)

17) private void writeFile(ArrayList<Product> list, String file_name):

This is the private void method. The main function of this method is to write a file in a new txt file. This method takes list and file_name as a parameter. The list is array list that stores the values as an object of the class Product. The file_name is a string variable. When this method is called, it stores all the values of list in CSV(comma separated value) form to the new file named as file_name.

Called by: private void btnSaveActionPerformed(java.awt.event.ActionEvent evt)

private void btnSaveAsActionPerformed(java.awt.event.ActionEvent evt)

18) private void sortByPrice():

This is a private void method. The main function of this method is to sort the values of the table in ascending order according to the value of the price. All the codes that are required to sort the table according to the price are written in this method.

Called by: private void btnSearchActionPerformed(java.awt.event.ActionEvent evt)

private void btnSortByPriceActionPerformed(java.awt.event.ActionEvent evt)

Calls: static int minimumPositionIndex(ArrayList<Product> list,int from):

19) private void sortByProductID():

This is a private void method. The main function of this method is to sort the values of the table in ascending order according to the value of the productID. All the codes that are required to sort the table according to the productID are written in this method.

Called by: private void btnSortByIDActionPerformed(java.awt.event.ActionEvent evt)

Calls: private static int minimumPositionID(ArrayList<Product> list,int from)

20) private static int minimumPositionID(ArrayList<Product> list,int from):

This is a private static method. The main function of this method is to return the minimum position of the productID in the list. It takes list and from as a parameter. The data type of list is arraylist<Product> and form in int. It returns the integer value which is the minimum position of the item in the array list which has the minimum value of the productID.

Called by: private void sortByProductID()

21) private static int minimumPositionIndex(ArrayList<Product> list,int from):

This is a private static method. The main function of this method is to return the minimum position of the Price in the list. It takes list and from as a parameter. The data type of list is arraylist<Product> and form in int. It returns the integer value which is the minimum position of the item in the array list which has the minimum value of the price.

Called by: private void sortByPrice()

Testing

1) Test to show our program can be run in NetBeans:

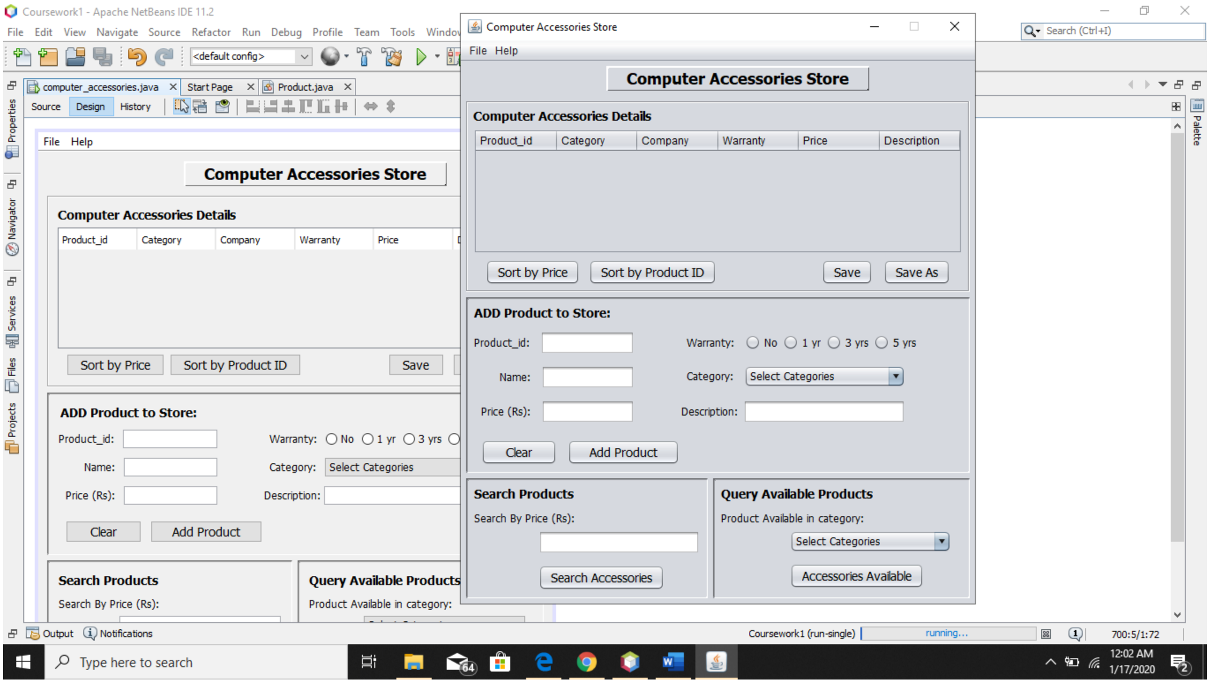
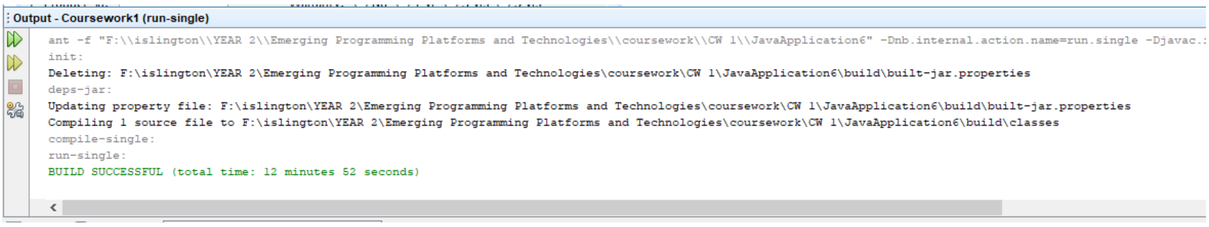

Coursework1 - Apache NetBeans IDE 11.2
File Edit View Navigate Source Refactor Run Debug Profile Team Tools Window
Computer Accessories Store
File Help
Computer Accessories Store
Computer Accessories Details
Product_id Category Company Warranty Price Description
Sort by Price
Sort by Product ID
Save
Save As
ADD Product to Store:
Product_id:
Warranty: No 1 yr 3 yrs 5 yrs
Name:
Category: Select Categories
Price (Rs):
Description:
Clear
Add Product
Search Products
Search By Price (Rs):
Search Accessories
Query Available Products
Product Available in category:
Select Categories
Accessories Available
Output
Notifications
Coursework1 (run-single)
running...
Type here to search
12:02 AM
1/17/2020

Figure 59: running the program in NetBeans

As shown in the above figure, the program developed in this coursework is successfully run in the NetBeans application. It runs and generate a frame design without any errors.



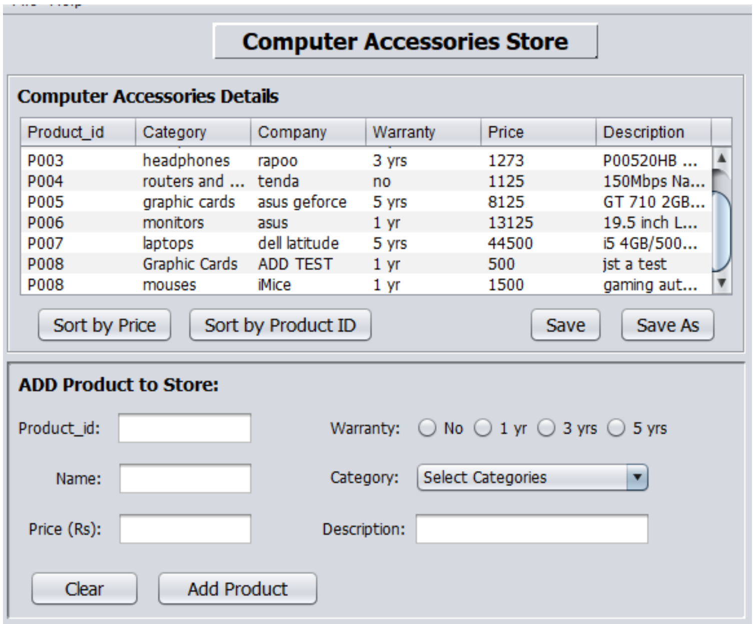
Output - Coursework1 (run-single)

```
ant -f "F:\\islington\\YEAR 2\\Emerging Programming Platforms and Technologies\\coursework\\CW 1\\JavaApplication6" -Dnb.internal.action.name=run.single -Djavac.:
init:
Deleting: F:\islington\YEAR 2\Emerging Programming Platforms and Technologies\coursework\CW 1\JavaApplication6\build\built-jar.properties
deps-jar:
Updating property file: F:\islington\YEAR 2\Emerging Programming Platforms and Technologies\coursework\CW 1\JavaApplication6\build\built-jar.properties
Compiling 1 source file to F:\islington\YEAR 2\Emerging Programming Platforms and Technologies\coursework\CW 1\JavaApplication6\build\classes
compile-single:
run-single:
BUILD SUCCESSFUL (total time: 12 minutes 52 seconds)
```

Figure 60: successful opening and closing of the program with no errors

Test number	1
Action	Run the program in NetBeans
Expected result	The program should run without any errors
Actual result	The program runs without any errors
Test result	Pass

2) Evidence of adding item details in table:



Product_id	Category	Company	Warranty	Price	Description
P003	headphones	rapoo	3 yrs	1273	P00520HB ...
P004	routers and ...	tenda	no	1125	150Mbps Na...
P005	graphic cards	asus geforce	5 yrs	8125	GT 710 2GB...
P006	monitors	asus	1 yr	13125	19.5 inch L...
P007	laptops	dell latitude	5 yrs	44500	i5 4GB/500...
P008	Graphic Cards	ADD TEST	1 yr	500	jst a test
P008	mouses	iMice	1 yr	1500	gaming aut...

Product_id:

Name:

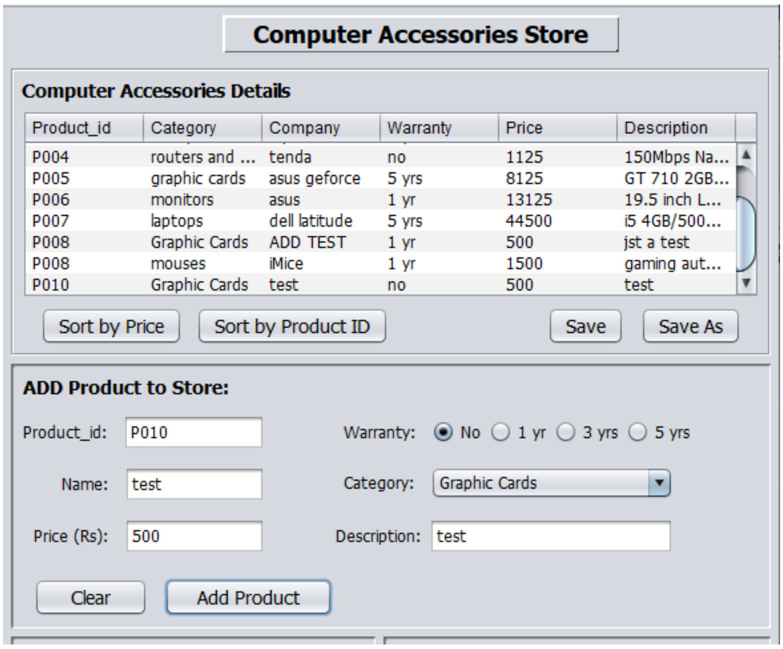
Price (Rs):

Warranty: ○ No ○ 1 yr ○ 3 yrs ○ 5 yrs

Category: Select Categories

Description:

Figure 61: table before clicking "Add Product"



Product_id	Category	Company	Warranty	Price	Description
P004	routers and ...	tenda	no	1125	150Mbps Na...
P005	graphic cards	asus geforce	5 yrs	8125	GT 710 2GB...
P006	monitors	asus	1 yr	13125	19.5 inch L...
P007	laptops	dell latitude	5 yrs	44500	i5 4GB/500...
P008	Graphic Cards	ADD TEST	1 yr	500	jst a test
P008	mouses	iMice	1 yr	1500	gaming aut...
P010	Graphic Cards	test	no	500	test

Product_id: P010

Name: test

Price (Rs): 500

Warranty: ● No ○ 1 yr ○ 3 yrs ○ 5 yrs

Category: Graphic Cards

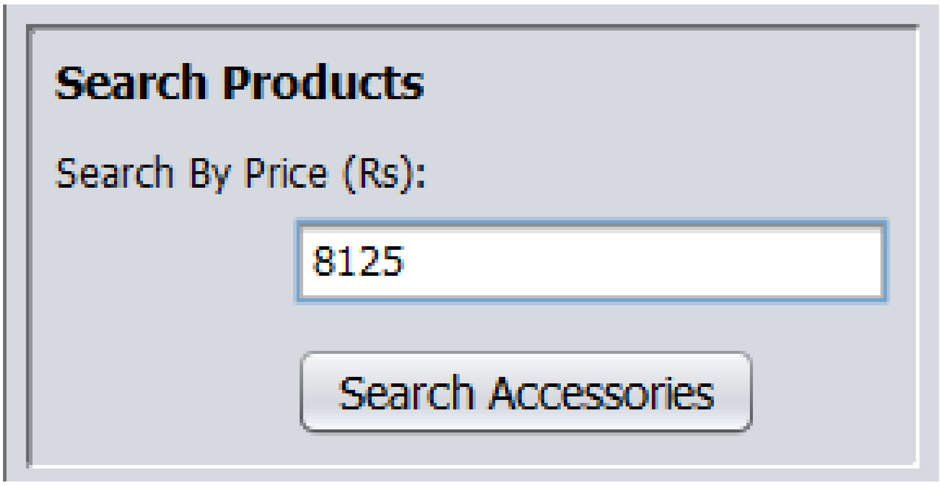
Description: test

Figure 62: table after clicking "Add Product"

Hence the product is successfully added to the table after filling all the required filed and clicking the “Add Product” button as shown in the figure above.

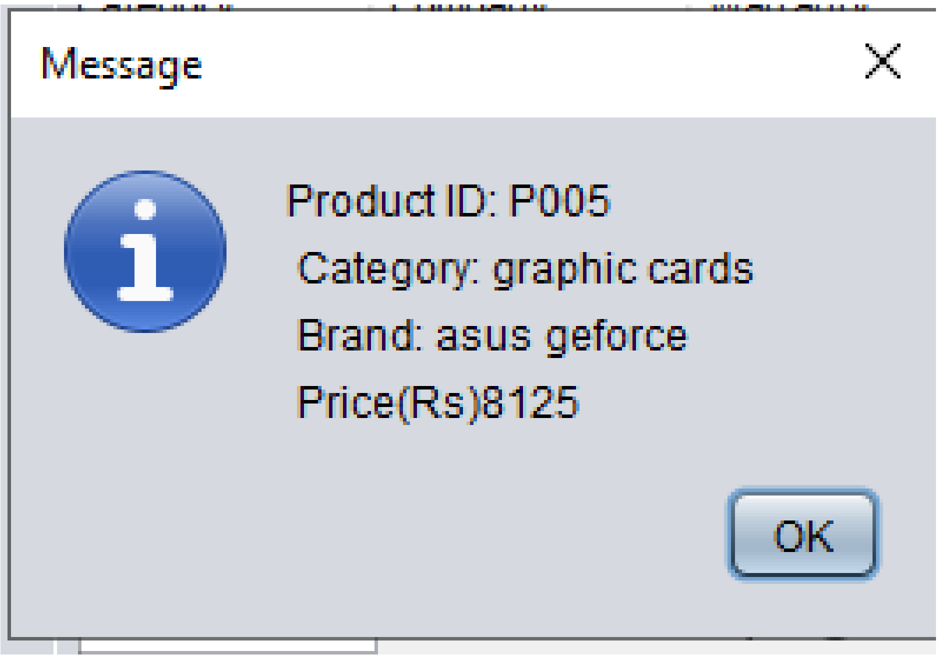
Test number	2
Action	Add a product to the table
Expected result	Added product should be displayed in the table
Actual result	Added product was displayed in the table
Test result	Pass

3) Evidence of searching for item in table based on price:



8125

Figure 63: searching product of price Rs 8125



Product ID: P005
Category: graphic cards
Brand: asus geforce
Price(Rs)8125

Figure 64: search result of product price Rs 8125

Hence it successfully displays the product when search by its price. It uses binary search algorithm.

Test number	3
Action	Enter the price of the product that is available in the table (8125) and click “Search Accessories)
Expected result	Program should display product details of the price entered.
Actual result	Program displayed the product details of the price entered.
Test result	Pass

4) Evidence of searching for number of products in a category:

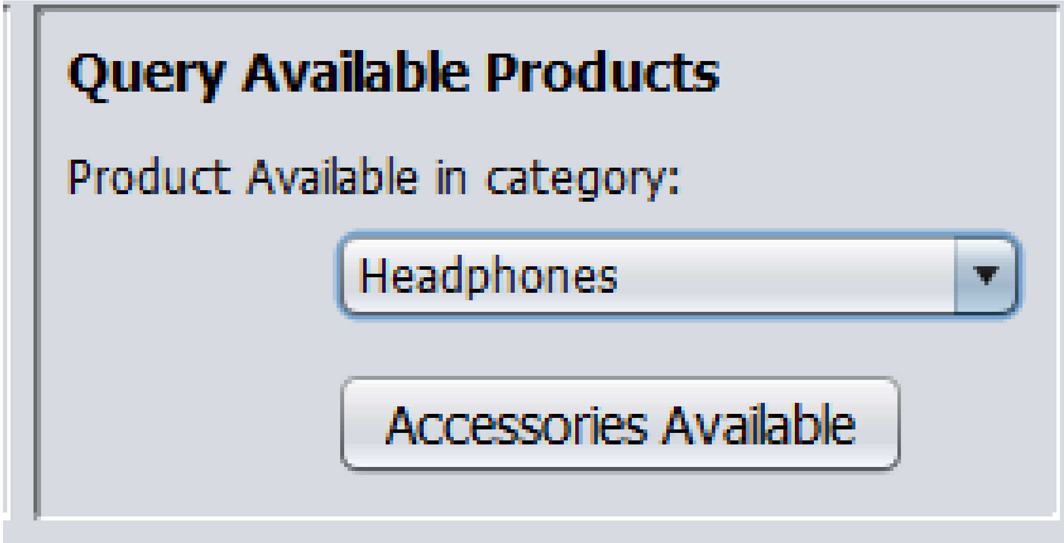
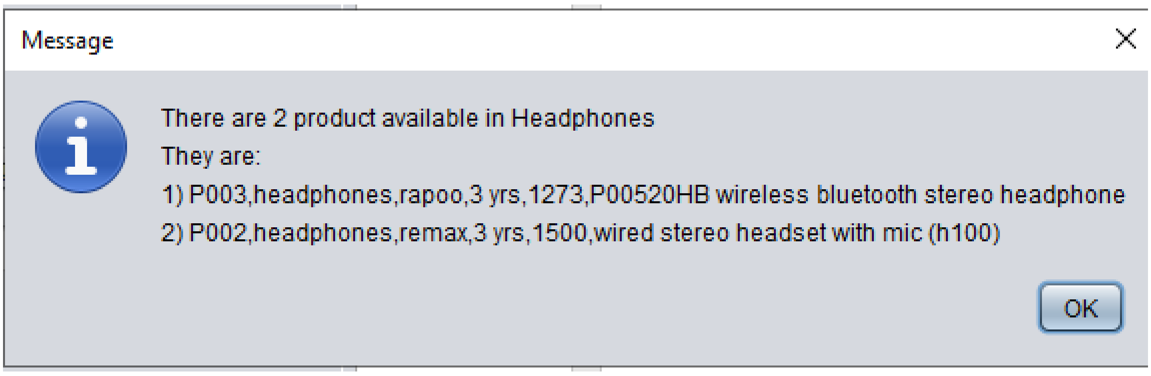


Figure 65: searching available product from categories



Message

There are 2 product available in Headphones
They are:
1) P003,headphones,rapoo,3 yrs,1273,P00520HB wireless bluetooth stereo headphone
2) P002,headphones,remax,3 yrs,1500,wired stereo headset with mic (h100)

Figure 66: Search result of available product from category

It uses linear search algorithm to search the product available in the table on the basis of name of the company that is provided by the user through combo box.

Test number	4
Action	Select the category in the combo box (Headphones) and click “Accessories Available”
Expected result	Program should display all the product details of the categories choose by the user.
Actual result	Program displayed all the product details of the categories choose by the user.
Test result	Pass

5) Evidence of opening a file from menu:

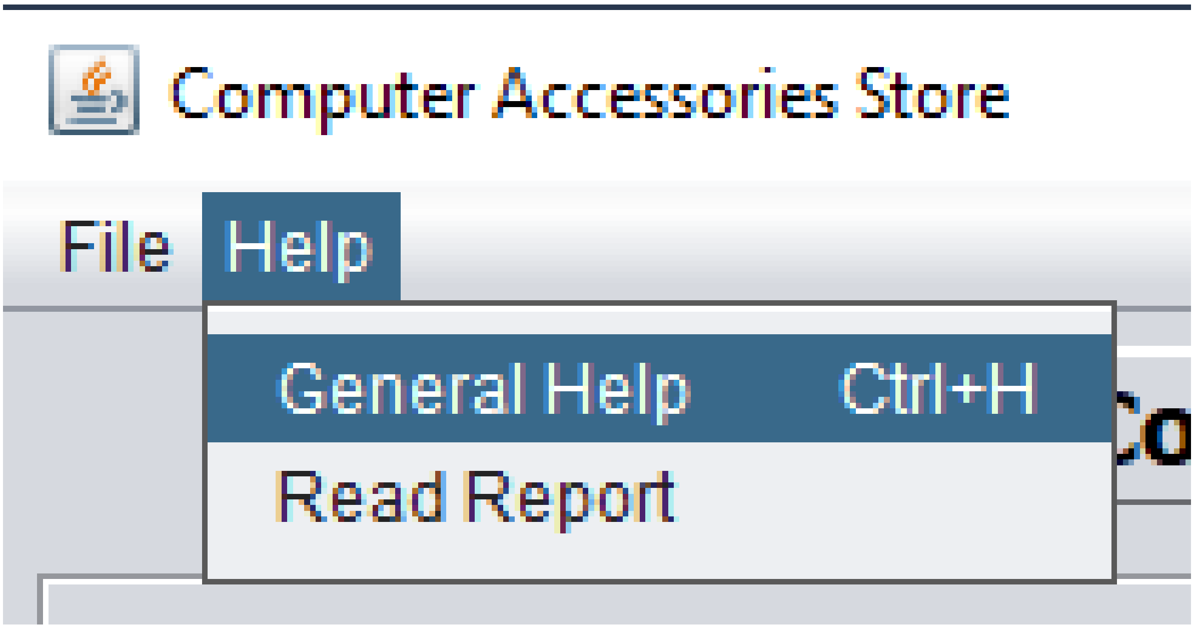
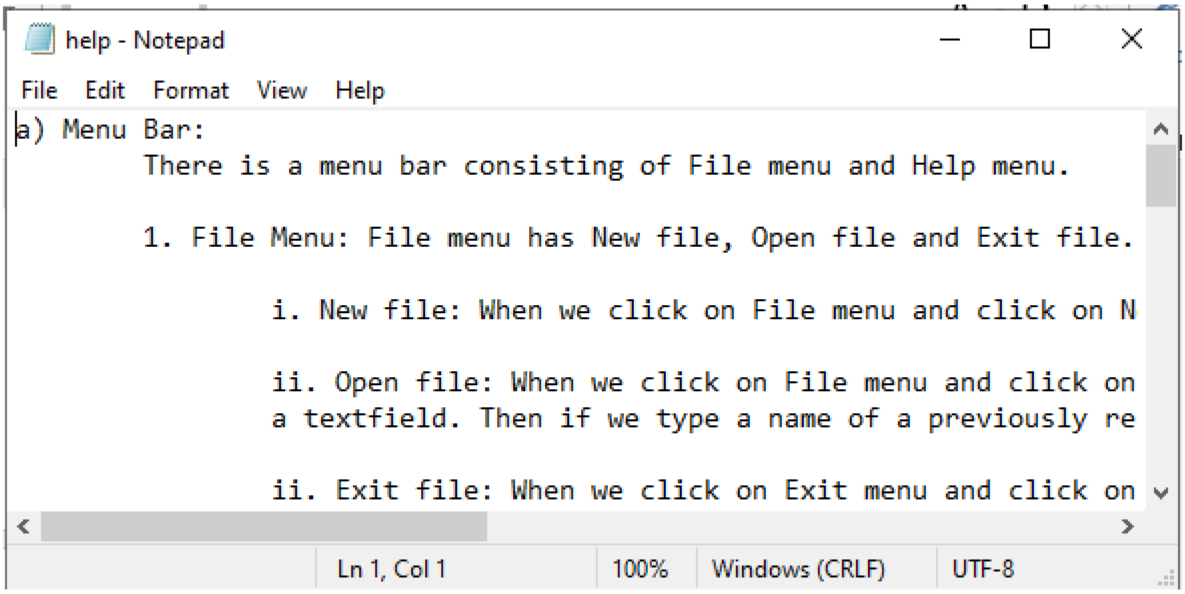


Figure 67: opening help file from menu

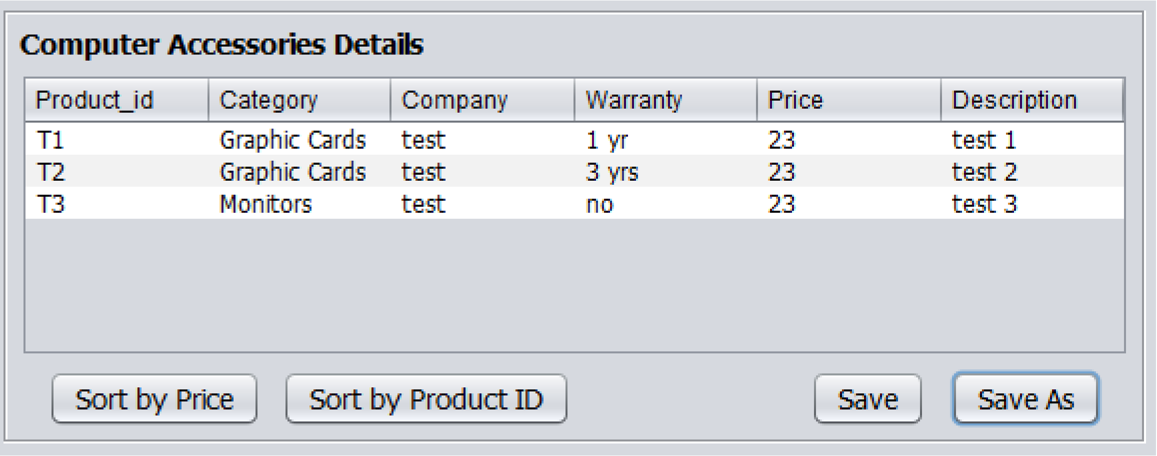


```
a) Menu Bar:
        There is a menu bar consisting of File menu and Help menu.

        1. File Menu: File menu has New file, Open file and Exit file.

                i. New file: When we click on File menu and click on N

                ii. Open file: When we click on File menu and click on
                a textfield. Then if we type a name of a previously re

                ii. Exit file: When we click on Exit menu and click on
```

Figure 68: Help file

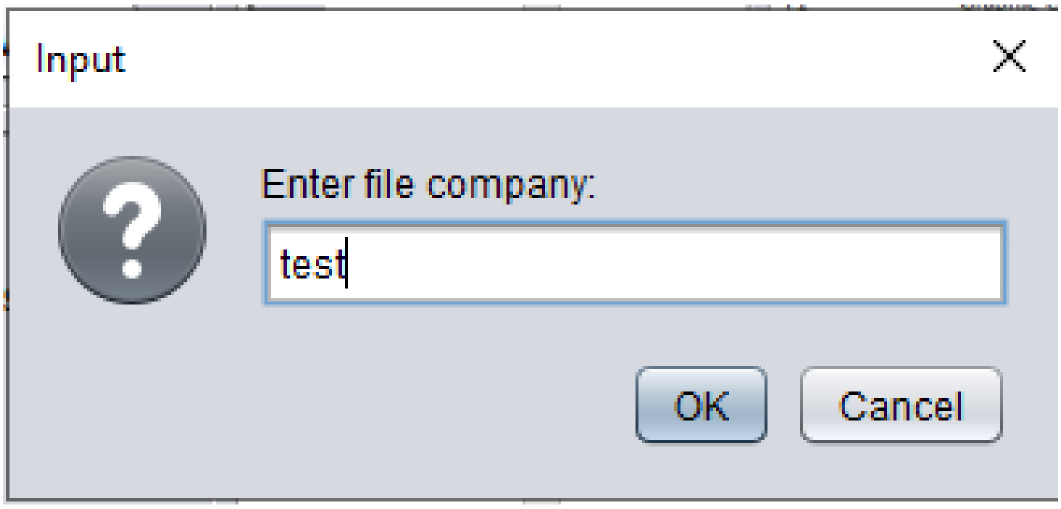
Test number	5
Action	Click help → General Help
Expected result	Help text file should me opened
Actual result	Help text file was opened
Test result	Pass

6) Evidence of saving the file:



Product_id	Category	Company	Warranty	Price	Description
T1	Graphic Cards	test	1 yr	23	test 1
T2	Graphic Cards	test	3 yrs	23	test 2
T3	Monitors	test	no	23	test 3

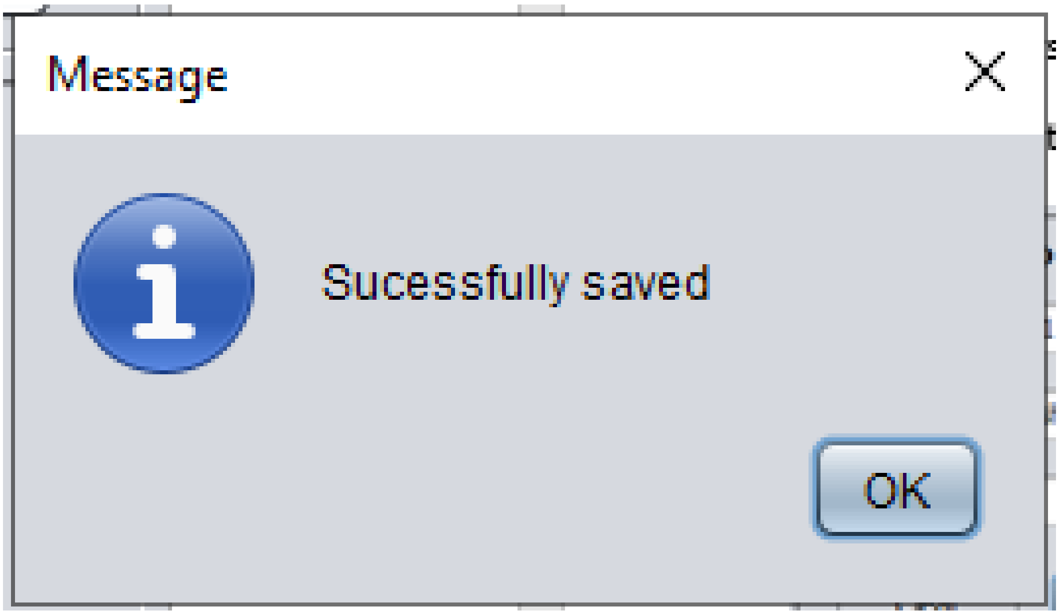
Figure 69: value that is going to be saved



Enter file company:

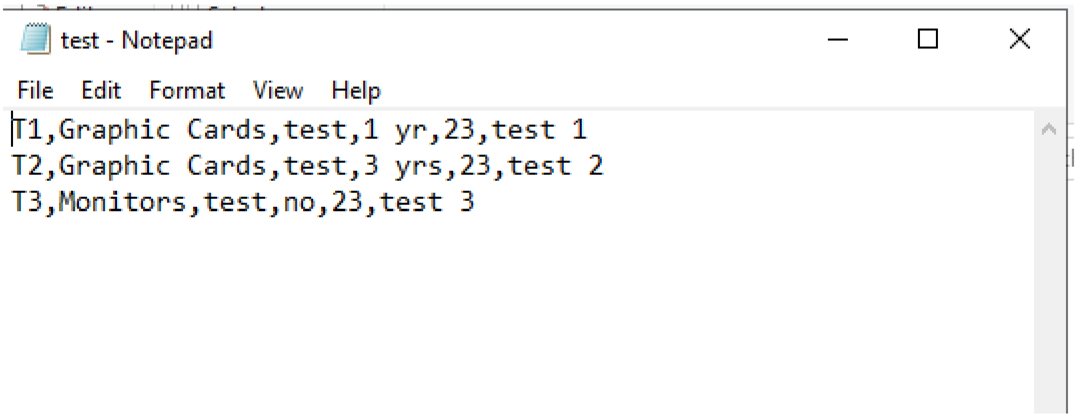
test

Figure 70: saving in file name "test"



Sucessfully saved

Figure 71: success message

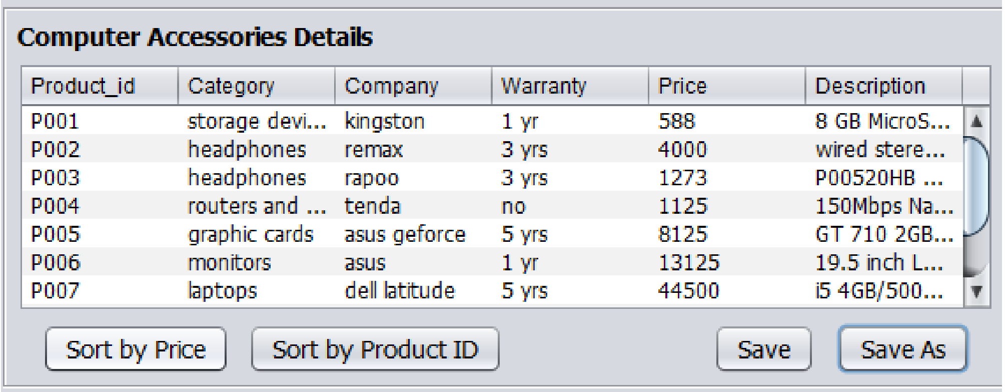


```
T1,Graphic Cards,test,1 yr,23,test 1
T2,Graphic Cards,test,3 yrs,23,test 2
T3,Monitors,test,no,23,test 3
```

Figure 72: txt file "test" created with respective content

Test number	6
Action	Insert the value in the table and save the file in “test”
Expected result	Success message should be shown and new txt file named “test” should be created that has required content.
Actual result	Success message was shown and new txt file named “test” was created that has required content.
Test result	Pass

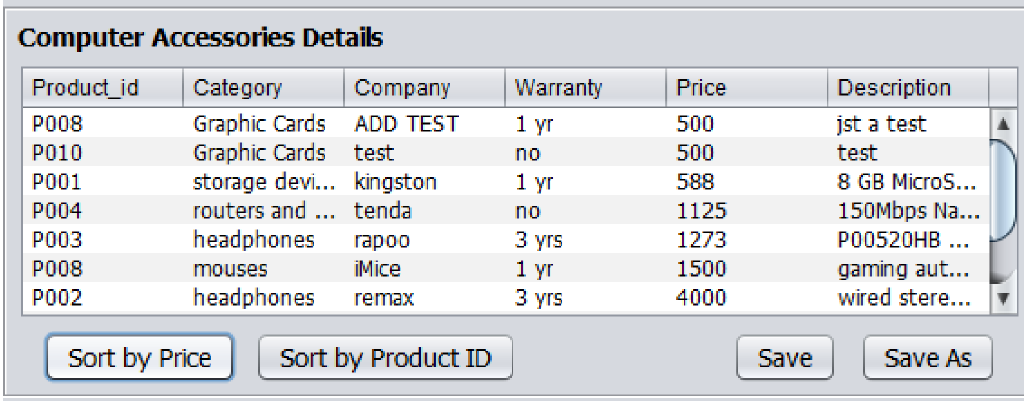
7) Evidence of working of “Sort by Price” button:



Computer Accessories Details

Product_id	Category	Company	Warranty	Price	Description
P001	storage devi...	kingston	1 yr	588	8 GB MicroS...
P002	headphones	remax	3 yrs	4000	wired stere...
P003	headphones	rapoo	3 yrs	1273	P00520HB ...
P004	routers and ...	tenda	no	1125	150Mbps Na...
P005	graphic cards	asus geforce	5 yrs	8125	GT 710 2GB...
P006	monitors	asus	1 yr	13125	19.5 inch L...
P007	laptops	dell latitude	5 yrs	44500	i5 4GB/500...

Figure 73: data before sorting by price



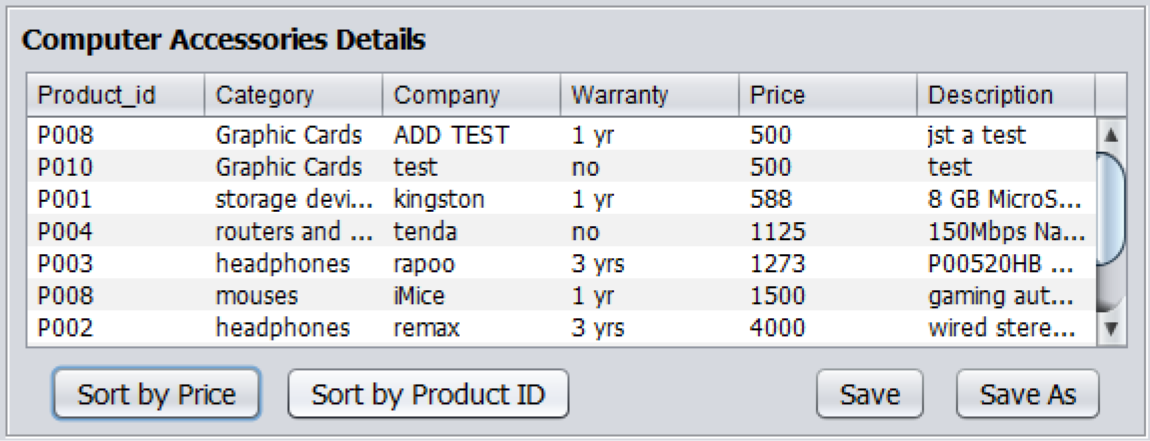
Computer Accessories Details

Product_id	Category	Company	Warranty	Price	Description
P008	Graphic Cards	ADD TEST	1 yr	500	jst a test
P010	Graphic Cards	test	no	500	test
P001	storage devi...	kingston	1 yr	588	8 GB MicroS...
P004	routers and ...	tenda	no	1125	150Mbps Na...
P003	headphones	rapoo	3 yrs	1273	P00520HB ...
P008	mouses	iMice	1 yr	1500	gaming aut...
P002	headphones	remax	3 yrs	4000	wired stere...

Figure 74: data after sorting by price

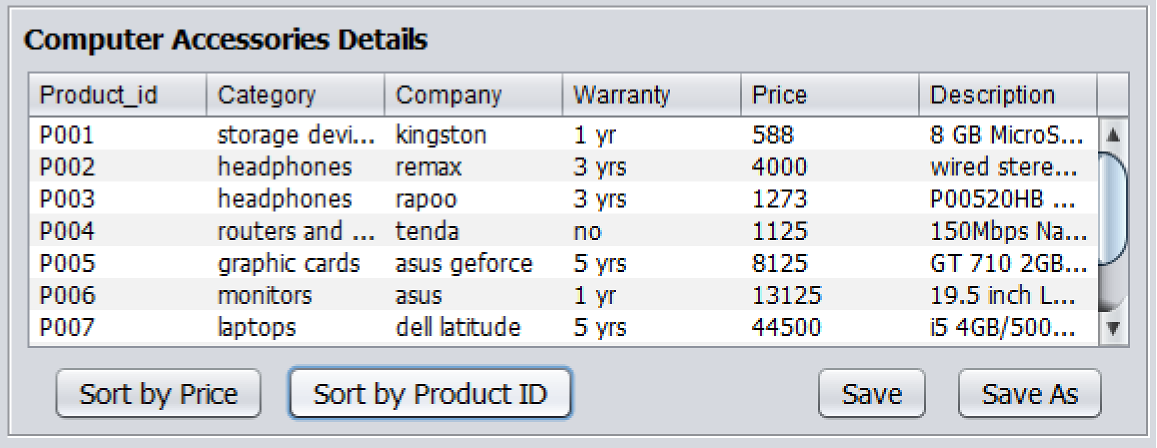
Test number	7
Action	Click the “Sort by price” button
Expected result	The value of table should be sorted in ascending order according to price.
Actual result	The value of table was sorted in ascending order according to price.
Test result	Pass

8) Evidence of working of “Sort by Product ID” button:


Computer Accessories Details

Product_id	Category	Company	Warranty	Price	Description
P008	Graphic Cards	ADD TEST	1 yr	500	jst a test
P010	Graphic Cards	test	no	500	test
P001	storage devi...	kingston	1 yr	588	8 GB MicroS...
P004	routers and ...	tenda	no	1125	150Mbps Na...
P003	headphones	rapoo	3 yrs	1273	P00520HB ...
P008	mouses	iMice	1 yr	1500	gaming aut...
P002	headphones	remax	3 yrs	4000	wired stere...

Figure 75: table before sorting according to product ID

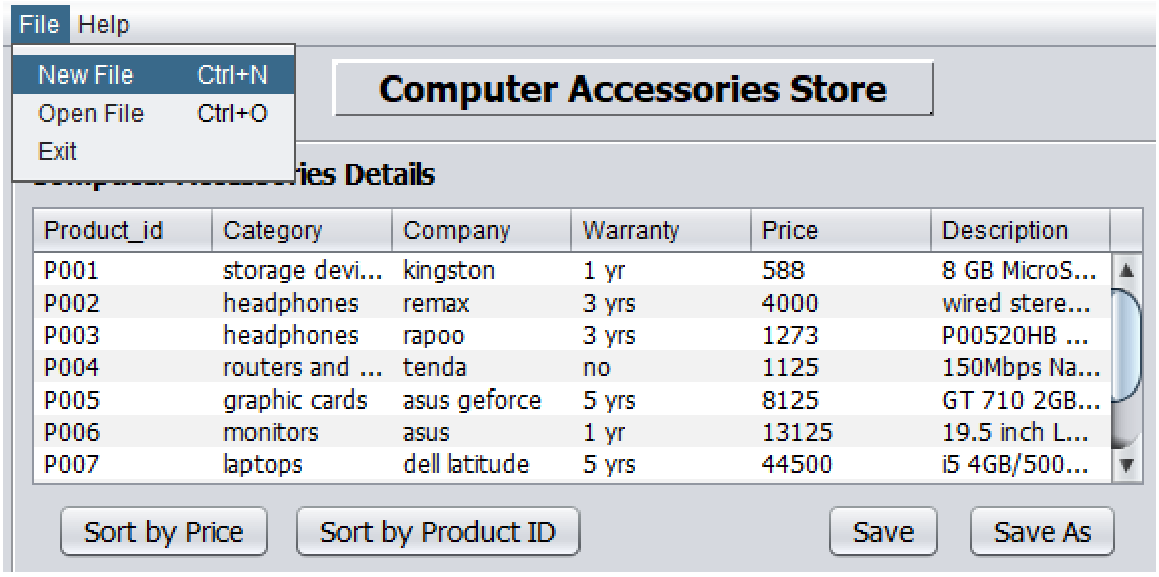

Computer Accessories Details

Product_id	Category	Company	Warranty	Price	Description
P001	storage devi...	kingston	1 yr	588	8 GB MicroS...
P002	headphones	remax	3 yrs	4000	wired stere...
P003	headphones	rapoo	3 yrs	1273	P00520HB ...
P004	routers and ...	tenda	no	1125	150Mbps Na...
P005	graphic cards	asus geforce	5 yrs	8125	GT 710 2GB...
P006	monitors	asus	1 yr	13125	19.5 inch L...
P007	laptops	dell latitude	5 yrs	44500	i5 4GB/500...

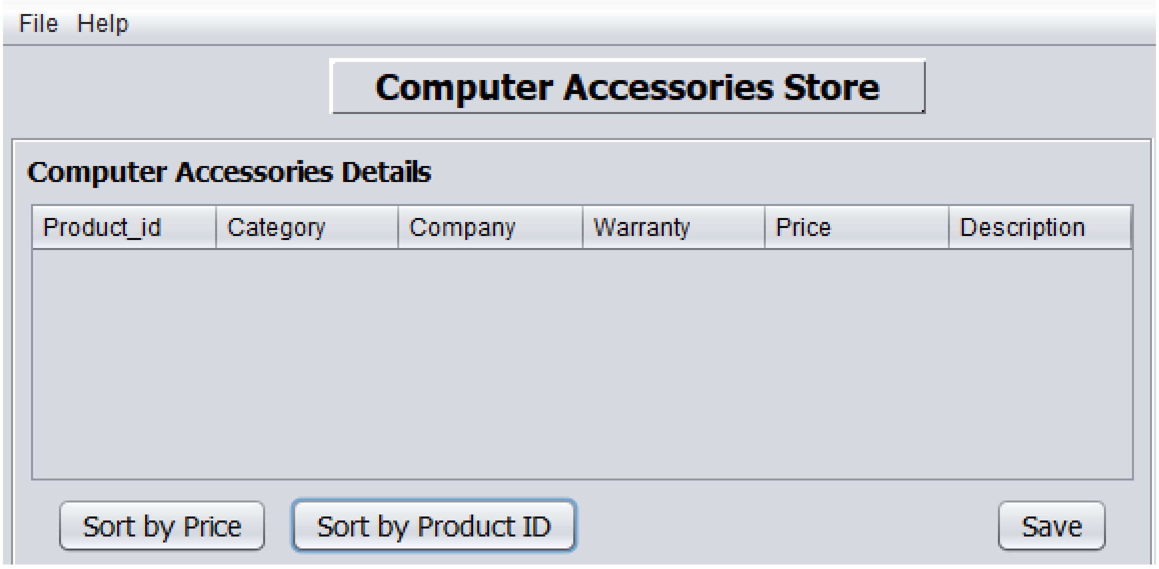
Figure 76: After sorting according to Product ID

Test number	8
Action	Click the “Sort by product ID” button
Expected result	The value of table should be sorted in ascending order according to product ID
Actual result	The value of table was sorted in ascending order according to product ID
Test result	Pass

9) Evidence of working of new menu:



Product_id	Category	Company	Warranty	Price	Description
P001	storage devi...	kingston	1 yr	588	8 GB MicroS...
P002	headphones	remax	3 yrs	4000	wired stere...
P003	headphones	rapoo	3 yrs	1273	P00520HB ...
P004	routers and ...	tenda	no	1125	150Mbps Na...
P005	graphic cards	asus geforce	5 yrs	8125	GT 710 2GB...
P006	monitors	asus	1 yr	13125	19.5 inch L...
P007	laptops	dell latitude	5 yrs	44500	i5 4GB/500...



Product_id	Category	Company	Warranty	Price	Description

Test number	9
Action	Click the New button in the file menu
Expected result	All the values of the table should be disappeared
Actual result	All the values of the table were disappeared
Test result	Pass

10) Evidence of working of Exit button:

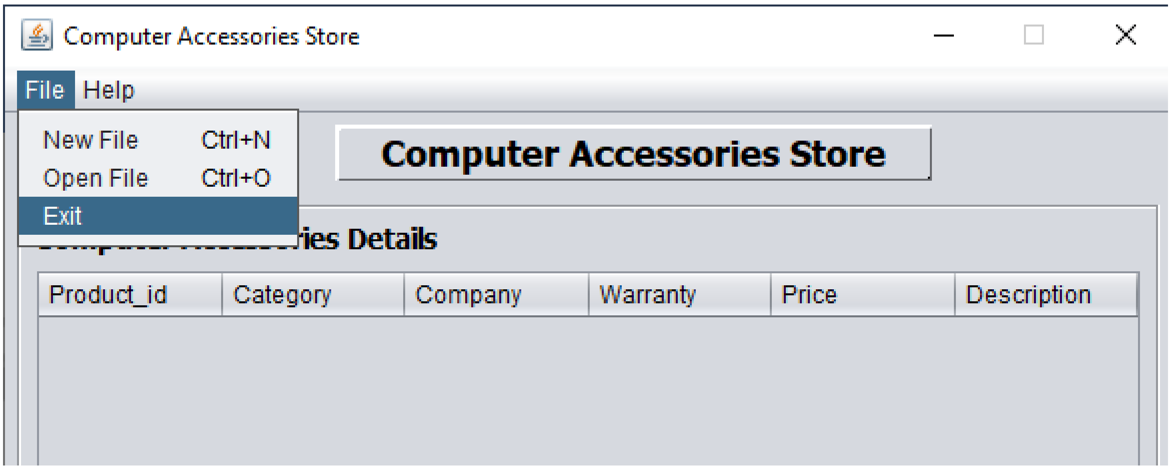
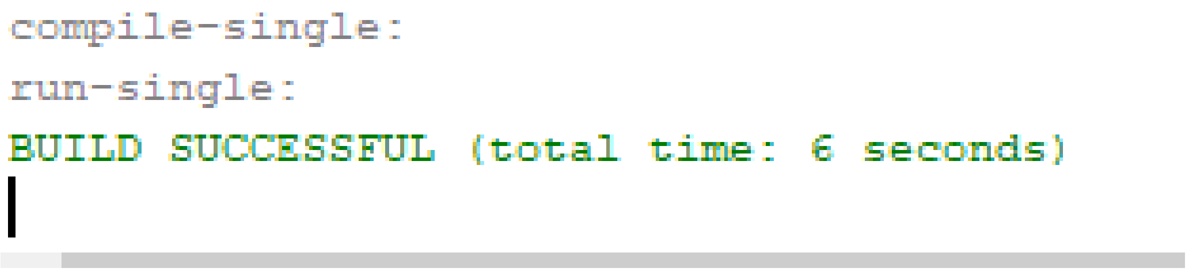


Figure 77: Before clicking exit button



```
compile-single:
run-single:
BUILD SUCCESSFUL (total time: 6 seconds)
```

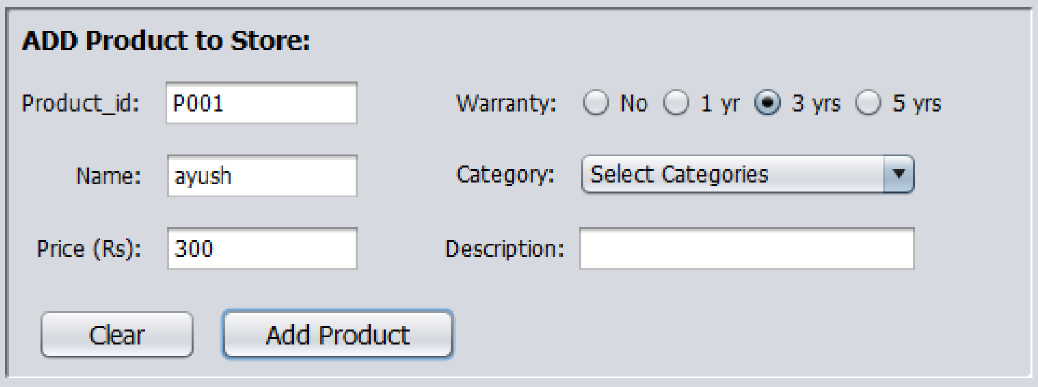
Figure 78: after clicking exit button

Test number	10
Action	Click the Exit button in the file menu
Expected result	Program should be successfully closed
Actual result	Program was successfully closed
Test result	Pass

Validation:

Evidence on system validation:

1) It doesn’t let to add the product to the table until all the fields are filled.



ADD Product to Store:

Product_id: P001

Name: ayush

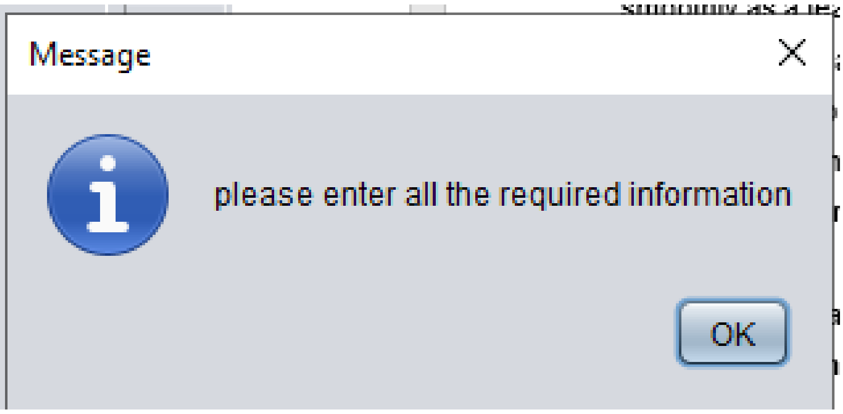
Price (Rs): 300

Warranty: ○ No ○ 1 yr ● 3 yrs ○ 5 yrs

Category: Select Categories

Description:

Figure 79: Trying to add product with some empty fields

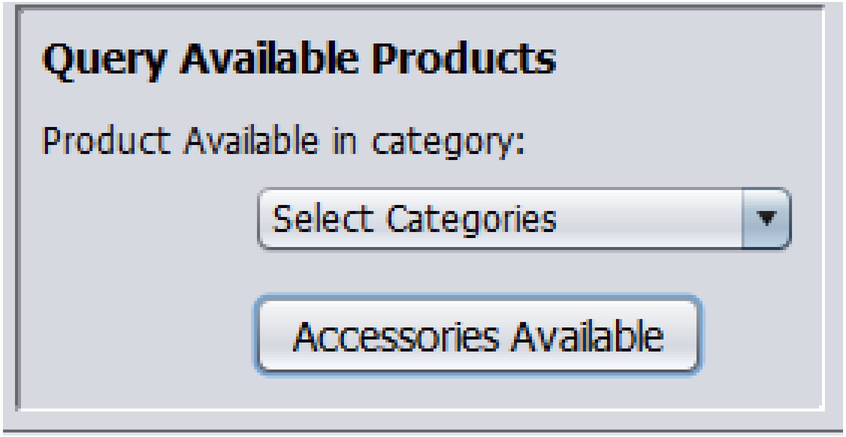


Message

please enter all the required information

Figure 80: dialog box appeared saying "enter all the info"

2) It doesn’t let to inquiry the available accessories until any category is selected in the combo box.

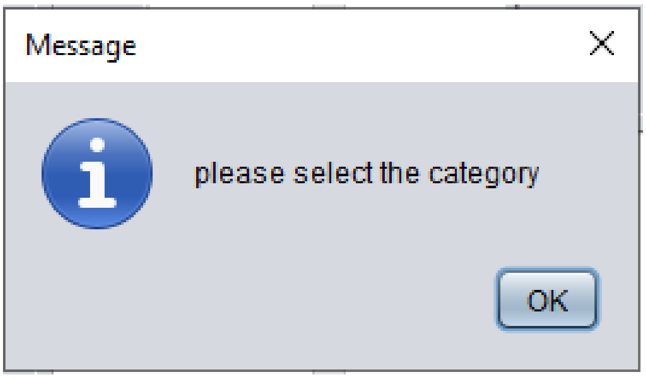


Query Available Products

Product Available in category:

Select Categories

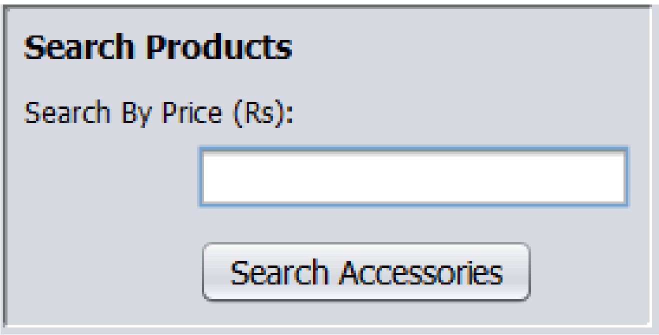
Figure 81: trying to search without selecting category


Message

please select the category

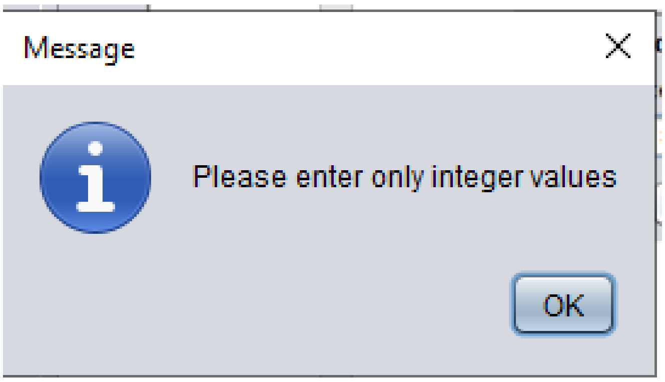
Figure 82: dialog box appered saying "select category"

3) It doesn't accept integer values in the text field of the price:


Search Products

Search By Price (Rs):

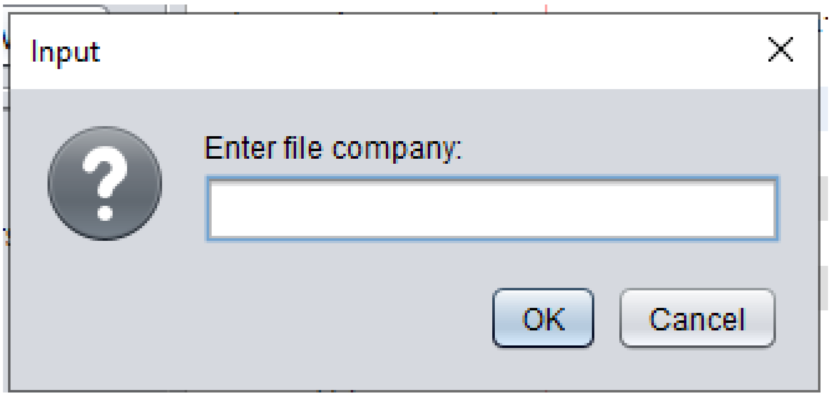
Figure 83: trying to enter string in price


Message

Please enter only integer values

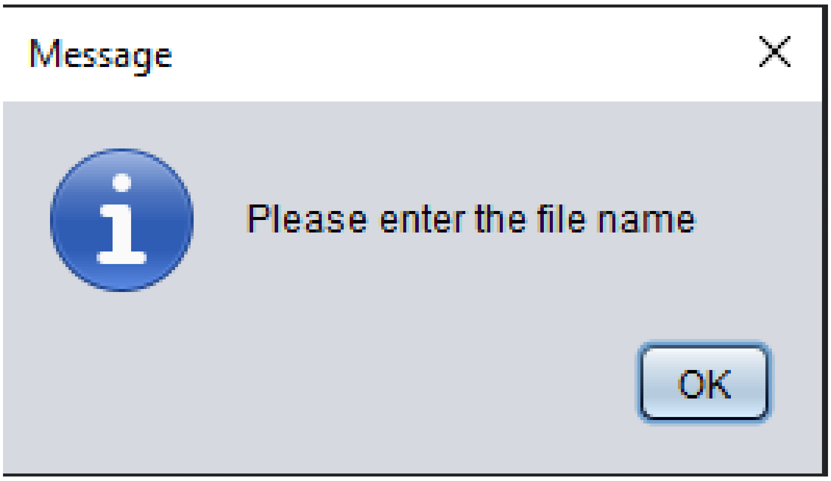
Figure 84: dialog box appeared saying "enter only integer"

4) It does not accept empty values in the file name when the user tries to Save or Save As the file.



Enter file company:

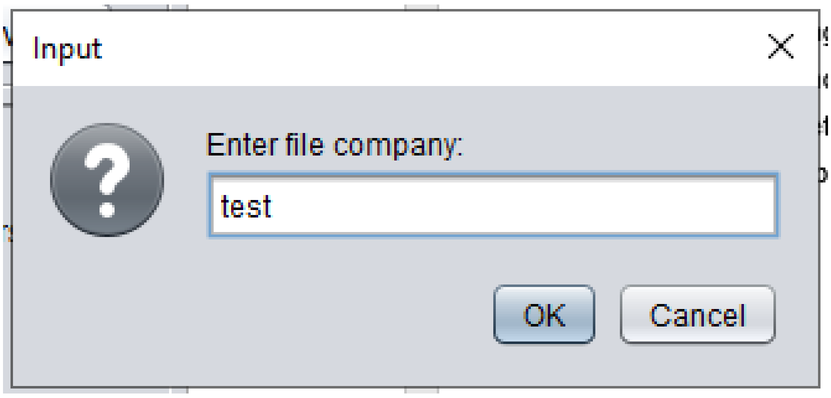
Figure 85: Trying to insert empty file name



Please enter the file name

Figure 86: message after empty file name is inserted

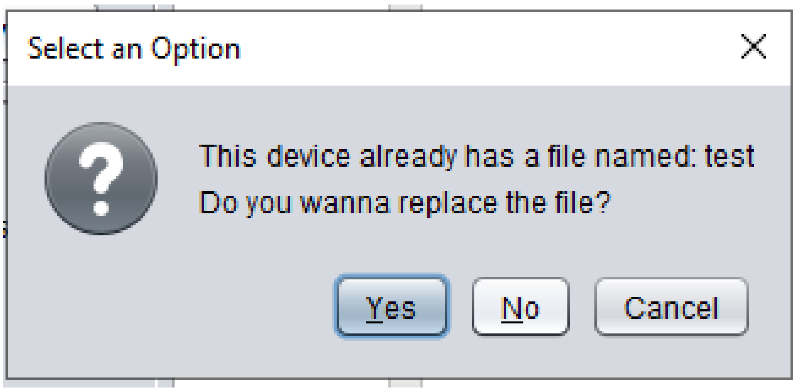
5) If the user tries to save the file with the name that already exists in the system, then the program asks the user whether they want to replace the file or not.



Enter file company:

test

Figure 87: entering the file name that already exits

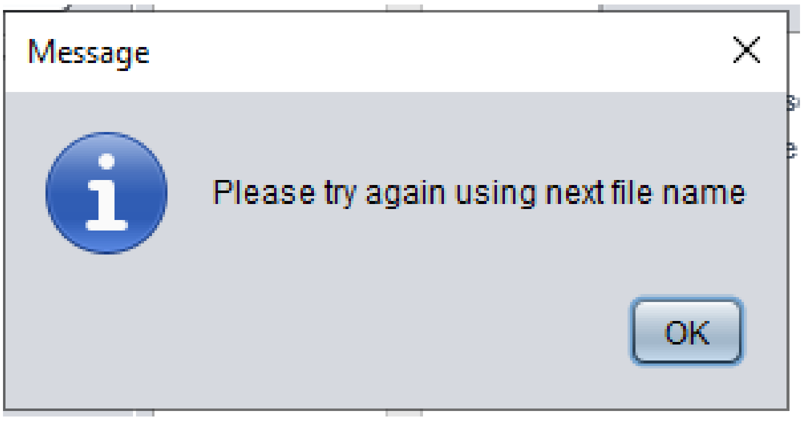


Select an Option

This device already has a file named: test
Do you wanna replace the file?

Figure 88: Message after already exited filename is entered

6) If the user input “NO” at the replace confirmation dialog box then the system asks the user to enter the new name:

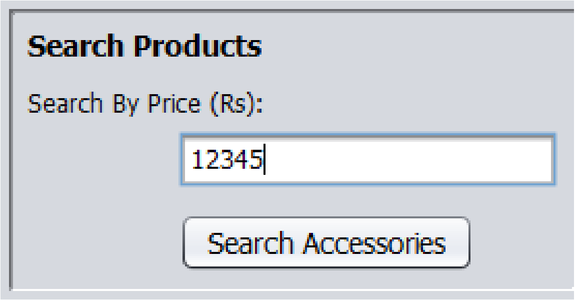


Message

Please try again using next file name

Figure 89: Message after clicking no

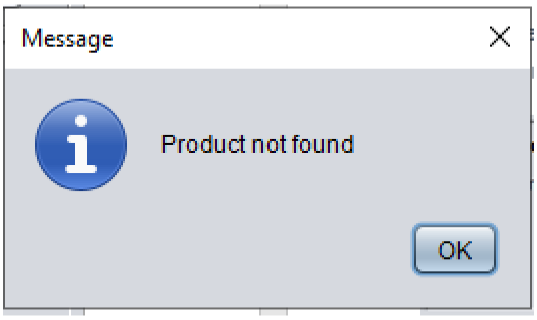
7) If the user enters the value of price that are not available in the store than the program displays appropriate message.



Search Products

Search By Price (Rs): 12345

Figure 91: Trying to insert value that is not available

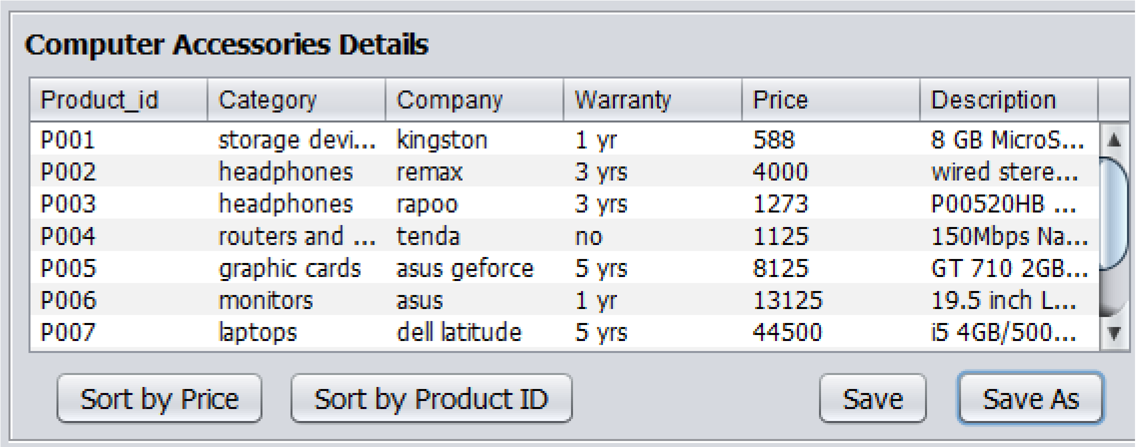


Message

Product not found

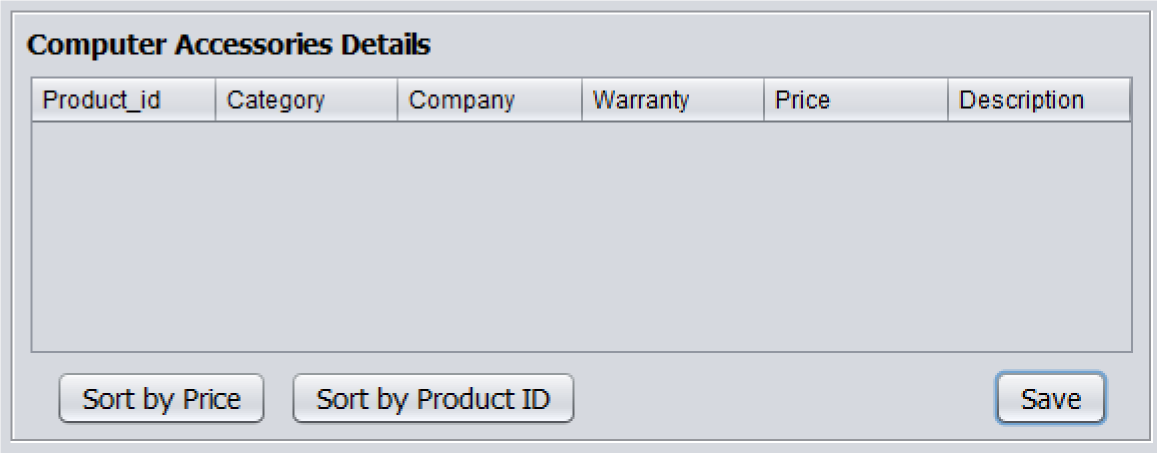
Figure 90: message after inserting not available value

8) If the user opens the new file, then the save as button is invisible.


Computer Accessories Details

Product_id	Category	Company	Warranty	Price	Description
P001	storage devi...	kingston	1 yr	588	8 GB MicroS...
P002	headphones	remax	3 yrs	4000	wired stere...
P003	headphones	rapoo	3 yrs	1273	P00520HB ...
P004	routers and ...	tenda	no	1125	150Mbps Na...
P005	graphic cards	asus geforce	5 yrs	8125	GT 710 2GB...
P006	monitors	asus	1 yr	13125	19.5 inch L...
P007	laptops	dell latitude	5 yrs	44500	i5 4GB/500...

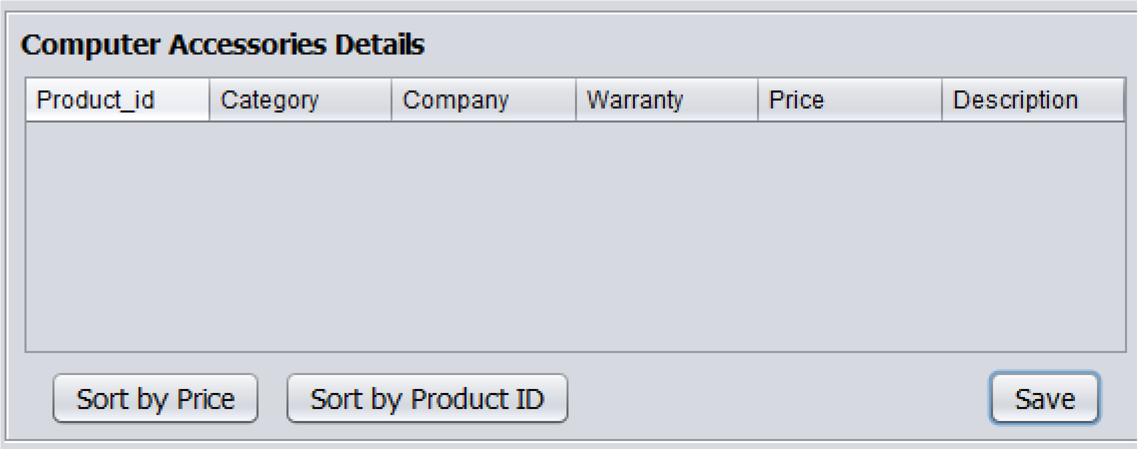
Figure 92: Before opening new file


Computer Accessories Details

Product_id	Category	Company	Warranty	Price	Description

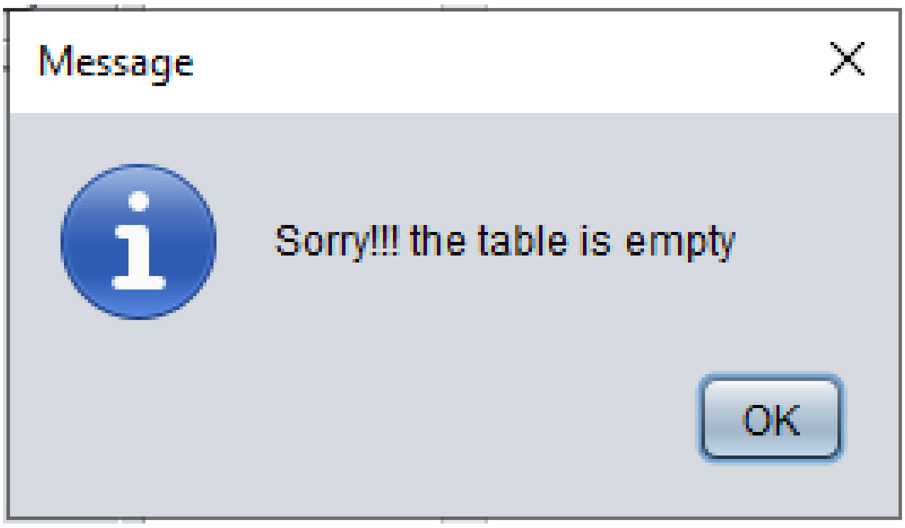
Figure 93: After opening new file

9) The program does not allow user to save the file when the user tries to save the file when the table is empty


Computer Accessories Details

Product_id	Category	Company	Warranty	Price	Description

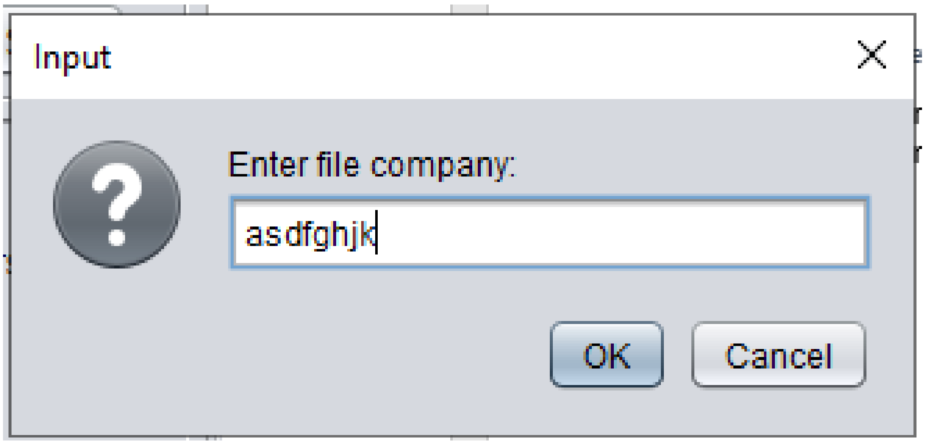
Figure 94: trying to save empty table



Sorry!!! the table is empty

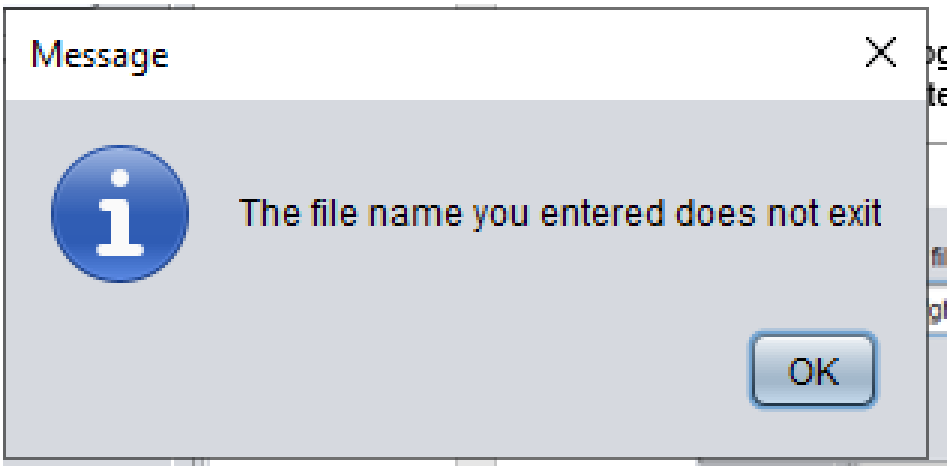
Figure 95: Message after saving empty table

10) The program does not allow the user to open the file that is not available in the system already



Enter file company: asdfghjk

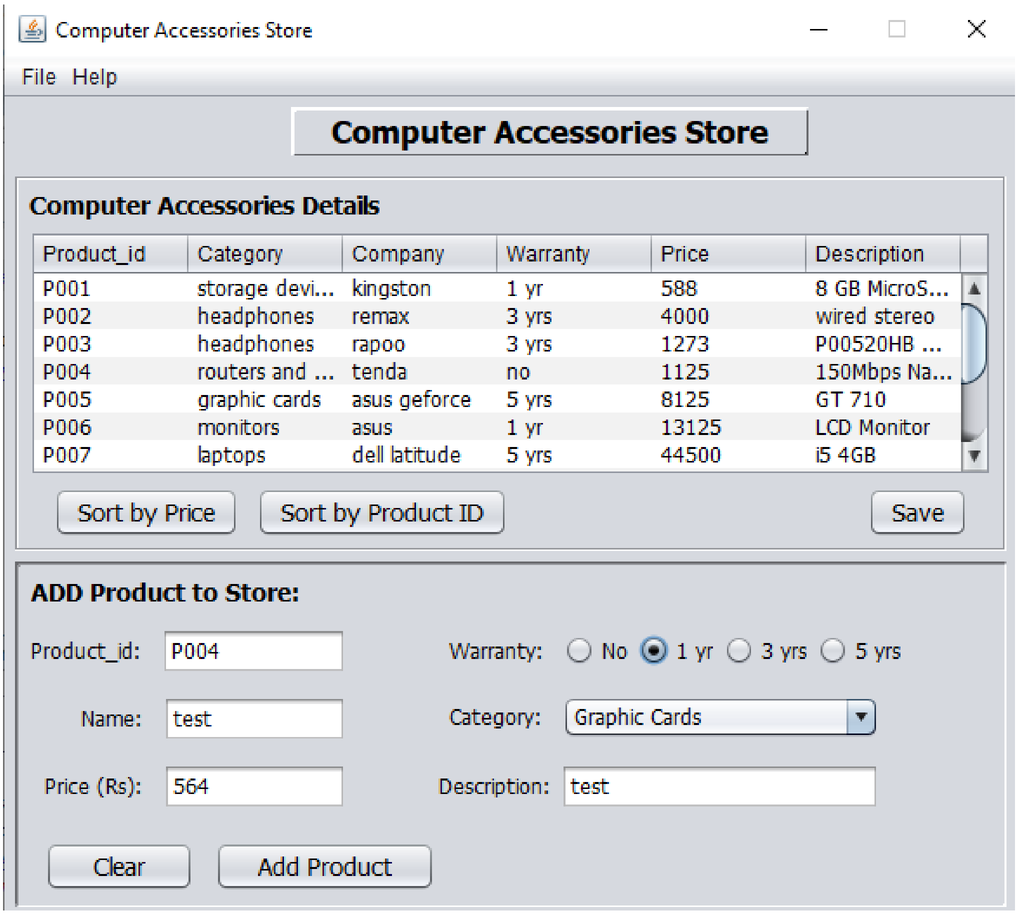
Figure 96: trying to open the file that does not exits



The file name you entered does not exit

Figure 97: message after inserting file name that does not exits

11) The system does not allow the user to add the product in the table if the table consist of the product of the same product ID as entered by the user:



Product_id	Category	Company	Warranty	Price	Description
P001	storage devi...	kingston	1 yr	588	8 GB MicroS...
P002	headphones	remax	3 yrs	4000	wired stereo
P003	headphones	rapoo	3 yrs	1273	P00520HB ...
P004	routers and ...	tenda	no	1125	150Mbps Na...
P005	graphic cards	asus geforce	5 yrs	8125	GT 710
P006	monitors	asus	1 yr	13125	LCD Monitor
P007	laptops	dell latitude	5 yrs	44500	i5 4GB

Product_id: P004

Name: test

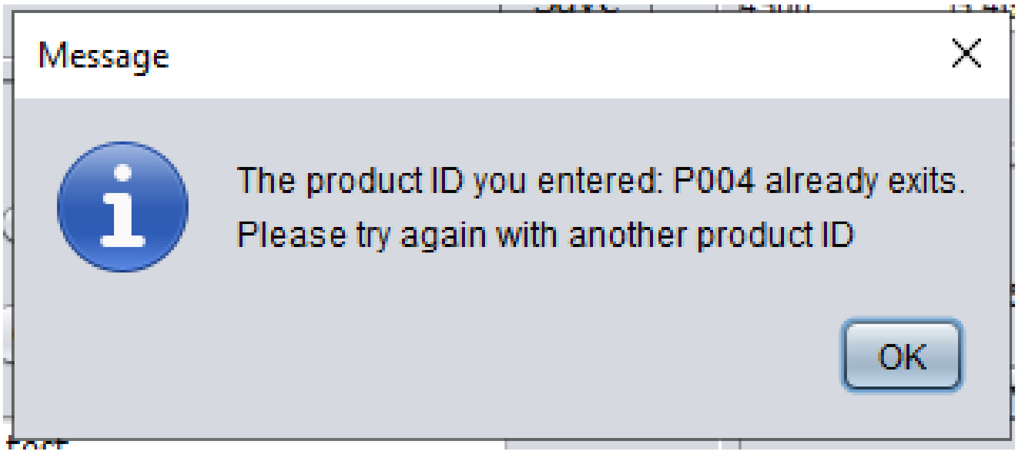
Price (Rs): 564

Warranty: ○ No ● 1 yr ○ 3 yrs ○ 5 yrs

Category: Graphic Cards

Description: test

Figure 98: trying to add the product of same product ID



The product ID you entered: P004 already exits.
Please try again with another product ID

Figure 99: message after adding product of same product ID

Conclusion

From this group coursework, we learnt how to handle a project successful smoothly as a team by diving project to its part and taking part on those responsibilities by each individual. From this coursework, we learnt how to propose and develop the system. We also get the knowledge of sorting and to use the binary search algorithm for searching function. We also test the system to check that whether our program is displaying required results or not such as pop up of dialog box with appropriate message when inappropriate or no value was inserted during execution, test the system to open a file from menu and all other test for running system without error and bugs through which we realize the importance of testing. The system was developed on NetBeans based on a java swing-based application which makes the coding much easier by dragging and dropping the required palette onto a canvas. Through this project we learn how to design and develop GUI based system on java programming language with NetBeans Integrated Development Environment (IDE) and would be helpful for developing any Information System in our carrier.

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