

**GTU Department of
Computer Engineering
CSE 222/505 - Spring
2021**

Homework 6 Report

**BAHADIR ETKA KILINÇ
1901042701**

Problem Solution Approach

In this project, I was asked to organize them according to the desired searches and filters stored in a source file. I tried to use ArrayList, LinkedList, Queue, Tree, Hash Table classes in the necessary java collection efficiently. In addition to these, I implemented 3 different sorting algorithms (Merge, Quick, Heap) and used them when sorting products.

Class Diagram

ProductUtil		
ProductUtil()		
acceptOrder(String, String)		void
addOrder(ArrayList<Product>, String, String)		void
addProduct(Product, String)		void
cancelOrder(String)		void
createFile(List<Product>, File)		void
deleteProduct(String)		void
displayOrders(String)		void
editProduct(String)		void
filterCategory(ArrayList<Product>, String)		void
priceFilter(ArrayList<Product>, int, int)		void
priceFilter(ArrayList<Product>, int, int, int)		void
readProductsFile()		void
searchFile(String)		void
searchOnFile(ArrayList<Product>, String, int)		void
searchSort(ArrayList<Product>, int)		void
sorter(ArrayList<Product>, int)		void

Product		
Product()		
Product(String, String, String, String, String, String, String)		
compareTo(Product)		int
toString()		String
category		String
description		String
discountedPrice		String
id		String
name		String
price		String
productCategory		String
trader		String

UserUtil		
users Hashtable<String, String>		
UserUtil()		
getUserID(String)		String?
getUserName(String)		String?
readUsersFile()		void
userLogin(String, String)		int

QuickSort		
QuickSort()		
compare(Product, Product)		int
partition(ArrayList<T>, int, int)		int
quickSort(ArrayList<T>, int, int)		void
sort(ArrayList<T>)		void
swap(ArrayList<T>, int, int)		void

HeapSort		
HeapSort()		
buildHeap(ArrayList<T>)		void
compare(Product, Product)		int
shrinkHeap(ArrayList<T>)		void
sort(ArrayList<T>)		void
swap(ArrayList<T>, int, int)		void

Main		
Main()		
CustomerMenu(String)		void
TraderMenu(String)		void
UserMenu(String, String)		void
displayMenu()		void
main(String[])		void

MergeSort		
MergeSort()		
compare(Product, Product)		int
merge(ArrayList<T>, ArrayList<T>, ArrayList<T>)		void
sort(ArrayList<T>)		void

NameComparator		
NameComparator()		
compare(Object, Object)		int

Test Cases and Running Results

Costumer login the system.

```
Welcome to E-Shopping application
User Id:(Exit-> -1) 00000000
Password: 000000
Welcome Bahadir

1) Search and query the product
2) Display all the products of a trader
0) Exit
```

Costumer searches trader's product

```
1) Search and query the product
2) Display all the products of a trader
0) Exit
2
Please enter a trader name: Alisha
SRTEH2F6HUZMQ6SJ;Alisha Solid Women's Cycling Shorts;["Clothing >> Women's Clothing >> Lingerie, Sleep & Swimwear >> Shorts >> Alisha Shorts >> Alisha Solid Women's Cycling Shorts"]
SRTEH2FECMGNZJXJ;Alisha Solid Women's Cycling Shorts;["Clothing >> Women's Clothing >> Lingerie, Sleep & Swimwear >> Shorts >> Alisha Shorts >> Alisha Solid Women's Cycling Shorts"]
SRTEH2FFRKEDEF6F;Alisha Solid Women's Cycling Shorts;["Clothing >> Women's Clothing >> Lingerie, Sleep & Swimwear >> Shorts >> Alisha Shorts >> Alisha Solid Women's Cycling Shorts"]
SRTEH2F6B0J6X8FW;Alisha Solid Women's Cycling Shorts;["Clothing >> Women's Clothing >> Lingerie, Sleep & Swimwear >> Shorts >> Alisha Shorts >> Alisha Solid Women's Cycling Shorts"]
SRTEH2FVUHAHV9X;Alisha Solid Women's Cycling Shorts;["Clothing >> Women's Clothing >> Lingerie, Sleep & Swimwear >> Shorts >> Alisha Shorts >> Alisha Solid Women's Cycling Shorts"]
SRTEH2FVVRBAXHB;Alisha Solid Women's Cycling Shorts;["Clothing >> Women's Clothing >> Lingerie, Sleep & Swimwear >> Shorts >> Alisha Shorts >> Alisha Solid Women's Cycling Shorts"]
```

Searching a product with a name

```
Welcome Bahadir

1) Search and query the product
2) Display all the products of a trader
0) Exit
1
Please enter a product name: Boots
SHOEFHKHHV6ZQ9FY;20Dresses Brown Shiver Me Timbers Boots;["Footwear >> Women's Footwear >> Casual Shoes >> Boots"]
SHOE89XZZKW8GAC6;99 Moves Boots;["Footwear >> Men's Footwear >> Casual Shoes >> 99 Moves Boots"]
SHOE36GSRHDH5YQ;99Moves MOV-269-9 Boots;["Footwear >> Men's Footwear >> Casual Shoes >> 99Moves MOV-269-9 Boots"]
SHOE53GTNBHWXQ3M;AS Sports Airfort Boots;["Footwear >> Men's Footwear >> Casual Shoes >> AS Sports Airfort Boots"]
SHOECXPHZSFGQEZ;Anand Archies Boots;["Footwear >> Women's Footwear >> Casual Shoes >> Anand Archies Boots"]
SHODYQE7VUJC5ZUF;Arden Bushey Derby Boots;["Footwear >> Men's Footwear >> Casual Shoes >> Arden Bushey Derby Boots"]
SHOEC6RMWCKHY;Arden Crouch Scouting Boots;["Footwear >> Men's Footwear >> Casual Shoes >> Arden Crouch Scouting Boots"]
```

Sorting results by price

```
According to what would you like to sort?
1) Name
2) Price
3) Discount
2
SHOECXPHZSFQEZ;Anand Archies Boots;["Footwear >> Women's Footwear >> Casual Shoes >> Boots"];499;499;Anand Archies
SHOECKEYCF73BXZ;Do Bhai Boots;["Footwear >> Women's Footwear >> Casual Shoes >> Boots"];799;699;Do Bhai Boots;BigCom
SHOEAACYWEAF5U5;Bonzer Boots;["Footwear >> Women's Footwear >> Casual Shoes >> Boots"];999;499;Bonzer Boots;BigComp
SHOEBN3FFYG75P3D;DJH Boots;["Footwear >> Women's Footwear >> Casual Shoes >> Boots"];999;499;DJH Boots;BigCompany
SHOESTZMQHKW67TT;Selfie Black Denim Boots;["Footwear >> Women's Footwear >> Casual Shoes >> Boots"];1000;499;Selfie
SHOEDH9A548SSF8T;Myra Comfortable Boots;["Footwear >> Women's Footwear >> Casual Shoes >> Boots"];1049;499;Myra Comf
SHOEBYNS24ZRNQPU;Sam Stefy Boots;["Footwear >> Women's Footwear >> Casual Shoes >> Boots"];1050;449;Sam Stefy Boots;
SHOEJWAY2BFHT6BS;Zappy Boots;["Footwear >> Women's Footwear >> Boots >> Zappy Boots"];1199;899;Key Features of Zappy
SHOE4UC3MJZF3VFJ;Lyc White Casual Boots;["Footwear >> Women's Footwear >> Casual Shoes >> Boots"];1199;899;Lyc White
SHOEC5WQCEZRR2X;Selfie Boots;["Footwear >> Women's Footwear >> Casual Shoes >> Boots"];1200;599;Selfie Boots;BigCom
SHOEC5WQHDGU3DUC;Selfie Boots;["Footwear >> Women's Footwear >> Casual Shoes >> Boots"];1200;599;Selfie Boots;BigCom
```

Sorting results by discounting price

```
According to what would you like to sort?
1) Name
2) Price
3) Discount
3
SHODUMFYMBZHSJB5;Salt N Pepper 13-516 Greta Red Boots;["Footwear >> Women's Footwear >> Casual Shoes >> Boots"];3495;2621;Salt N Pepper 13-516 G
SHOEJURGNFYXGDP;Get Glamr Stylish Boots;["Footwear >> Women's Footwear >> Casual Shoes >> Boots"];1999;499;Get Glamr Stylish Boots - Buy Get Gl
SHOEC57B86SEPW6;Kialz Boots;["Footwear >> Women's Footwear >> Casual Shoes >> Boots"];2999;2399;Kialz Boots - Buy Kialz Boots - 222-5 only for A
SHOEDH9A548SSF8T;Myra Comfortable Boots;["Footwear >> Women's Footwear >> Casual Shoes >> Boots"];1049;499;Myra Comfortable Boots - Buy Myra Com
SHOEC5WQCEZRR2X;Selfie Boots;["Footwear >> Women's Footwear >> Casual Shoes >> Boots"];1200;599;Selfie Boots;BigCompany
SHOEEY2P2FZ7B7V;Get Glamr Designer Brogue Boots;["Footwear >> Men's Footwear >> Casual Shoes >> Get Glamr Casual Shoes"];2499;1999;Get Glamr Des
SHOEBYMY25VQ6NT;Arstoreindia Boots;["Footwear >> Men's Footwear >> Casual Shoes >> Arstoreindia Casual Shoes"];3199;1599;Arstoreindia Boots;Big
SHOEFMRJZKHJREH;Kialz Ladies Boots;["Footwear >> Women's Footwear >> Casual Shoes >> Boots"];2299;899;Kialz Ladies Boots - Buy Kialz Ladies Boot
SHOEF96X3S66H;Kialz Ladies Boots;["Footwear >> Women's Footwear >> Casual Shoes >> Boots"];1999;999;Kialz Ladies Boots - Buy Kialz Ladies Boot
SHOEFHKKH6ZQOFY;200resses Brown Shiver Me Timbers Boots;["Footwear >> Women's Footwear >> Casual Shoes >> Boots"];2795;2795;200resses Brown Shi
SHOEFMRZZEBCEJT;Kialz Ladies Boots;["Footwear >> Women's Footwear >> Casual Shoes >> Boots"];2799;1299;Kialz Ladies Boots - Buy Kialz Ladies Boot
SHOENJY2X4UE6TM;Digni Boots;["Footwear >> Women's Footwear >> Boots >> Digni Boots"];1699;849;Key Features of Digni Boots Womens Boots Party wea
SHOE4UC3MJZF3VFJ;Lyc White Casual Boots;["Footwear >> Women's Footwear >> Casual Shoes >> Boots"];1199;899;Lyc White Casual Boots - Buy Lyc White
SHOECBN4Q6ZECV6;Carlton London Boots;["Footwear >> Women's Footwear >> Casual Shoes >> Boots"];1995;1995;Carlton London Boots - Buy Carlton Lond
SHOECXPHZSFQEZ;Anand Archies Boots;["Footwear >> Women's Footwear >> Casual Shoes >> Boots"];499;499;Anand Archies Boots - Buy Anand Archies Bo
SHOEE3GGSRHMGVQ;99Moves MOV-249-9 Boots;["Footwear >> Men's Footwear >> Casual Shoes >> 99Moves Casual Shoes"];3000;1640;99Moves MOV-249-9 Boots
SHOED5DC2GSMQ6H;Rialto Boots;["Footwear >> Women's Footwear >> Casual Shoes >> Boots"];3295;2395;Rialto Boots - Buy Rialto Boots - rialto-A1026
SHOEDH5R5F4PMGA;Credos Boots;["Footwear >> Women's Footwear >> Casual Shoes >> Boots"];4499;3499;Credos Boots - Buy Credos Boots - 999916200-ne
```

Filtering upper and lower bound

```

What would you like to filter by
1) Price
2) Category
3
1) filter with lower bound
2) filter with upper bound
3) filter with upper and lower bound
3
Enter the lower bound: 1000
Enter the upper bound: 2000
SH0EDH9AS4SSFBT;Myra Comfortable Boots;["Footwear >> Women's Footwear >> Casual Shoes >> Boots"];1049;499;Myra Comfortable Boots - Buy Myra
SH0EBVMSZ4ZRMQU;Sam Stefy Boots;["Footwear >> Women's Footwear >> Casual Shoes >> Boots"];1050;449;Sam Stefy Boots;BigCompany
SH0EJWAVZBFHTGBS;Zappy Boots;["Footwear >> Women's Footwear >> Boots >> Zappy Boots"];1109;899;Key Features of Zappy Boots Material: Nubuck L
SH0E4UC3MZF3VFJ;Lyc White Casual Boots;["Footwear >> Women's Footwear >> Casual Shoes >> Boots"];1109;899;Lyc White Casual Boots - Buy Lyc W
SH0ECSM9H0GUJDU;Selfie Boots;["Footwear >> Women's Footwear >> Casual Shoes >> Boots"];1200;599;Selfie Boots;BigCompany
SH0ECV4SKFBNBQ;Selfie Boots;["Footwear >> Women's Footwear >> Casual Shoes >> Boots"];1200;599;Selfie Boots - Buy Selfie Boots - Selfie-SEE
SH0ECSM9CZRR8Z;Selfie Boots;["Footwear >> Women's Footwear >> Casual Shoes >> Boots"];1200;599;Selfie Boots;BigCompany
SH0ECD7Y2Q4ZRD;CatBird Boots;["Footwear >> Women's Footwear >> Casual Shoes >> Boots"];1399;999;CatBird Boots - Buy CatBird Boots - AB-04 c
SH0EJVGTSYMFYFB;Zappy Boots;["Footwear >> Women's Footwear >> Boots >> Zappy Boots"];1399;719;Key Features of Zappy Boots Material: Nubuck L
SH0EBKEYSKS7GK;Shuz Touch Boots;["Footwear >> Women's Footwear >> Casual Shoes >> Boots"];1409;1270;Shuz Touch Boots - Buy Shuz Touch Boots
SH0EBF3XDQAFBZ;Arstoreindia Boots;["Footwear >> Men's Footwear >> Casual Shoes >> Arstoreindia Casual Shoes"];1499;699;Arstoreindia Boots;E
SH0EBEYHTHTVONL;Shuz Touch Boots;["Footwear >> Women's Footwear >> Casual Shoes >> Boots"];1409;1270;Shuz Touch Boots - Buy Shuz Touch Boots
SH0EJWMSDZCZPH3;Delberto Boots;["Footwear >> Women's Footwear >> Boots >> Delberto Boots"];1409;1399;Key Features of Delberto Boots Rain Bo
SH0E4JCEZDRSH4S;Willy Winkies Black Boots;["Footwear >> Women's Footwear >> Casual Shoes >> Boots"];1499;999;Willy Winkies Black Boots;BigCo
SH0E4HKYRFFHCJWX;J.D.H. 111-222 Boots;["Footwear >> Women's Footwear >> Casual Shoes >> Boots"];1500;599;J.D.H. 111-222 Boots - Buy J.D.H. 11

```

Ordering a product

```

SH0E356K9ZRUHWSN;Kielz Ladies Boots;["Footwear >> Women's Footwear >> Casual Shoes >> Boots"];1999;999;Kielz Ladies Boots - Buy Kielz Ladies Boots
SH0E3URGKNFYXDGP;Get 6Lamr Stylish Boots;["Footwear >> Women's Footwear >> Casual Shoes >> Boots"];1999;499;Get 6Lamr Stylish Boots - Buy Get 6L
SH0EDM6EUGKWF5MZ;People Boots;["Footwear >> Men's Footwear >> Casual Shoes >> People Casual Shoes"];1999;1999;People Boots - Buy People Boots - T
1) Sorting
2) Filtering
3) Order
0) Go to previous menu
3
Enter the product ID which will be ordered: SH0E3URGKNFYXDGP
The order was successful
1) Sorting
2) Filtering
3) Order
0) Go to previous menu

```

Trader login to system

```

Welcome to E-Shopping application
User Id:(Exit-> -1) 00000001
Password: 000001
Welcome BigCompany
1) Add a product
2) Remove a product
3) Edit a product
4) Display orders
0) Exit
4
1) See List of Orders
2) Accept Order
3) Cancel Order
1
Product ID  User ID  Trader Name
SH0E3URGKNFYXDGP  00000000  BigCompany

```

Trader accept the order

```
1) Add a product
2) Remove a product
3) Edit a product
4) Display orders
0) Exit
4
1) See List of Orders
2) Accept Order
3) Cancel Order
2
Which order will be accepted? Enter its product ID: SHOE3URGNMFYXDGP
Product sold successfully
1) Add a product
2) Remove a product
3) Edit a product
4) Display orders
0) Exit
|
```

Trader adds a product

```
1) Add a product
2) Remove a product
3) Edit a product
4) Display orders
0) Exit
1
Please enter product's ID: 4646
Please enter product's name: shoes
Please enter product's category: shoes >> women's shoes
Please enter product's price: 1000
Please enter product's discounted price: 900
Please enter product's description: shoes,women,free shipping
1) Add a product
```

Trader removes a product

```
1) Add a product
2) Remove a product
3) Edit a product
4) Display orders
0) Exit
2
Enter the ID of product which will be deleted:4646
```

Try to edit not valid product id

```
1) Add a product
2) Remove a product
3) Edit a product
4) Display orders
0) Exit
2
Enter the ID of product which will be deleted: 4646
1) Add a product
2) Remove a product
3) Edit a product
4) Display orders
0) Exit
3
Enter the ID of product which will be edited: 4646
There is no such product with this ID
1) Add a product
2) Remove a product
3) Edit a product
4) Display orders
0) Exit
1
```

Try to edit valid product

```
1) Add a product
2) Remove a product
3) Edit a product
4) Display orders
0) Exit
3
Enter the ID of product which will be edited: VANEABFPKGGZTYVQ
Which feature of the product you want to change?
1) Name
2) Price
3) Discounted price
4) Description
2
Enter the new price:
399
1) Add a product
2) Remove a product
3) Edit a product
4) Display orders
0) Exit
```

