

CSE222

DATA STRUCTURES AND

ALGORITHMS

HOMEWORK 6 REPORT

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A) Problem Solution Approach

- There are two classes named Products and Users.
- There are 3 files named "products.txt", "orders.txt", "users.txt". There is also a file called "temp.txt" for temporary operations..
- All information in the csv is kept in the "products.txt" file.
- The information of users and traders is kept in the "users.txt" file.
- Order information is kept in the "orders.txt" file.

Program Flow and Tests

```
CHOOSE HOW YOU WANT TO TEST THE CODE
1- With Driver Code
2- With User Input
Choose... 2
```

When the program is run, this menu appears.

When "Driver" is selected, test cases run automatically. If "User Input" is selected, program runs interactively.

- Below are interactive test results

```
-----WELCOME-----
1- LOGIN
2- EXIT
Choose... 1
Enter ID: 10000002
Enter PASSWORD: 123456
Log in successful.

MENU FOR CUSTOMERS
1- Search products with name
2- Show all products of a trader
```

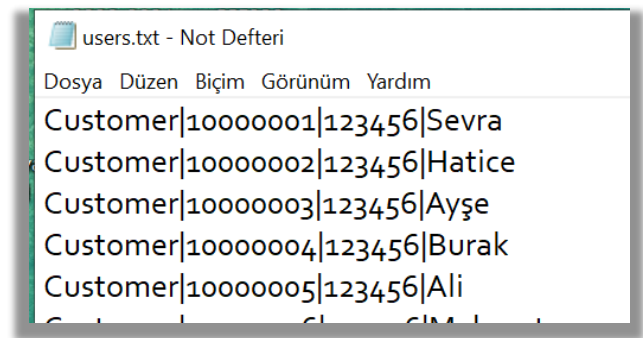
Customers and Traders' information is kept in the 'users.txt' file.

All users have userType, ID, password and name information respectively.

In order to facilitate the tests, I listed the ID numbers of the Customers from 10000001, starting from the ID numbers of the Traders from 50000001. Likewise, I gave a simple password.

```
Trader|50000001|654321|Alisha
Trader|50000002|654321|FabHomeDecor
Trader|50000003|654321|BigCompany
Trader|50000004|654321|Sicons
Trader|50000005|654321|Eternal Gandhi
Trader|50000006|654321|dilli bazaaar
Trader|50000007|654321|Ladela
Trader|50000008|654321|Carrel
```

Duplication was not allowed while traders were added to the file. Each store is added to a file only once..



Customers and traders can log in to the system by entering their ID and PASSWORD. They come across their own menus.

```
Enter ID: 1234567
ERROR - ID must be 8 character!
```

ID has to be 8 characters

Password has to be 6 characters

```
Enter PASSWORD: 12345678
ERROR - PASSWORD must be 6 character!
```

```
Enter ID: 10000001
Enter PASSWORD: 233333
Login failed. Check the informations.
```

If the entered information does not match with the system, it will give an error.

✓ CUSTOMER MENU

```
MENU FOR CUSTOMERS
1- Search products with name
2- Show all products of a trader
1
Enter the product name you wanted to search...Cycling
```

MENÜ 1

After entering the system as Customer, this menu appears.

If the customer wants to search for a product by entering a word, he chooses 1. Then he enters the word. If the word is in the name or description of the product, the product is printed.

```
1- Select sorting type
2- Sort default
3- Narrow the search by price range
4- Narrow the search by entering category
Choose...1
```

MENÜ 2

Before that, the customer must choose how the products will be printed.

a) if customer wants to see the products sorted

```
1- Show in decreasing order of the product name
2- Show in decreasing order of the price
3- Show in increasing order of the price
4- Show in decreasing order of the discount percentage
5- Show in increasing order of the discount percentage
1
```

This menu appears, and customer choose the sort type

A few examples:

1)Decreasing Order by Name

```
[1]
Product ID:SRTEH2FF9KEDEF6F
Product Name:Alisha Solid Women's Cycling Shorts
Product Description:Key Features of Alisha Solid Women's Cycling Shorts Cotton Lycra Na
Product Trader:Key Features of Alisha Solid Women's Cycling Shorts Cotton Lycra Na
Product Price:999
Product Discounted Price:379
```

```
[14]
Product ID:SRTEGWKJHSHWTCYG
Product Name:Mynte Solid Women's Cycling Shorts, Gym Shorts, Swim Shorts
Product Description:Key Features of Mynte Solid Women's Cycling Shorts, Gym Short
Product Trader:Key Features of Mynte Solid Women's Cycling Shorts, Gym Shorts, S
Product Price:1499
Product Discounted Price:649
```

```
[27]
Product ID:G06EHZ5PKPZJG38Y
Product Name:Quoface Day And Night Vision Car And Bike Driving C
Product Description:Key Features of Quoface Day And Night Vision
Product Trader:Key Features of Quoface Day And Night Vision Car A
Product Price:1398
Product Discounted Price:450
```

(The order in which it was printed can be seen from the indexes)

2)Decreasing Order by Price

```
[1]
Product ID:SRTEGWKMPXHHN4MF
Product Name:Mynte Solid Women's Cycling Shorts, Gym Shorts, Swim Shorts
Product Description:Specifications of Mynte Solid Women's Cycling Shorts, Gym Shorts
Product Trader:Mynte
Product Price:2495 ←
Product Discounted Price:949
```

```
[10]
Product ID:SRTEGWKKXGGSERKZ
Product Name:Mynte Solid Women's Cycling Shorts, Gym Shorts, Swim Shorts
Product Description:Key Features of Mynte Solid Women's Cycling Shorts, Gym
Product Trader:Mynte
Product Price:1499 ←
Product Discounted Price:649
```

```
[28]
Product ID:SRTEH2F6HUZMQ6SJ
Product Name:Alisha Solid Women's Cycling Shorts
Product Description:Key Features of Alisha Solid Women's Cycling Shorts Cotton Lycra Bla
Product Trader:Alisha
Product Price:699 ←
Product Discounted Price:267
```

3)Increasing Order Discount Amount Percentage

```
[1]
Discount Percentage:56 ←
Product ID:SRTEGWKKZNUYX7HW
Product Name:Mynte Solid Women's Cycling Shorts, Gym Shorts, Swim Shorts
Product Description:Key Features of Mynte Solid Women's Cycling Shorts, Gym Shorts, Swim Shorts
Product Trader:Mynte
Product Price:1499
Product Discounted Price:649
```

```
[18]
Discount Percentage:61 ←
Product ID:SH0EHE7C7X5FZYMF
Product Name:Knight Ace Kraasa Sports Running Shoes, Cycling Shoes, Walking Shoes
Product Description:Key Features of Knight Ace Kraasa Sports Running Shoes, Cycling Shoes, Walking
Product Trader:Knight Ace
Product Price:1299
Product Discounted Price:499
```

```
[26]
Discount Percentage:67 ←
Product ID:60GEH25PKPZJG38Y
Product Name:Quoface Day And Night Vision Car And Bike Driving Cycling Goggles
Product Description:Key Features of Quoface Day And Night Vision Car And Bike Driv
Product Trader:Quoface
Product Price:1398
Product Discounted Price:450
```

Discount percentage
was calculated and
printed at first.

Let's go back to menu 2

```
1- Select sorting type
2- Sort default
3- Narrow the search by price range
4- Narrow the search by entering category
```

Option 2 prints products in order in the file.

The 3rd option is used to filtered the prices of the products.

MENÜ 2

If you choose 3, this menu will appear.

```
Choose...3
1- Lower threshold
2- Upper threshold
3- Upper and Lower threshold
```

MENÜ 4

- If you choose 1 in menu 4, you can filter the products by entering the lower threshold.

```
1- Lower threshold
2- Upper threshold
3- Upper and Lower threshold
1
Enter the lower threshold... 1000
```

```
[24]
Product ID:G0GEJ88FJUGSVM4K
Product Name:Quoface Day and Night Vis
Product Description:Quoface Day and N
Product Trader:BigCompany
Product Price:1398
Product Discounted Price:450
```

```
[1]
Product ID:SRTEH2FVVKRBAXHB
Product Name:Alisha Solid Women's C
Product Description:Key Features of
Product Trader:Alisha
Product Price:1199
Product Discounted Price:479
```

(only products that cost more than 1000 lira are listed)

- If you choose Option 2, you can filter the products by entering upper threshold.

```
2
Enter the upper threshold... 1000
[1]
Product ID:SRTEH2FF9KEDEF6F
Product Name:Alisha Solid Women's Cycling Shorts
Product Description:Key Features of Alisha Solid Women's C
Product Trader:Alisha
Product Price:999
Product Discounted Price:379
```

(Only products less than
1000 TL are displayed)

```
[2]
Product ID:SRTEH2F6HUZMQ6SJ
Product Name:Alisha Solid Women's Cycling Shorts
Product Description:Key Features of Alisha Solid Women's
Product Trader:Alisha
Product Price:699
Product Discounted Price:267
```

- If you select the 3rd option, you can filter by entering both upper and lower threshold.

```
[17]
Product ID:SRTEGWKHXHCF2TME
Product Name:Mynte Solid Women's Cycling Shorts, Gym Short
Product Description:Key Features of Mynte Solid Women's Cy
Product Trader:Mynte
Product Price:1995
Product Discounted Price:849
```

Only products between 1000-
2000 TL are shown

```
3
Enter the lower threshold... 1000
Enter the upper threshold... 2000
[1]
Product ID:SRTEH2FVVKRBAXHB
Product Name:Alisha Solid Women's Cycling Shorts
Product Description:Key Features of Alisha Solid Women's Cyc
Product Trader:Alisha
Product Price:1199
Product Discounted Price:479
```

Let's Go back to Menu1

```
MENU FOR CUSTOMERS
1- Search products with name
2- Show all products of a trader
2
Enter the name of the trader... Alisha
```

```
-----All Products of Alisha Store-----
[1]
Product ID:SRTEH2FF9KEDEF6F
Product Name:Alisha Solid Women's Cycling Sh
Product Description:Key Features of Alisha S
Product Trader:Alisha
Product Price:999
Product Discounted Price:379
```

(continues)

If we want to display all products of a trader instead of searching by word, we will choose Option 2 and enter a trader name

Another trader example:

```
MENU FOR CUSTOMERS
1- Search products with name
2- Show all products of a trader
2
Enter the name of the trader... 999store

-----All Products of 999store Store-----
[1]
Product ID:STIE2FRBYC92E2C
Product Name:999store Medium Paper Sticker
Product Description:Buy 999store Medium Paper St
Product Trader:999store
Product Price:999
Product Discounted Price:599
```

All products in the entered store are printed on the screen in order.

After all the product prints printed above, the following question is asked.

```
Enter the index of the product you wanted to buy... |
```

```
[21]
```

```
Product ID:STIE2FRB8JYC6K8H
Product Name:999store Medium
Product Description:Buy 999s
Product Trader:999store
Product Price:999
```

Indexes are numbers specified in square brackets at the beginning of the printed product.

The customer can start the order process by entering the index of the product she wants to buy.

Order example

After the customer enters the index of the product he wants to buy, he creates his order by entering the address and telephone number.

```
Enter the index of the product you wanted to buy... 15
Enter the delivery address: Çamlıca Mahallesi Söğüt Sokak No:1/4 Üsküdar/İSTANBUL
Enter the phone number: 5077134665
```

Orders are kept in the orders.txt file

'Not-approved' means the order has not yet been confirmed and canceled by the store

```
[15]
Product ID:STIE2FRB6MZ8JXBZ
Product Name:999store Medium Paper Sticker
Product Description:Buy 999store Medium Paper Sticker for Rs.599 online.
Product Trader:999store
Product Price:999
Product Discounted Price:599
```

```
orders.txt - Not Defteri
Dosya Düzen Biçim Görünüm Yardım
not-approved|10000001|5077134665|999|599|999store Medium Paper Sticker|Çamlıca Mahallesi Söğüt Sokak No:1/4 Üsküdar/İSTANBUL|
```

✓ TRADER MENU

```
Enter ID: 500000002
Enter PASSWORD: 654321
Log in successful.
```

```
MENU FOR TRADERS
1- Add Product
2- Remove Product
3- Edit Product
4- List of Orders
5- Manage Orders
```

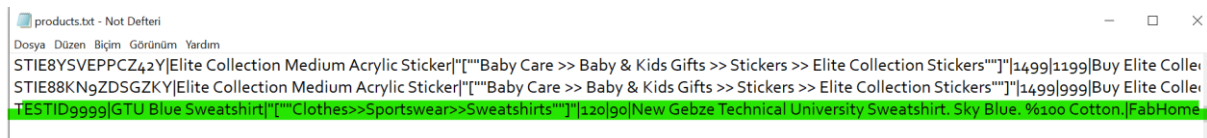
```
users.txt - Not Defteri
Dosya Düzen Biçim Görünüm Yardım
Customer|10000013|123456|Betül|
Customer|10000014|123456|Ceyda
Trader|50000001|654321|Alisha
Trader|50000002|654321|FabHomeDecor
Trader|50000003|654321|BigCompany
Trader|50000004|654321|Sicons
Trader|50000005|654321|Eternal Candy
```

-We entered the system as a FabHomeDecor trader

1)add product

```
1
To add a new product, enter the following information completely...
ID: TESTID9999
Name: GTU Blue Sweatshirt
Hierarchical Category: Clothes>>Sportswear>>Sweatshirts
Price: 120
Discount amount: 90
Description: New Gebze Technical University Sweatshirt. Sky Blue. %100 Cotton.
```

After entering the ID, name, category price and discounted price information, the product is added to the system.

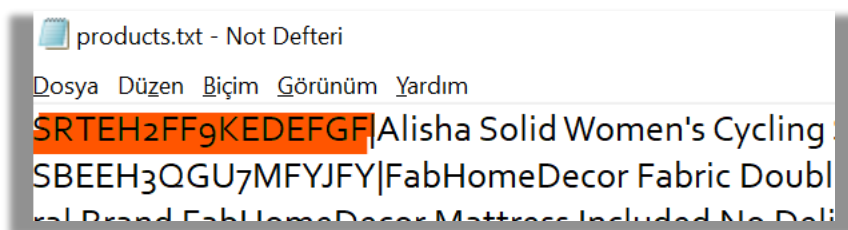


As you can see, the product has been placed in the 'products.txt' file as belonging to FabHomeDecor store.

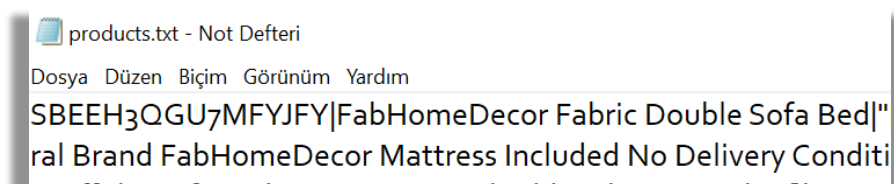
2)remove product

This process is done with the product id.

```
2
Enter the ID of the product to be removed: SRTEH2FF9KEDEF6F
```



When you enter the id of the product you want to remove, it is deleted from the 'products.txt' file.



After removing

3)edit product

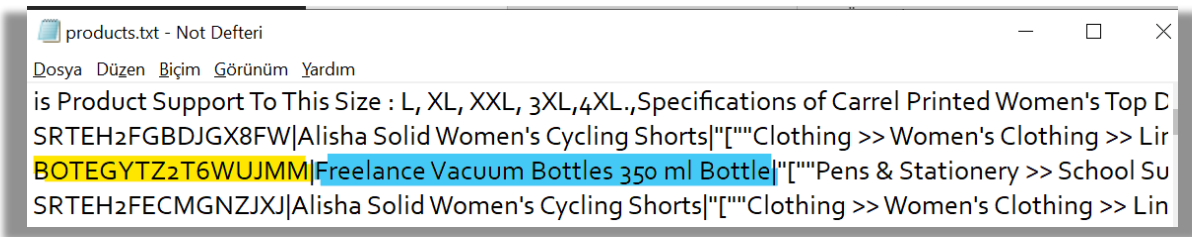
The editing process is done by entering the id number of the product.

```
1- Edit Name
2- Edit Description
3- Edit Price
4- Edit Discounted Price
Choose... 1
Enter the updated data: NAME EDIT TEST
DATECONVERT/11/11/2022
```

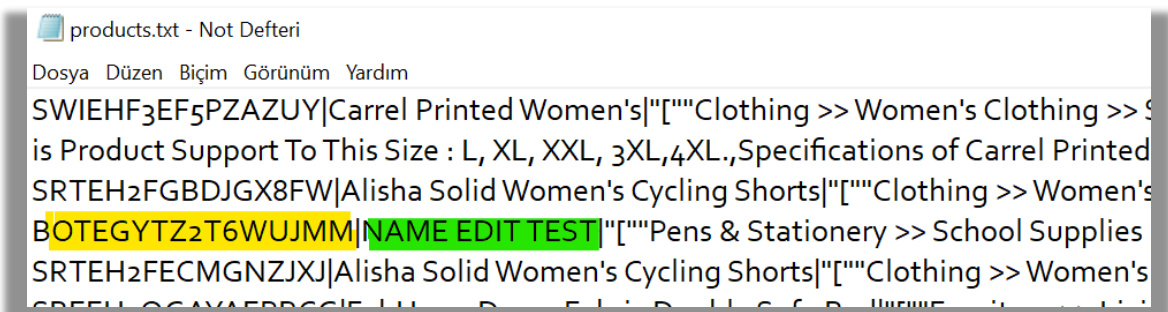
After the ID is entered, what you want to change is selected

As an example, let's change the 'name' information.

Before Edit



After Edit



4)list orders

```
5- Manage Orders
```

	Process	Customer ID	Phone	Price	Disc.Price	Name	Address
1	not-approved	10000001	5326789878	0888	500	Alisha Solid Women's Cycling Shorts	Cumhuriyet Mahallesi Kuru S
2	not-approved	10000004	5062416523	0799	699	Alisha Solid Women's Dress	Küplüce Mahallesi Yetkin Sokak 23/2
3	not-approved	10000005	5078912367	0280	200	Style Foot Bellies	Seren Mahallesi Tekin Sokak 2/3
4	not-approved	10000007	5078912341	3333	100	Alisha Solid Women's Cycling Glasses	Barbaros Mahallesi Tuf
5	not-approved	10000008	5354768989	0222	215	Alisha Solid Women's Cycling Shorts	Kandilli Mahallesi Zafer So
6	not-approved	10000001	5077134778	0699	400	Carrel Printed Women's	Kuzguncuk Mahallesi Kar Sokak 3/1

5)managing orders

The order to be processed is selected from the order list. Index is written.

```
MENU FOR TRADERS
1- Add Product
2- Remove Product
3- Edit Product
4- List of Orders
5- Manage Orders
5
```

	Process	Customer ID	Phone	Price	Disc.Price	Name
1	not-approved	10000001	5326789878	0888	500	Alisha Solid Women'
2	not-approved	10000004	5062416523	0799	699	Alisha Solid Women'
3	not-approved	10000005	5078912367	0280	200	Style Foot Bellies
4	not-approved	10000007	5078912341	3333	100	Alisha Solid Women'
5	not-approved	10000008	5354768989	0222	215	Alisha Solid Women'
6	not-approved	10000001	5077134778	0699	400	Carrel Printed Wome

Enter the index of order you wanted to process...

Then 'meet' or 'cancel' action is selected. And the order list is updated according to the selected situation.

Example meet process

```
1- Meet the Order
2- Cancel the Order
1
```

Situation	CustomerID	PhoneNumber	Prc	D.prc	Name	Address
approved	10000007	5078912341	3333	100	Alisha Solid Women's Cycling Glasses	Barbaros Mahallesi Tuf Sokak 5/8

Example cancel process

```
1- Meet the Order
2- Cancel the Order
2
```

Situation	CustomerID	PhoneNumber	Prc	D.prc	Name	Address
canceled	10000004	5062416523	0799	699	Alisha Solid Women's Dress	Küplüce Mahallesi Yetkin Sokak 23/2

Updated order list

	Process	Customer ID	Phone	Price	Disc.Price	Name	Address
1	not-approved	10000001	5326789878	0888	500	Alisha Solid Women's Cycling Shorts	Cumhuriyet Mahallesi Kuru S
2	canceled	10000004	5062416523	0799	699	Alisha Solid Women's Dress	Küplüce Mahallesi Yetkin Sokak 23/2
3	not-approved	10000005	5078912367	0280	200	Style Foot Bellies	Seren Mahallesi Tekin Sokak 2/3
4	approved	10000007	5078912341	3333	100	Alisha Solid Women's Cycling Glasses	Barbaros Mahallesi Tuf Sokak
5	not-approved	10000008	5354768989	0222	215	Alisha Solid Women's Cycling Shorts	Kandilli Mahallesi Zafer Sok
6	not-approved	10000001	5077134778	0699	400	Carrel Printed Women's	Kuzguncuk Mahallesi Kar Sokak 3/1

DATA STRUCTURES

✓ ArrayList

```
public ArrayList<String> traderList;  
public ArrayList<String> list;  
private int numOfTraders=0;
```

Arraylist was used to keep lists like traderList, list.

```
ArrayList<ArrayList<ArrayList<Integer>>> discPerc = new ArrayList<>(list.size());
```

I used 3D arraylist to keep the price and the sale price of the product and calculate the discount percentage.

✓ LinkedList

```
private TreeNode root;  
private LinkedList<String> printed;
```

While printing some products, I kept the id numbers in the linked list to avoid confusion due to the name similarity.

✓ HashTable

```
Hashtable<Integer, String> hash = new Hashtable<>();  
for(int i=0; i<list.size(); i++){
```

I used HashTable when sorting products by name.

✓ Tree

```
public class TreeNode {  
    String val;  
    List<TreeNode> children = new LinkedList<>();  
    TreeNode(String data) { val = data; }  
    TreeNode(String data, List<TreeNode> child) {  
        val = data;  
        children = child;  
    }  
}
```

I tried to create a tree structure myself and keep the categories there.

✓ Queue

```
if(root == null) return;  
Queue<TreeNode> queue = new LinkedList<>();  
queue.offer(root);
```

I used Queue to suppress the tree where I keep the categories.

A) Class Diagrams

Products		
m	getTraderList()	ArrayList<String>
m	getNumOfTraders()	int
m	readCSV_writeTXT()	void
m	readTXT()	void
m	categorize()	void
m	addCategory(String[])	void
m	printNaryTree(TreeNode)	void
m	printCategories(TreeNode)	void
m	find(String)	boolean
m	findName(String)	void
m	searchWithName(String, int)	int
m	printWithDiscount(ArrayList<Integer>, ArrayList<String>)	void
m	pvt(LinkedList<String>, String)	boolean
m	calculatePercentage(int, int)	int
m	insertionSort(ArrayList<Integer>, int)	void
m	selectionSort(ArrayList<Integer>)	void
m	thresholds(String, int, int)	void
m	searchWithTraderName(String)	Products

Interactive		
m	mainMenu()	void
m	login()	void
m	traderMenu()	void
m	customerMenu()	void
m	buyInformations()	void

Users		
m	setName(String)	void
m	getName()	String
m	setID(String)	void
m	getID()	String
m	getUserType()	String
m	addCustomer(String, String, FileWriter)	void
m	addTrader(FileWriter, Products)	void
m	checkInfo(String, String)	boolean
m	addProduct()	void
m	writeToFile(String, String, String, String, String, String)	void
m	removeProduct(String)	void
m	updateFile(String, String)	void
m	findTheLine(String)	String
m	editProduct(String, int, String)	void
m	order(ArrayList<String>, int, String, String)	void
m	listOrder()	void
m	listOrder(int)	String
m	orderManaging(int, int)	void
m	removeFromFile(String)	void

Driver		
m	customerTest()	void
m	traderTest()	void