ONLINE SHOPPING SYSTEM
REPORT

NATIONAL HIGHER SCHOOL OF ARTIFICIAL INTELLIGENCE

2CP

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INTRODUCTION TO THE PROBLEM TREATED:

The Online Shopping System is a C++ program that simulates the costumers online shopping experience. The purpose of this program is to bring knowledge to students about uses of Abstract data types in a real-life project.

The problem solved in this project consists of conceptualizing a web-based internet shopping system that provides a different range of articles for online customers to deliver a user-friendly experience using the convenient ADT.
this project aims to highlight the advantages of online shopping for regular customers via using our designed system that provides them with the opportunity to buy any product at any given time along with home delivery. It is valid to be implemented by local shops as well as multinational firms to manage their services. Using hash tables, priority queues, vectors, AVL & BST trees, the program reduces the time consumed to search for items and enhances the client's experience and system optimization.

EXPLANATION OF THE DATA CHOSEN:

The dataset suggested was completely generated during the process of execution of the project, representing a list of items each one initialized by its unique ID, name, price and quantity.

Several tables are created for the manipulation of the data format chosen in a CSV file containing a table of the previously mentioned parameters.

Category	ID to be hashed	name	Price	Hashed index
men	1696680	White shirt - S	1500	97
men	1676437	White shirt - M	1500	24
men	1692052	White shirt - L	1500	80
men	1658681	White shirt - XL	1500	65

Figure 1.1: Men items details.

women	1453250	Denim Jacket - S	4300	19
women	1594756	Denim Jacket - M	4300	47
women	1196773	Denim Jacket - L	4300	8
women	1396541	Denim Jacket - XL	4300	54
women	1256819	Leather Jacket - S	5550	89

Figure 1.2: women items details.

kids	1648167	White shirt - 8y.o	1000	19
kids	1648170	White shirt - 10y.o	1000	19
kids	1649334	White shirt - 12y.o	1000	94
kids	1649335	Blue shirt - 8y.o	1000	49
kids	1649336	Blue shirt - 10y.o	1000	28

Figure 1.3: kids items details.

PAPER ORGANIZATION:

The rest of the document is divided into three main sections: the design choice solutions and the results,

1)- ADT REPRESENTATION WITH EXPLANATION:

PART A:

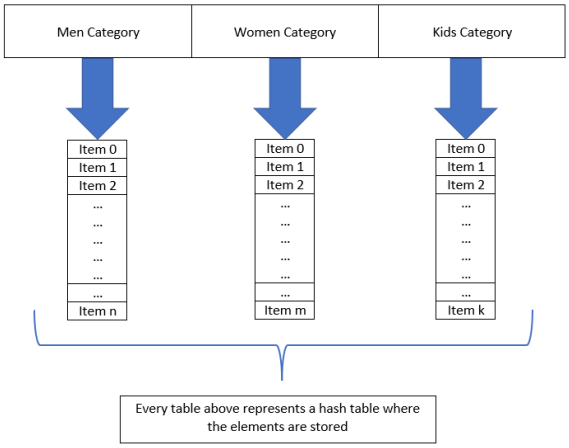

Figure 2.1: Hash table for every category.

We put the items that we have in a hash table because we want to have a constant time (or closer) while accessing to elements. To find the position of an element we used a hash function to hash the ID of each item which is displayed to the user in the menu enabling him to choose the item. And the collisions are handled using quadratic probing. The hashed ID is only used in the PART A of the program.

The program checks if the user is VIP by comparing the total amount of money spent on the items with 100 thousand dinars. If it's greater the user gets a membership and becomes a VIP member.

After a customer finishes his purchase and confirms it, we push into the first queue if he is a VIP, else it goes into the second one. We treat orders by popping from the first queue that contains the VIP users purchase then the second one that contains the basic users. (Shown in figure 2.2)

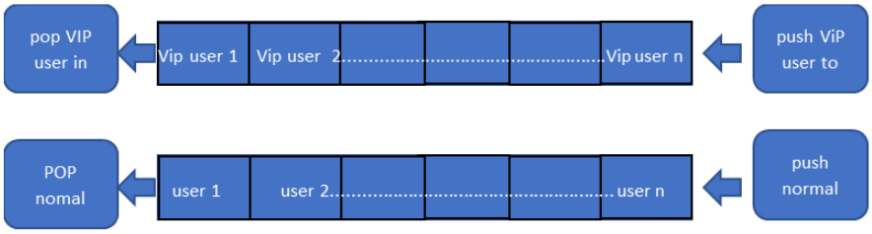

Figure 2.2: treating orders by priority

PART B and C:

In part B, the node includes the object (item), the customer inserts the specific ID of the article chosen from the menu , the find function takes it as a parameter and searches for its availability in the storage house (BST) in order to add it to cart, function addto cart pushes it into the queue.

In part C, the node includes the object item in addition to a private data member named itemkey that will be incremented in the insertion of each item from the file within the AVL starting at index 0 since the AVL is self balancing, the customer inserts now the appropriate key of item he wants to add it to cart , function find and add to cart execute the previously mentioned task.

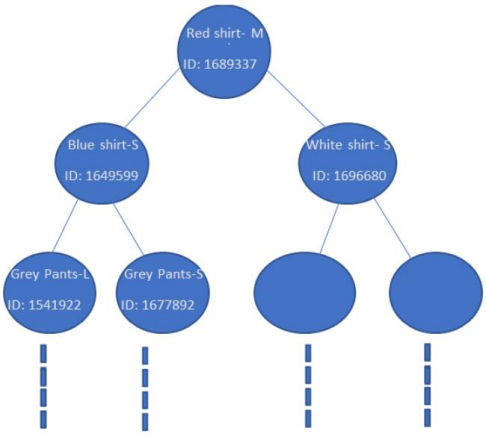

Figure 2.3: BST sample

2)-1- CASE TESTING:

Test condition	Test steps	Test input	Expected results	Actual results	status	comments

Check ability to sign up with password(8 characters)	1.Press on signUp 2.Enter name, Phone No, Adress, email, username and password	Larbi Saidchikh 0549326995 BEJAIA Larbi1512 Pw:Larbi2003	"You Signed up successfully!!"	"You Signed up successfully!!"	Pass	None
Check ability to sign up with password(less than 8 characters)	1.Press on signUp 2.Enter name, Phone No, Adress, email, username and password	Larbi Saidchikh 0549326995 BEJAIA Larbi1512 Pw: LS15	"You Signed up successfully!!"	"ENTER YOUR PASSWORD" appers again.	Unpass	The message appears until successful sign up
Check ability to login with incorrect pssword and username	**1** press on Login 2. Enter password and username	UserN: Larbi1512 PW:Larbi2002 UserN: Larbi1215 PW: Larbi2003		1.Enter password and username appears 3times 2. Sign up will appear	Unpass	After 3 unsuccessful trials, sign Up section will appear.
Check ID for item	Provide ID from the menu of items displayed when **"**Enter ID of item you want to add to your cart" appears	**Correct ID 89(women category)** **Uncorrect ID 19(women category)**	**"**Enter the quantity you want to buy"	**"**Enter the quantity you want to buy" **"**Enter ID of item you want to add to your cart"	**Pass** Unpass	ID message appears until a valid ID is submitted

Check credit card number, Expiry year and postal code	1. provide credit card number.(between 13 & 16 digits) -Expiry year (greater than 2022) 2. provide postal code (digits)	**Uncorrect Credit card number: 1245** **Expiry year:2022** **Postal code: Algiers**	Requesting credit card info "month: "appears "Thank you" message	**"**Enter your credit card Number please" appears again "Expiry year: " appears "Postal code: " appears again	Unpass	Resending the previous messages until valid input.
Menu selection	**1. "**SELECT an existing number in the menu	**Correct:** 1/ 2/ 3/ 4	List of items displayed by category	List of items displayedby category	pass	Selection appears again for invalid input
		Incorrect: Character or invalid digit	List of items displayed by category	**"**INVALID INPYUT TRY AGAIN" appears	unpass	
Program Efficiency	**1.** Impliment the program with huge data base	**List of ietms containing 110 700 items**	Program runs efficiently	**Program takes between 0.16 and 0.3 seconds.**	**Pass**	**none**
Check availablity of Items (quantity)	1.Enter the quantity you want to buy	**Correct: Input Quantity: 15 Available: 20**	**"**Do you want to buy more"	**"**Do you want to buy more"	pass	
		Incorrect: Input Quantity: 15 Available: 10	**"**Do you want to buy more"	**"** Sorry, we don't have enough quantity"	unpass	

2)2- RUNNING TIME COMPARAISON:

HashTable	**BST**	**AVL TREE**
171383 nanoseconds	**383937 nanoseconds**	**320 199 nanoseconds**

We conclude that the hashtable is the fastest ADT because it has direct access (search in O(1))

3)-GUIDELINES:

the main concept of the system is to facilitate the online shopping process, allowing customers to buy the desired items and benefit from shipping by following a set of basic steps, first of all the system shows the welcome page then the home screen pops up with 3 press buttons

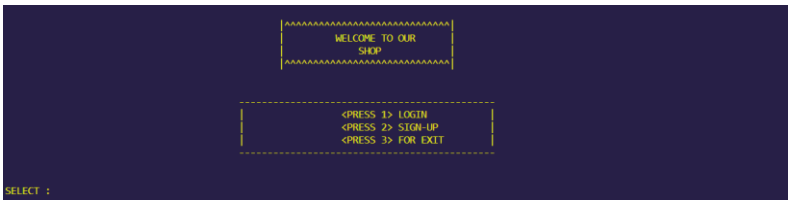

Figure 3.1: Home Page

SIGN UP: new visitors ought to create an account by providing essential details: name, phone number, password, username, address and postal code.

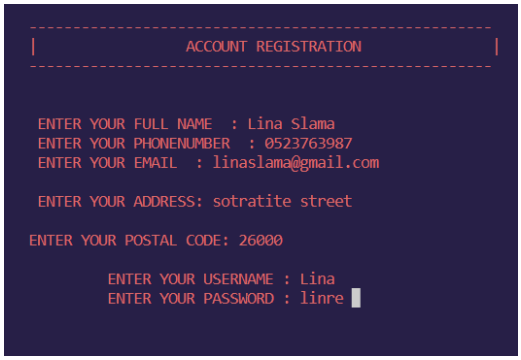

Figure 3.2: Registration Form (sign Up)

LOG IN: A user who already have an account, he must Login with his username and password after registration

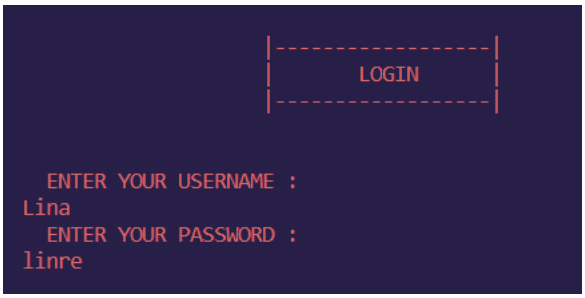

Figure 3.3: LOGIN

Choose a category: Once registered successfully, the user will have access to categories and has to choose one in order to view its items

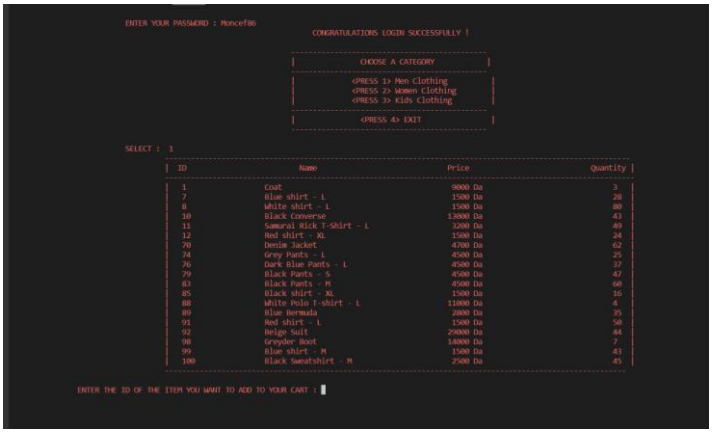

Figure 3.4: categories menu and products list

Purchase procedure: after selecting an article by inserting its index, the customer enters the quantity desired, then asked if he wants to continue shopping, if yes, the menu below will appear again

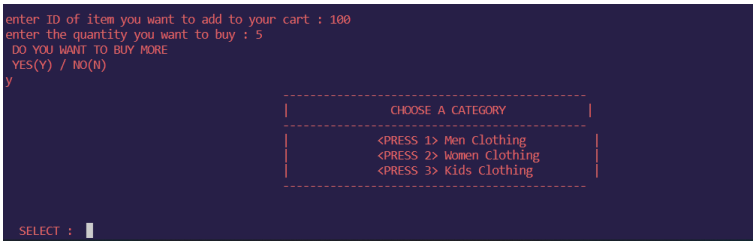

Figure 3.5: purchase procedure

Finally, the system will display the items bought in the cart, and user confirms his purchase.

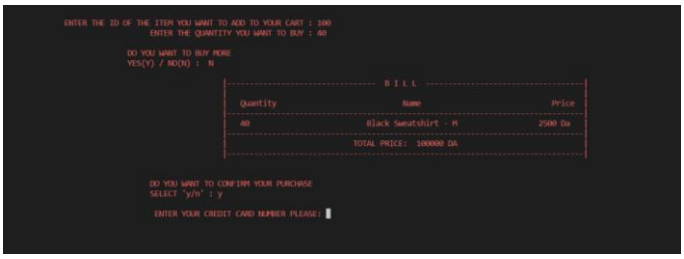

Figure 3.6: Bill

Confirm purchase: After confirming the items in the cart, the user submits his shipping address and credit card information.

```
ENTER YOUR CREDIT CARD NUMBER PLEASE: 125343325
EXPIRY DATE:
    MONTH : 12
    YEAR : 2023

ENTER YOUR ADRESS PLEASE:
            ADRESS NAME:  MEDEA
            POSTAL CODE:  26000
THANK YOU FOR YOUR VISIT
YOUR ITEMS WILL BE DELIVERED TO YOUR ADRESS SOON
HOPE TO SEE YOU AGAIN !! <3
```

Figure 3.7 : credit card information

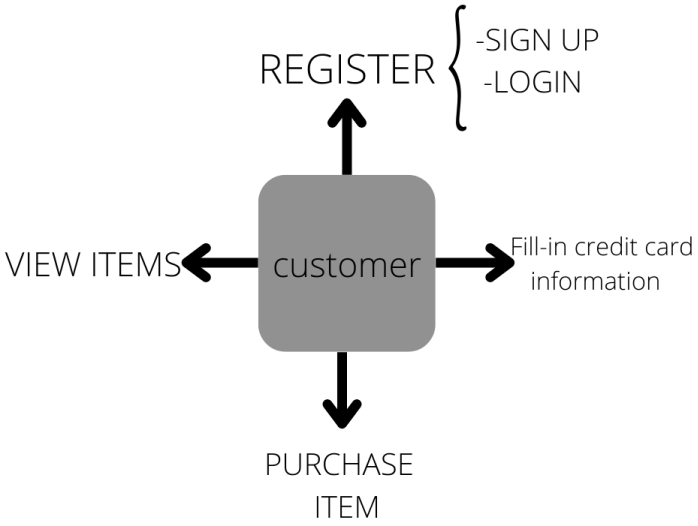

Figure 3.8 : User actions

Tasks of each member:

- SAIDCHIKH LARBI:
- Report writing and graphical representation
- Register class + menu class
- CHELLAL Abdelhak:
- All utility functions
- Debugging
- Perfectionizing the program interface
- Kadri Mouncef:
- ADTS implementation (hashing + part B and C)
- Generating and managing the dataset
- Reading and writing into the file

REFERENCES

GEEKFORGEEKS.com

Stackoverflow.com

Implementation aids from teachers