Overview: Inventory Management System

Group 1:

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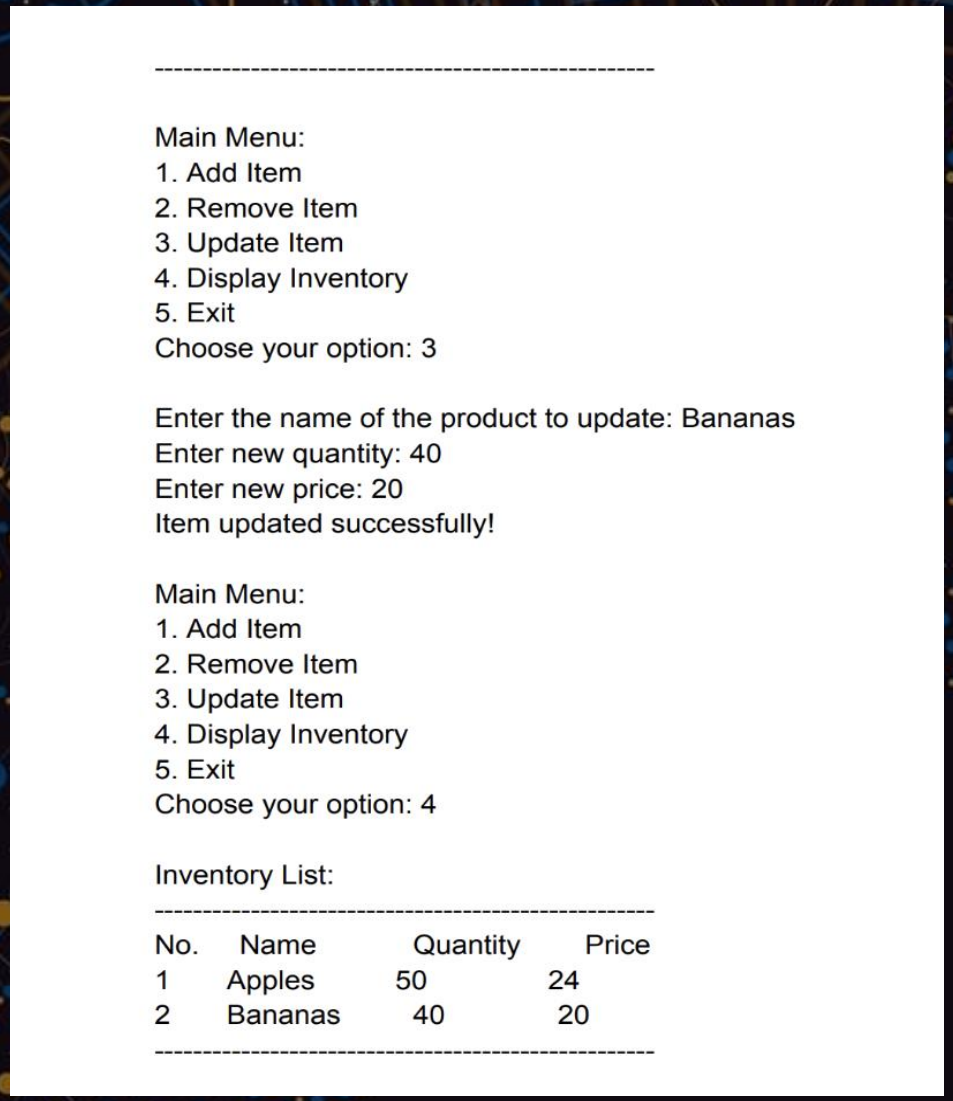
Introduction

The purpose of this project was to build an Inventory Management System while gradually updating it as we advanced through the course - transitioning from C to C++. Each week's deliverables (flowchart, source code, GenAI integration and analysis) were updated to achieve the ultimate product – an efficient program that keeps inventory of input products.

System Development: Week 4

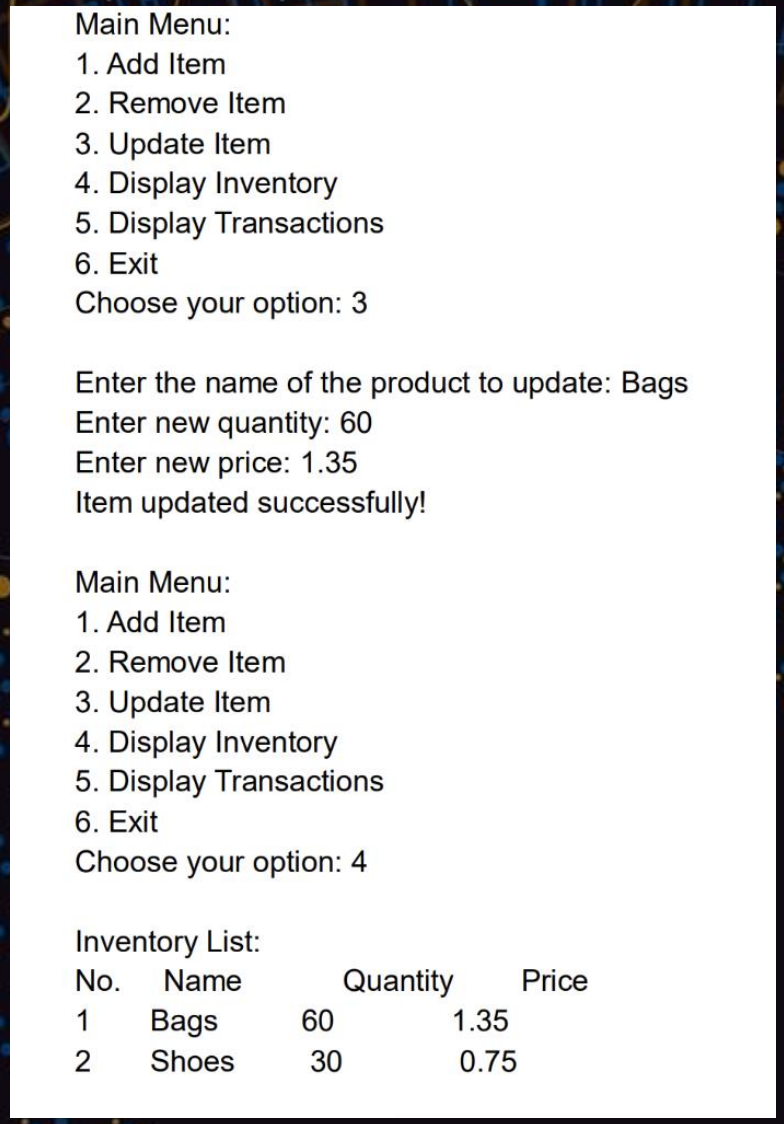
The program for the first stage was an elementary program written in C, using simple arrays and functions. The code relies heavily on functions which limits its scalability and error handling. The arrays have similar disadvantage of limited inputs and dynamic storage:



```
---------------------------------------------------

Main Menu:
1. Add Item
2. Remove Item
3. Update Item
4. Display Inventory
5. Exit
Choose your option: 3

Enter the name of the product to update: Bananas
Enter new quantity: 40
Enter new price: 20
Item updated successfully!

Main Menu:
1. Add Item
2. Remove Item
3. Update Item
4. Display Inventory
5. Exit
Choose your option: 4

Inventory List:
---------------------------------------------------
No.    Name          Quantity      Price
1      Apples        50            24
2      Bananas       40            20
---------------------------------------------------
```

System Development: Week 7

For week 7, we dynamically allocated memory and added linked lists and structs to our program in order to make it more memory-efficient and improve the trackability of the inventory. Now adding or removing products becomes more efficient as it avoids shifting all the elements (as in arrays):



System Development: Week 11

For week 11, we transitioned the code from C to C++. C++ was a much more efficient language with its Object-Oriented Design that provides inheritance, polymorphism, and abstraction. The introduction of Classes especially helped with the maintainability of the code:

```
Enter username: john
Enter password: pajdk

Login successful!

Main Menu:
1. Add Item
2. Remove Item
3. Update Item
4. Display Inventory
5. Display Transactions
6. Exit
Choose your option: 1

Enter product name: Apples
Enter quantity: 50
Enter price: 1.20

Transaction added: Apples - Added
Product added successfully!

Choose your option: 1
Enter product name: Bananas
Enter quantity: 30
Enter price: 0.80

Transaction added: Bananas - Added
Product added successfully!

Choose your option: 4

Inventory List:
No.     Name            Quantity        Price
1       Bananas                 30              0.80
2       Apples          50              1.20
```

System Development: Week 14

For week 14 and our final program, we took advantage of advanced features of C++ that helped enhance the code's reusability, readability, and error resilience among many improvements. Throughout the project, we also used the help of GenAI to identify potential errors and improve the structure of our code. The end result is a user-friendly and well – structured code.

```
1. Add Item
2. Remove Item
3. Display Inventory
4. Save Inventory
5. Load Inventory
6. Manage Orders
7. Exit
Choose: 1
Enter item type (Electronic/Perishable): Perishable
Enter name: Milk
Enter quantity: 50
Enter price: 2.5
Enter shelf life (days): 7
Item added successfully.

1. Add Item
2. Remove Item
3. Display Inventory
4. Save Inventory
5. Load Inventory
6. Manage Orders
7. Exit
Choose: 3
Inventory:
Electronic: Laptop 10 1200.99
        Warranty: 24 months
Perishable: Milk 50 2.5
        Shelf Life: 7 days
```

Conclusion

To conclude, our project spanning 14 weeks has helped us familiarize ourselves with the construction of usable programs such as IMS through programming with C and C++. As the program became more complex, the Data Structure Design played a bigger role in our program, prompting us to enhance the readability, scalability, and data organization of our code. In that regard, C++ was a better environment to improve our program and its efficiency.