School of Future Tech

Problem Statement Report

on

Inventory Management System using C++

by

Group-5

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1. Introduction

The Inventory Management System is a C++ application designed to digitize the tracking of product stock. Manual tracking often leads to data inaccuracies and financial losses; this system automates the recording, viewing, and selling of products to mitigate those risks.

2. Problem Statement

- **Manual Inefficiency**: Traditional paper-based or manual tracking causes stock discrepancies and financial losses.
- **The Solution**: A digital system that manages product IDs, names, quantities, and prices in a persistent database.

3. C++ Concepts Implemented

The project utilizes several core C++ concepts to ensure clean and efficient code:

- **Encapsulation**: Used in the Product class to keep data members like id and quantity private, accessible only through public methods.
- **Classes & Objects**: The Product class acts as a blueprint for individual stock items.
- **File Handling**: The system uses ifstream and ofstream to load from and save to inventory.txt, ensuring data persists after the program closes.
- **STL (Standard Template Library)**: Utilizes std::vector to dynamically manage the collection of products in memory.

4. System Features

A. Product Registration

The system allows users to input new items, assigning them a unique ID and initial stock level.

B. Stock Persistence

Every time a change is made (adding or selling), the system automatically updates the local text file database.

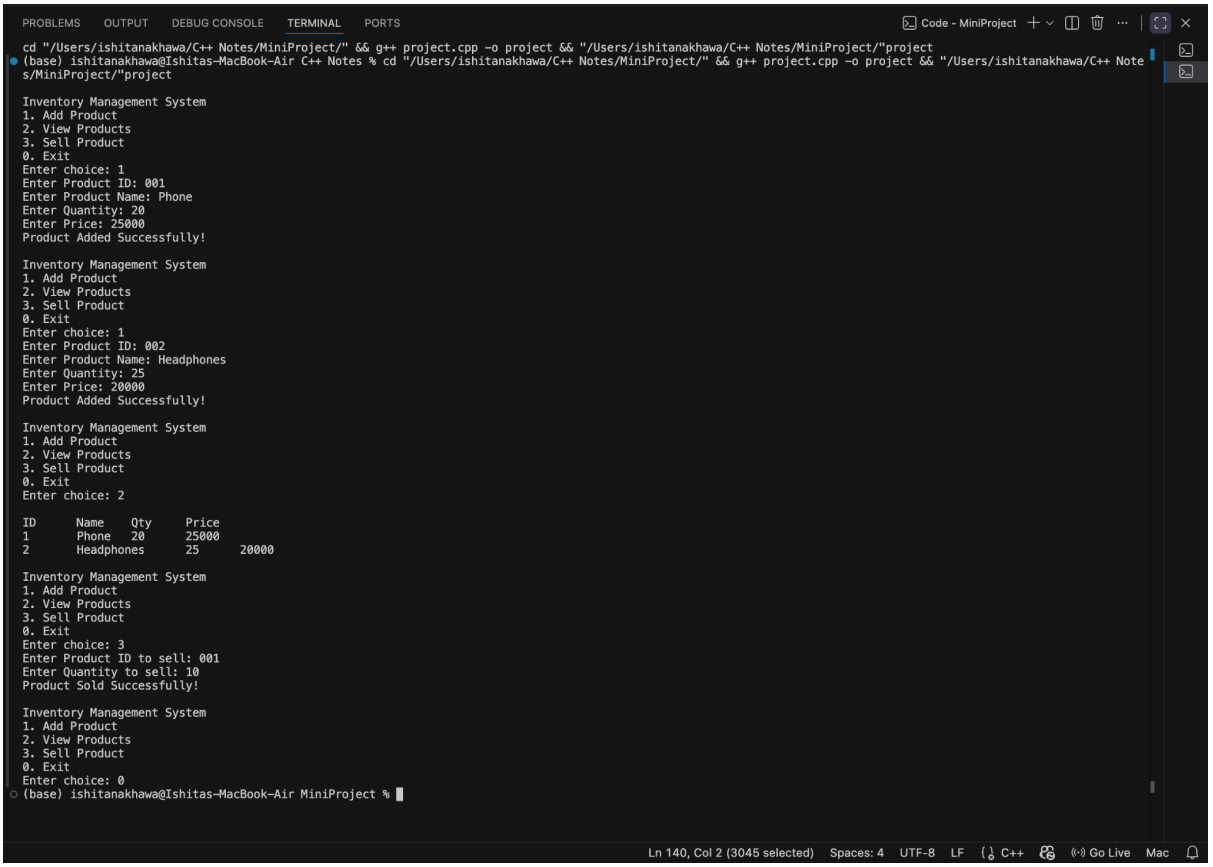
C. Sales Processing

The system checks for current stock levels before authorizing a sale. If the requested quantity exceeds available stock, the transaction is declined to prevent negative inventory.

5. Technical Workflow

Module	Functionality
loadProducts()	Reads existing data from `inventory.txt` and populates the STL vector at startup.
saveProducts()	Overwrites `inventory.txt` with the current vector state to save progress.
sell()	Deducts the specified quantity from the object's internal state.

6. Output



7. Conclusion

This system effectively solves the problem of manual tracking by providing a structured, digital environment for inventory control. By using C++ STL and File Handling, it offers a lightweight yet reliable tool for small-scale stock management.

8. Reference

- https://www.programiz.com/cpp-programming/vectors
- https://www.learncpp.com/cpp-tutorial/member-functions/

9. Github link:

https://github.com/ishitanakhawa/Group5-Mini-Project