**Problem Statement:** Store Inventory Management System

**Background**: A company that deals with a diverse range of products requires an efficient inventory management system to keep track of its product stock, manage restocking, and provide real-time information on product availability. The company operates both physical stores and an online platform, making it essential to have a unified inventory system.

**Proposal:** Design and develop an Inventory Management System that allows the company to effectively manage its product inventory, track product sales, and optimize the restocking process. The system should provide a user-friendly interface for employees to perform the tasks like adding, updating, and removing products (including product details/data), a searching system to quickly find products based on data like name, category, and/or supplier, and an order tracker that automatically updates inventory. A map is the best choice to store and quickly retrieve product information, while a stack or a queue can be used to handle customer orders. For sorting purposes, considering an inventory management system would usually handle large datasets, the merge sort algorithm is the best option available because of its “divide and conquer” functionality, with a time complexity of , making it very efficient for large datasets. This will however hinder performance if the inventory dataset is small.

**Proposed Timeline**

**Sprint 1:** Develop entity models for Product, Order, and Customer (subject to change) with console-based testing.

**Sprint 2:** Write underlying data structures and sorting algorithm with console-based testing. Look into loading and unloading data into files when application is closed.

**Sprint 3:** Start GUI utilizing QT widget tools and implement QTest testing for GUI elements.

Sprint 4: Wrap up testing, and start project write-ups (reports, presentation, etc.)

**Rough GUI Sketch:**

FIGMA tool was utilized to create this sketch, for flow demonstration use this [link](https://www.figma.com/file/4UXYtWdPZ055jSOTTw8sKB/InventoryManagementSystem?type=design&node-id=0%3A1&mode=design&t=cXWTHvVKZGnf2iUs-1).

Screenshots available in the next page.

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