

DSA FINAL PROJECT
"Sari-sari Store Inventory System"

Course Code: 201L DSA	Program: BSCpE
Course Title: Data Structure Analysis	Date Performed: November 8, 2025
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1. Objectives

This activity is composed of group ideas and suggestions. Here are the following objectives:

- To implement a reliable database system storing and managing users, inventory, and sales records securely and efficiently.
- To make a simple user-interface design
- To add a simple log-in feature
- To implement different data types such as linked- list to our system

2. Discussion

The development of the *Sari-sari Store Inventory System* began with careful planning and system design. The team first brainstormed ideas, outlined the flow of the program, and decided to use **Python** as the main programming language due to its versatility and user-friendly nature. The initial phase focused on building the **login and signup system**, allowing new users to register and existing users to securely log in. Once authenticated, users were directed to a prototype cashier dashboard labeled "*Joan's Store*." This served as

the foundation for future system features and provided a clear structure for the user interface.

As development progressed, the team integrated a **linked list structure** to improve data handling for cart items and sales history, setting the groundwork for efficient transaction tracking. New features were also added to enhance functionality and usability, including a **search bar** implemented through the `search_item()` and `update_item()` functions, which filtered items dynamically using SQL-like queries. Additionally, a **real-time date and time display** and a **quantity input field** were added to support transaction tracking and future automation features. The database, managed using **MySQL**, was initialized with `init_db()` to ensure that all product details, prices, and stock information were properly stored and retrieved through the system.

In the latest stage of development, the system was optimized for better performance and user convenience. Several **functional buttons** were introduced, allowing users to add items, generate and view receipts, monitor sales, check stock levels, and log in or out securely. All these features operated smoothly under the main **App class**, which maintained the connection between the interface and database through the continuous loop `app.mainloop()`. The project underwent rigorous testing to ensure data accuracy, responsiveness, and overall reliability. Ultimately, the team created a functional, easy-to-use inventory and sales management system that streamlined store operations and strengthened their technical and problem-solving skills.

3. Materials and Equipment

Computer: used to make the source code for the Skill-Test Visual

Studio Code: used for running the program

Github: used to collaborate and manipulate the program
Mouse: used to navigate the Computer

Keyboard: Used to type the source code

4. Output

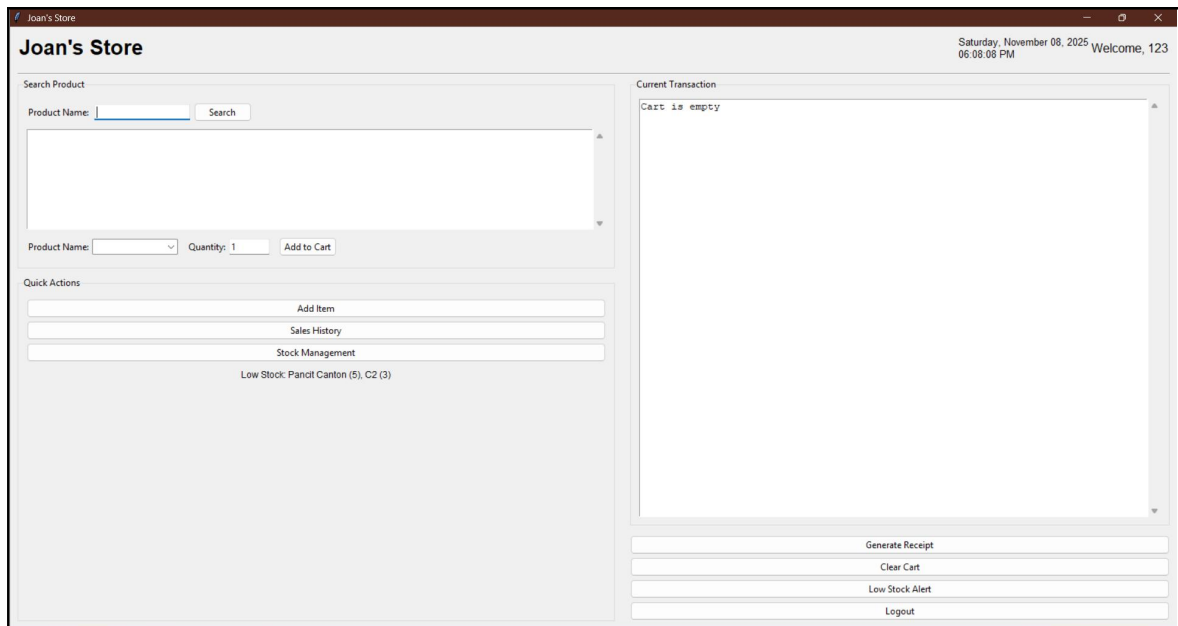


Figure 1: Output

5. Pseudocode

BEGIN

INITIALIZE system

CREATE linked list for products, sales, and cart

LOAD sample products into product linked list

DISPLAY main interface:

SHOW title "Joan's Store"

SHOW date and time

SHOW sections: Search, Cart, Quick Actions

LOOP while application is running:

IF user searches for product THEN

SEARCH linked list for product

DISPLAY results

IF user adds product to cart THEN

CHECK stock quantity

IF available THEN

ADD product node to cart linked list

ELSE

SHOW "Not enough stock" message

IF user generates receipt THEN

CALCULATE total

DEDUCT stock from products

ADD sale record to sales linked list

DISPLAY receipt window

<p>CLEAR cart</p> <p>IF user clicks "Add Item" THEN INPUT product name, price, quantity ADD new node to product linked list</p> <p>IF user clicks "Restock" THEN FIND product node ADD quantity to existing stock</p> <p>IF user clicks "Sales History" THEN DISPLAY all records from sales linked list</p> <p>IF user clicks "Low Stock Alert" THEN DISPLAY products with quantity ≤ 10</p> <p>IF user clicks "Logout" THEN EXIT loop and close program</p> <p>END LOOP END</p>
<p>6. Algorithm</p> <p>Start Initialize the program. Set Application_Running = TRUE.</p> <p>While Application_Running = TRUE</p> <p>a. If user clicks "Logout", then → Exit loop and close program.</p> <p>b. Else, continue running the program.</p> <p>c. If user searches for a product, then → Search linked list for the product. → Display search results.</p> <p>d.If user adds a product to cart, then → Check stock quantity. → If stock is sufficient, → Add product to cart. → Else, show “Not enough stock” message.</p> <p>e. If user generates a receipt, then → Calculate total amount.</p>

f. If user clicks "Add Item", then
→ Input product details.
→ Add new product node to linked list.

g. If user clicks "Restock", then
→ Find product node.
→ Add quantity to stock.

h. If user clicks "Sales History", then
→ Display sales records. i. If user clicks "Low Stock Alert", then
→ Display products with low stock.

End While
Stop program

7. Source Code

<https://colab.research.google.com/drive/1gqW8H69yiyTPxgnfESQvWiklt7AFGKjH?usp=sharing>

8. Flowchart

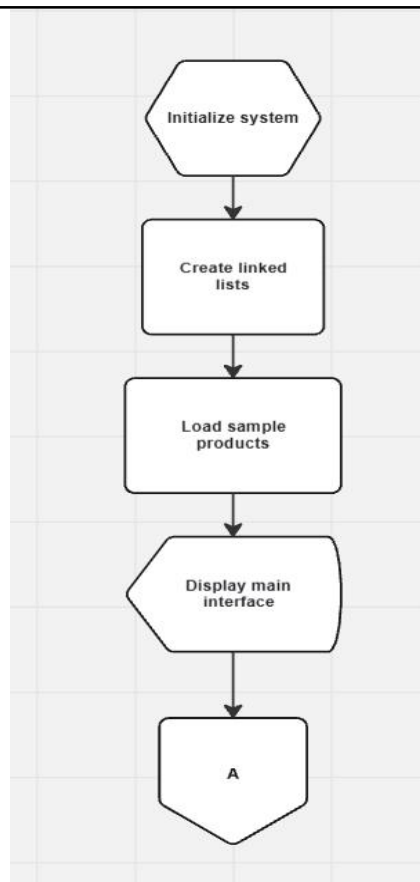


Figure 2.1: Flowchart

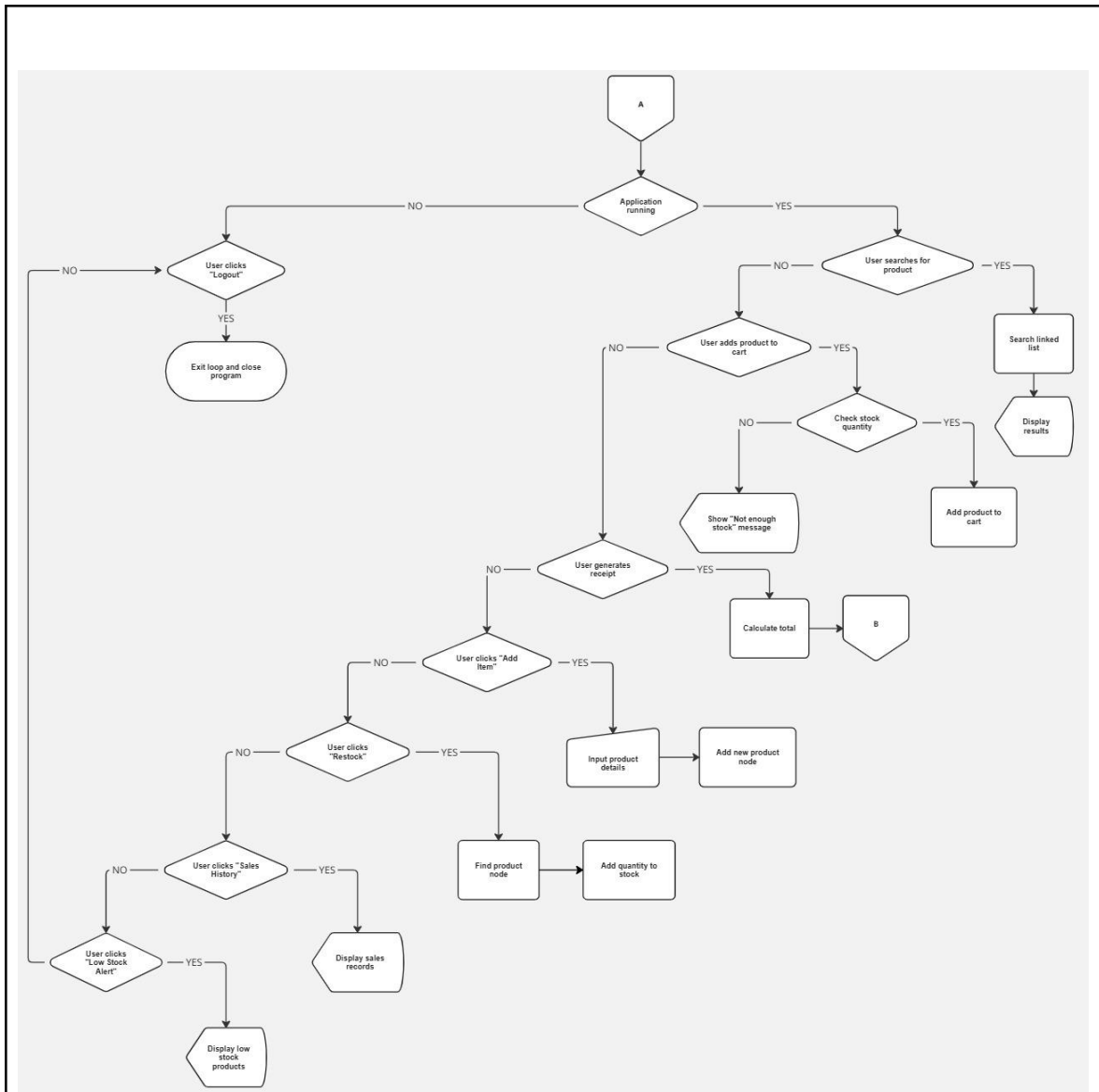


Figure 2.2: Flowchart



Figure 2.3: Flowchart

9. Conclusion

Throughout the development of our *Sari-sari Store Inventory System*, our group made significant progress in transforming a simple idea into a functional, user-friendly cashier and inventory management application. Starting from the initial design of a basic interface with a login and signup feature, we gradually expanded the system to include key functionalities such as real-time

date display, product search, and essential cashier tools like “Add Item,” “Generate Receipt,” “Sales History,” “Add Stock,” “Edit Price,” and “Low Stock Alerts.” These improvements have streamlined daily store operations, enhanced inventory tracking, and made the system more efficient and responsive to user needs.

Our revisions to the original project from our Database Management System course allowed us to strengthen both the front-end design and the back-end logic. By incorporating Python and linked list data structures, we improved the efficiency of product management and data handling. The updated user interface not only provides smoother navigation but also presents information in a clearer and more accessible way for cashiers and store administrators. Future updates, including the planned *Storage Room Module*, aim to centralize product flow monitoring and further enhance stock management accuracy.

Overall, this project has been a valuable hands-on experience that strengthened our technical and collaborative skills as computer engineering students. It allowed us to apply classroom knowledge in programming, database management, and user interface design to a real-world problem. Through teamwork and innovation, we created a system that simplifies retail operations and improves user experience, laying the foundation for a scalable and professional-grade point-of-sale solution that can continue to grow and adapt to future needs.

9. References

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