FINAL PROJECT	
Progress Report 2	
Course Code: CPE201L	Program: Computer Engineering
Course Title: Data Structure and Algorithm	Date Performed: 9/13/2025
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1. Objectives:

The key objectives of this project are:

- To implement a system using Linked list and Stack
- To develop a system that records and tracks inventory items
- To record and manage daily transactions

2. Intended Learning Outcomes (ILOs):

By the end of this project, participants will:

- Apply data structure concepts
- Design and implement a functional inventory management system

3. Discussion:

This canteen inventory system is designed to efficiently manage stocks, products, and transaction history. The goal is to provide a solution that tracks available products, monitors stock levels, and records transaction histories for easy reference. The system will allow users to add new products, update stock quantities, and remove discontinued items, while maintaining a log of past transactions for future review or adjustments.

To handle these tasks efficiently, we will use a **stack** and a **linked list**. The **stack** will store the transaction history using the **Last-In-First-Out (LIFO)** principle. This means that the most recent transaction is always easily accessible, making it ideal for reviewing or correcting the latest sales. Whenever a product is sold, the transaction is pushed onto the stack. This structure allows quick access to the most recent transactions, which is helpful for managing returns or refunds.

The **linked list** will be used for managing the inventory of products. Each node in the linked list will store details about a product, including its name, price, unit and stock quantity. The linked list is ideal for this purpose because it allows for easy insertion and removal of products. As products are added or discontinued, the linked list can be updated dynamically without requiring significant restructuring, making it flexible and efficient for handling an ever-changing product catalog.

4. Materials:

Hardware:

- Computer

Software:

- Python Programming Language
- PyCharm
- GitHub

5. Procedure:

In this project, we will enhance the existing canteen inventory system by integrating **stack** and **linked list** structures. First, we will implement the **linked list** to manage the product inventory. Each product will be stored in a node with details such as **product name**, **price**, **unit**, and **stock quantity**. We'll modify existing inventory management functions to support dynamic updates (e.g., adding, updating, or removing products).

Next, we'll add a **stack** to record transaction history. The stack will store transaction details (e.g., product name, quantity, and sale price) using the **Last-In-First-Out (LIFO)** principle. When a sale occurs, we will push the transaction onto the stack, enabling quick access to recent transactions for review, corrections, or refunds.

The integration will be straightforward: **transactions will update the stack**, while **product information will be managed via the linked list**. We will update relevant functions to ensure that both data structures work seamlessly with the existing system.

6. Output:

7. Conclusion:

8. References: