Data Structures Programming Problems

Problem 1: Number Management System (Using Array, LinkedList, or Stack)

A local analytics firm wants to manage numeric data entries using different data structures. Each time a new number is added, it should be stored in the chosen structure (Array, LinkedList, or Stack). The analyst should be able to remove, view, and check the current status of the data.

You are tasked to create a **menu-driven Java program** that lets the user choose which data structure to use (Array, LinkedList, or Stack) and then perform various operations on numeric data.

The program should include the following operations:
1. Add a new number to the data structure.
2. Remove the most recently added number.
3. View the most recently added number without removing it.
4. Display all numbers currently stored.
5. Check if the data structure is empty.
6. End the program.

Example interaction:
Select Data Structure:
1. Array
2. LinkedList
3. Stack
Enter choice: 3

--- Number Management Menu ---
1. Add Number
2. Remove Number
3. View Top Number
4. Display All Numbers
5. Check if Empty
6. Exit

Problem 2: Product Inventory System (Using Array, LinkedList, or Stack)

A small online store wants to manage its **product names** using different data structures. Each time a new product arrives, it should be added to the chosen structure. When a product is sold, it should be removed. The store manager also wants to view the most recently added product, see all available products, and check if the inventory is empty.

You are tasked to create a **menu-driven Java program** that allows the manager to choose a data structure (Array, LinkedList, or Stack) to manage product names.

The program should include the following operations:
1. Add a new product name to the inventory.
2. Remove the most recently added product.
3. View the top (most recent) product without removing it.
4. Display all products in the inventory.

5. Check if the inventory is empty.
6. End the program.

Example interaction:
Select Data Structure:
1. Array
2. LinkedList
3. Stack
Enter choice: 1

--- Product Inventory Menu ---
1. Add Product
2. Remove Product
3. View Top Product
4. Display All Products
5. Check if Empty
6. Exit