CL2001 – Data Structure Lab

Lab Task # 06

Note:

- Copied task will be awarded **zero** marks.
- Use comments wherever applicable.
- Submit a pdf file containing all your C++ code with all possible screenshots of every task output on Google Classroom. The name of file should be your roll no followed by your name (roll-no-name.pdf) i.e., (24P-1234-Ali.pdf).
- Variables and functions names should be meaningful.

Problem: 1

You are tasked with creating a robust inventory management system for a retail store using a doubly linked list. Develop a menu-driven C++ program to facilitate the following operations:

1. **Add Product**: Allow the user to input details for a new product, including its unique ID, name, price, and quantity. Ensure that products are inserted into the inventory in ascending order of their IDs.
2. **Remove Product**: Enable the user to delete a product from the inventory by providing its ID. Ensure that the list remains sorted after removal.
3. **Display Products**: Display all products in the inventory sorted by their IDs. Include their IDs, names, prices, and quantities.
4. **Update Price**: Allow the user to update the price of a product by entering its ID and the new price.
5. **Find Product**: Implement a feature to search for a product by its ID. Display the product's name, price, and quantity if found; otherwise, notify the user that the product does not exist.

Ensure that the program handles edge cases effectively, such as attempting to remove or update a non-existent product record. Utilize clear user prompts and error messages to enhance usability.

Problem: 2

You are required to implement a program that stores a user-entered word into a doubly linked list, where each character of the word is stored in a separate node. After storing the word, your program should convert the original word into a cipher text using a simple Caesar Cipher technique (shift each character by k positions forward in the alphabet). Finally, the program should also be able to decode the cipher text back into the original word.

E.g:

Original Word: H → E → L → L → O

Apply Ceasar Cipher with a shift of 3:

H → K , E → H , L → O , L → O , O → R

Cipher Text:

KHOOR