Game Development in C++

Scenario

You are tasked with developing a simple text-based game in C++ that incorporates key programming concepts such as Object-Oriented Programming (OOP), Linked Lists, Dynamic Arrays, Queues, Stacks, Data Encapsulation, and Pointers. The game should be interactive, allowing the player to make choices that affect the outcome of the game.

Game Concept

The game is called **"Dungeon Escape"**. The player is trapped in a dungeon and must navigate through a series of rooms to find the exit. Each room contains challenges, treasures, or enemies that the player must overcome or collect to progress. The player has a limited number of moves to escape the dungeon.

Requirements

Your game must include the following:

1. **Object-Oriented Design:**
   - Create classes for the Player, Room, Enemy, Treasure, and Dungeon.
   - Implement data encapsulation by making member variables private and providing public methods to access or modify them.
2. **Linked List:**
   - Use a linked list to manage the sequence of rooms in the dungeon.
   - Each node in the linked list should represent a room and contain information about the room's contents (e.g., enemy, treasure, or challenge).
3. **Dynamic Arrays:**
   - Use dynamic arrays to store the player's inventory (e.g., collected treasures or weapons).
   - The size of the inventory should grow dynamically as the player collects more items.
4. **Queue:**
   - Implement a queue to manage the order in which the player encounters enemies or challenges.
   - The player must face enemies or challenges in the order they are encountered.
5. **Stack:**
   - Use a stack to keep track of the player's path through the dungeon.
   - The player should be able to backtrack to previous rooms using the stack.
6. **Pointers:**

- Use pointers to manage dynamic memory allocation for the linked list, dynamic arrays, and other data structures.
- Ensure proper memory management by deallocating memory when it is no longer needed.

7. **Gameplay:**
   - The game should be interactive, with the player making choices (e.g., fight an enemy, collect treasure, or move to the next room).
   - The game should end when the player either escapes the dungeon or runs out of moves.

Deliverables

- A complete C++ program that implements the game as described.
- A report (2-3 pages) explaining your design choices, how you implemented the required data structures, and any challenges you faced.
- A brief user manual explaining how to play the game.

Due Date

The assignment is due on **March 2^{nd}, 2025**. Late submissions will incur a penalty of 10% per day.

1 References

You can find python version of similar game at link: `https://github.com/annacakes281/escape-the-dungeon`