**Data Structure**

**Name : Zirwah Khalil, Fatima Section : D**

**Roll No. 22i-0748, 22i-1074**

**Project Report : "Enchanted Labyrinth Explorer"**

**Introduction:**

The Enchanted Labyrinth Maze Game is an immersive gaming experience developed by Fatima and Zirwah. This project aimed to create an engaging maze game set in a magical realm, offering players an adventurous journey through intricate labyrinths filled with challenges and mysteries

**Work Distribution:**

The development of the Enchanted Labyrinth Maze Game was a collaborative effort between both of us, each contributing their skills and expertise to different aspects of the project.

| **Work** | **Member** |
| --- | --- |
| AVL Tree Implementation | Zirwah |
| Maze Generation | Zirwah, Fatima |
| Shortest Path Finding | Fatima |
| Combat Mechanics and Enemy Encounters | Fatima |
| Reward System Enhancement | Zirwah |
| User Interface Design | Fatima |
| Sound | Zirwah, Fatima |
| Random Generation of maze | Zirwah |
| File Handling | Fatima |

**Brief Explanation of Code :**

1. Menu Navigation:
   * The code includes a menu for navigation, which provides options such as starting a new game, exiting the game, accessing help, and viewing the highest scores.
2. New Game with Random Maze Generation:
   * Each time a new game is started, a random maze is generated for the player to navigate through. This ensures that every game experience is unique and offers fresh challenges.
3. Inventory System:
   * The game features an inventory system where the player can collect items found throughout the maze. These collected items are stored in the player class using an AVL (Adelson-Velsky and Landis) tree data structure.
   * Each item in the inventory has unique values associated with it, allowing the player to keep track of what they've collected and potentially use these items to overcome obstacles or challenges in the game.
4. Enemy AI:
   * The game includes three enemies that chase the player throughout the maze. These enemies utilize a pathfinding algorithm, such as Dijkstra's algorithm, to find the shortest distance to the player's current location.
   * The enemies' behavior adds an element of danger and urgency to the game, as the player must navigate the maze while avoiding being caught by the pursuing enemies.
5. Help Functionality:
   * When the player presses the "H" key, the game provides assistance by highlighting the shortest path to reach a specific destination, typically the exit or an important objective.
   * This functionality helps players who may be stuck or unsure of where to go next, offering guidance to progress through the maze and continue their adventure.

Overall, the code implements a dynamic and immersive gaming experience, featuring random maze generation, inventory management, challenging enemy AI, and helpful assistance to aid players on their journey through the enchanted labyrinth.