Code Report: HOMEWORK3

1. Introduction

This code contains a C program that simulates a game. The objective of the game is for a player to navigate through a map, collect specific targets, and reach the final destination.

2. Code Structure

The code is written in the C programming language and consists of the following sections:

1. **Libraries and Definitions**: Standard libraries like **stdio.h**, **stdlib.h**, and **time.h** are included. Then, constants and global variables are defined.
2. **Main Functions**: Main functions such as **initialize_game()**, **printBoard()**, **movePlayer()**, and **main()** control different aspects and flow of the game.
3. **Game Board and Characters**: Arrays and functions necessary for defining the game board and characters are present. Additionally, the ECTS points collected by the player are tracked.

3. Functions

- **initialize_game()**: Prepares the initial state of the game. It randomly selects the target positions, the player's starting position in the fields, and constructs the map.
- **printBoard()**: Prints the game board on the screen. It displays the player's position, walls, targets, and collected ECTS points on the board.
- **movePlayer()**: Controls the player's movement. It updates the player's position based on the move entered by the player and checks the conditions related to that move.
- **main()**: Starts the main loop of the game. It prompts the user to make moves and checks whether the game is over or not.

4. Game Flow

- The game begins with the **initialize_game()** function. The game board is created, and the player's starting position is determined.
- The game continues with an infinite loop in the **main()** function. In each iteration, the player is asked to make a move, and this move is processed using the **movePlayer()** function.
- The player increases their ECTS points by reaching targets and avoiding walls. Additionally, the player's movements are limited, and any move that collides with walls or boundaries is considered invalid.
- The game ends when the player reaches the final destination (symbolized by the 'X' character) or performs the exit move. The results, including the total ECTS points and the number of moves made, are displayed at the end of the game.

5. Conclusion

This C program simulates the basic mechanics of a game. It includes fundamental game features such as player movement, ability to overcome obstacles on the map, and action of collecting targets. At the end of the game, statistics such as the total ECTS points and the number of moves made are presented.

below are some output photos:

```
. . . . . . . . . . . . . . . .          Enter your move: a
. . . . . . . . . . . . . . . .
. . . . . . . . . . . . . . . .          you have not collected enough ECTS
. . . . . . . . . . . . . . . .          . . . . . . . . . . . . . . . .
. . . . # # # # # # # # . . .             . . . . . . . . . . . . . . . .
. . . . # 2 2 2 . . . # . . .             . . . . . . . . . . . . . . . .
. . . . # . # # # # 2 # . . .             . . . . . . . . . . . . . . . .
. . . . # . # . 1 1 # 2 # . . .           . . . . # # # # # # # # . . .
. . . . # 2 # 1 P . # . # . . .           . . . . # 2 2 2 . . . # . . .
. . . . # . # 1 . . # 2 # . . .           . . . . # P # # # # 2 # . . .
. . . . # 2 # # # # # 2 # . . .           . . . . # . # . . . # 2 # . . .
. . . . # . 2 2 2 . 2 . # . . .           . . . . # . # . . . # . # . . .
. . . . # # # # # # # # # . . .           . . . . # . # . . . # 2 # . . .
. . . . . . . . . . . . . . . .           . . . . # 2 # # # # # 2 # . . .
. . . . . . . . . . . . . . . .           . . . . # . 2 2 2 . 2 . # . . .
. . . . . . . . . . . . . . . X           . . . . # # # # # # # # . . .
Total ETCS = 0                            . . . . . . . . . . . . . . . .
                                          . . . . . . . . . . . . . . . .
Enter your move:                          . . . . . . . . . . . . . . . X
                                          Total ETCS = 48

                                          Enter your move:
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```
Enter your move:
s
. . . . . . . . . . . . . . . . .
. . . . . . . . . . . . . . . . .
. . . . . . . . . . . . . . . . .
. . . . . . . . . . . . . . . . .
. . . . # # # # # # # # # . . .
. . . . # . . . 2 . . . # . . .
. . . . # . # # # # # 2 # . . .
. . . . # . # . . . # 2 # . . .
. . . . # . # . . . # . # . . .
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. . . . # # # # # # # # # . . .
. . . . . . . . . . . . . . . . .
. . . . . . . . . . . . . . . . .
. . . . . . . . . . . . . . . . . P
Congratulations! You've completed the game.
Total ECTS: 96
Total Moves: 45
Program ended with exit code: 0
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