CPS2002 Assignment – Part 2

Deadline: 17th April 2017

1. Overview

Your client wants to create a multiplayer game in which 2 or more players compete to find a treasure on a map. Each player will start at a random point on the map and will only by familiar with the parts of the map which (s)he visits.

The goal of the game is to explore the map and try to find the treasure before any other player.

2. Rules of the game

The game is played by on randomly generated maps consisting of n x n tiles where n is a parameter, which can be set by the user who starts the game. The minimum value which n can take is **5**. A map will consist of 3 types of tiles:

1. A *grass* tile, depicted by a green tile. This tile is safe for the user to move to.
2. A *water* tile, depicted by a green tile. This tile is dangerous and if a user steps onto it, (s)he dies and restarts the game from the original starting position.
3. A *treasure* tile, depicted by a yellow tile. Once a player reaches this tile, (s)he wins the game.

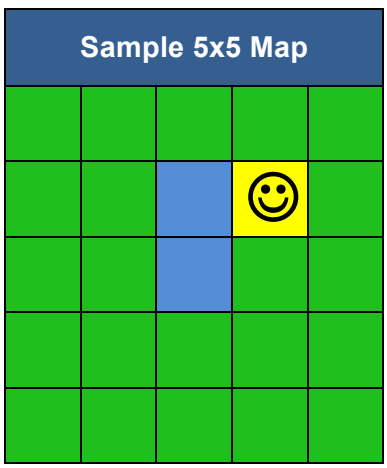


Figure 1: A sample 5x5 map

Each player starts at a randomly generated position, which is assured to be a grass tile. All other tiles are initially greyed out. Players can then independently start exploring the map by moving in one direction at a time: left, right, up or down. When the user moves to a tile, the type of the tile is revealed on that player's map.

The following is an example of a game in progress with each player having made 2 moves.

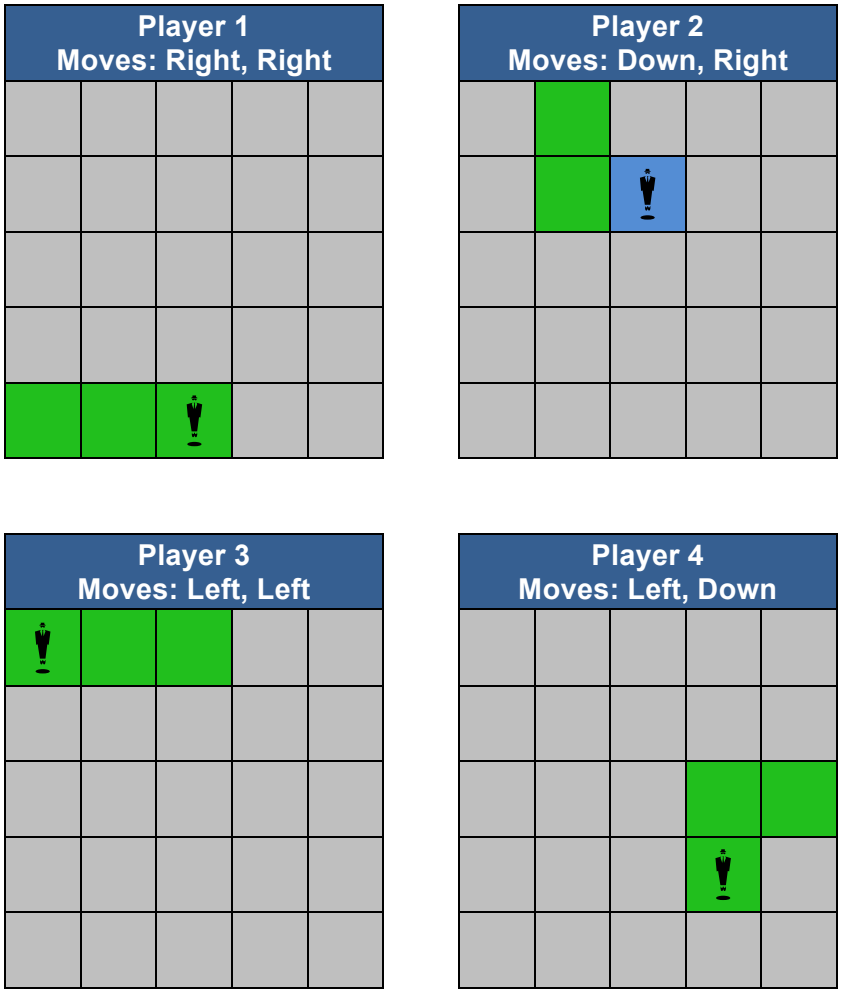


Figure 2: The view from 4 players having played 2 moves each.

If a player hits a water tile, then (s)he dies and starts the game again from his/her starting position.

3. Main Game Loop

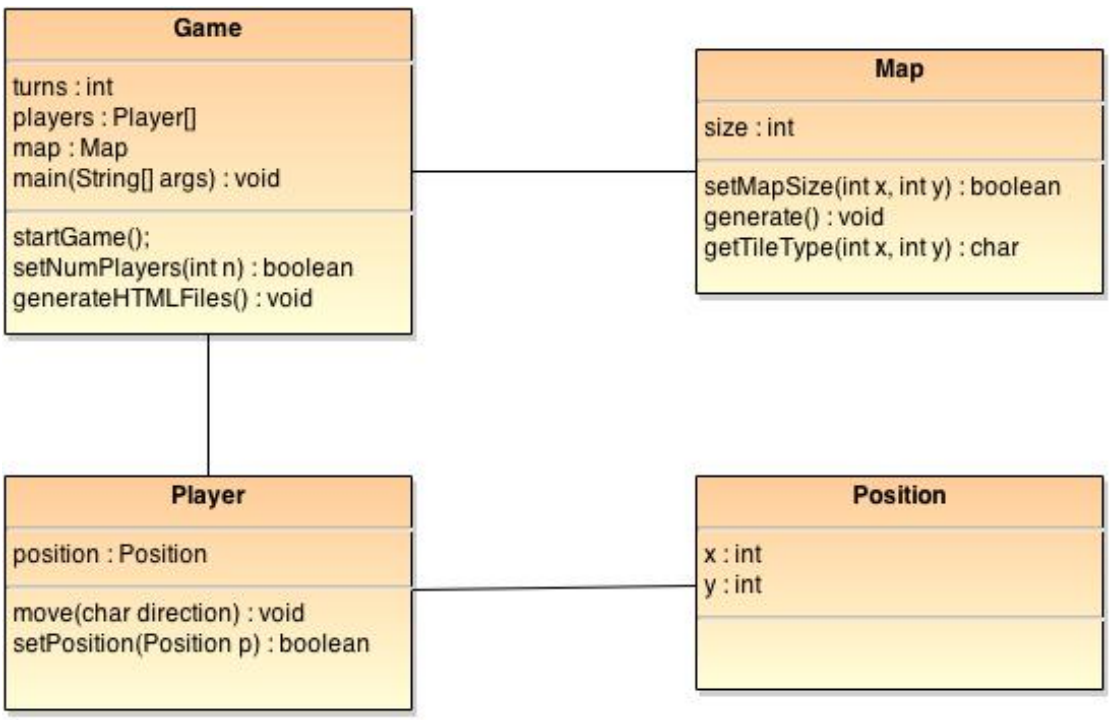
The game will be played from a single text-based console as follows:

1. On startup, ask user many players will be playing and the size of the map.
    a. Min players = 2
    b. Max players = 8
    c. Min map size
        i. 2-4 players = 5 x 5
        ii. 5-8 players = 8 x 8
    d. Max map size = 50 x 50
2. Generate a map of the required size.
3. For each player, generate a random starting position on the map.
    a. Starting position has to be a grass tile.

4. Generate an html file for each user
    a. Name the file map_player_**n**.html (where n is the number of the player).
    b. The file will contain a simple html table that displays the map from the user's perspective. That is, each player sees the tiles he/she has discovered so far, as well as his/her current position.
    c. This enables each player to access his map from a browser.
5. For each player:
    a. Ask for a direction to move: (U)p, (D)own, (L)eft, (R)ight
    b. Ensure that the user does not try to move outside the map
6. Wait for all players to disclose their next moves before moving to the next step.
7. For each player:
    a. Uncover the target tile
    b. If target tile is the treasure, the player wins the game
    c. If target tile is grass, the player's position moves to the new tile
    d. If the target tile is water, the tile is uncovered by the user moves back to his/her starting position
    e. If multiple players find the treasure in the same move, then all players who discovered the treasure are declared winners
8. If no one has found the treasure, go to step 4.

4. Initial Class Design

The following is the high-level class design for the game. Whilst, the class diagram is meant to act as a guide, feel free to add methods/classes as desired.



5. Deliverables

You are to implement this system using a test driven approach, committing to Github on a regular basis with each commit being picked up by your continuous integration job on Jenkins.

When you are done with this part of the assignment, please do the following:

1. Tag your source code on Github so that we can refer to it in its current state in future.
2. Send an e-mail to mark.micallef@um.edu.mt stating that this part of the implementation has been completed and provide the tag name you used.
3. Please take note of your code coverage metrics at this point and take note of (1) which parts of your code are not covered and (2) why they are not covered. This will form part of your final assignment report.

6. Questions and Clarifications

Any questions and clarifications should first be looked up on the Assignment forum in the VLE. If you do not find your answer there, you should post the question on the forum. It will be answered by fellow students or the lecturer. If you feel your problem has not been solved within 2 days of posting it, e-mail the lecturer personally.