CS1527 Object-Oriented Programming 2019-2020

Mini-Project: Maze Game

Introduction: This is a text-based adventure game, and the interface is presented on the terminal with printed characters. At the beginning of the game the player will be asked to choose a difficulty for the game (possible difficulties are: 1 – Easy, 2 – Medium, 3 – Hard, 4 – Very Hard).

```
Type the number for your difficulty level
        1: Easy
        2: Medium
        3: Hard
        4: Very Hard
```

Figure 1: Choosing a difficulty level

After the player successfully chooses a difficulty, a maze of size 17*17 will be randomly generated, and then the initial positions of the hero (letter “H”), five monsters (letter “M”), and five goblins (letter “G”) will all also be generated randomly in the maze. The coordinates of all will be printed on the screen. The maze is composed of wall bricks (symbol “#”) and routes (symbol “-”), and the maze is fully closed by surrounding walls, so it has no entrance or exit. A possible initial game configuration is as shown in *Figure 2*.

```
1
Hero at coordinates (1,1)
Health goblin at coordinates (4,11)
Wealth goblin at coordinates (15,6)
Gamer goblin at coordinates (10,15)
Health goblin at coordinates (9,12)
Gamer goblin at coordinates (1,14)
Fighter monster at coordinates (9,11)
Thief monster at coordinates (2,7)
Gamer monster at coordinates (9,5)
Gamer monster at coordinates (1,6)
Thief monster at coordinates (15,1)
[#, #, #, #, #, #, #, #, #, #, #, #, #, #, #, #, #]
[#, H, -, -, -, -, -, -, -, -, -, #, -, -, M, #]
[#, -, #, #, #, #, #, -, #, #, #, #, #, #, #, -, #]
[#, -, -, -, #, -, -, -, -, -, -, -, #, -, -, -, #]
[#, #, #, #, #, #, #, #, #, -, #, #, #, #, #, -, #]
[#, -, #, -, -, -, -, -, #, M, #, -, #, -, #, -, #]
[#, M, #, #, #, -, #, #, #, -, #, -, #, -, #, G, #]
[#, -, M, -, -, -, #, -, #, -, -, -, #, -, #, -, #]
[#, -, #, -, #, #, #, -, #, -, #, -, #, -, #, -, #]
[#, -, #, -, -, -, -, -, -, -, #, -, #, -, #, -, #]
[#, #, #, -, #, #, #, #, #, #, #, #, #, -, #, -, #]
[#, -, -, -, G, -, #, -, -, M, #, -, #, -, #, -, #]
[#, #, #, -, #, #, #, -, #, G, #, -, #, -, #, -, #]
[#, -, -, -, -, -, #, -, #, -, -, -, -, -, -, -, #]
[#, G, #, #, #, #, #, -, #, #, #, -, #, #, #, -, #]
[#, -, -, -, -, -, -, -, #, -, G, -, #, -, -, -, #]
[#, #, #, #, #, #, #, #, #, #, #, #, #, #, #, #, #]
```

Figure 2: Initial game configuration example

The player starts with 1000 coins and 100 hp (health points) and each move costs him 1 health. You can click “H” to see a manual for all available controls, or just start moving with the arrow keys or WASD.

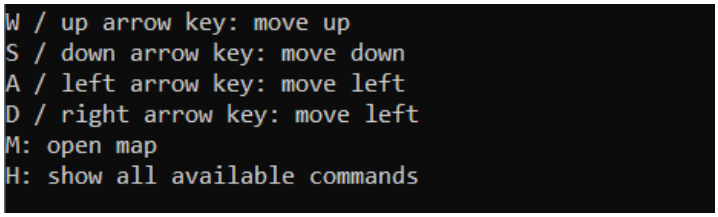


Figure 3: Manual with available commands

When a hero approaches a goblin, or a monster, a message on the screen will be displayed, informing them about what is happening. The goblins are the hero’s friends, they will give him coins or health, depending on his luck. Contrary, the monsters are the hero’s enemies, they will make him lose coins and health.

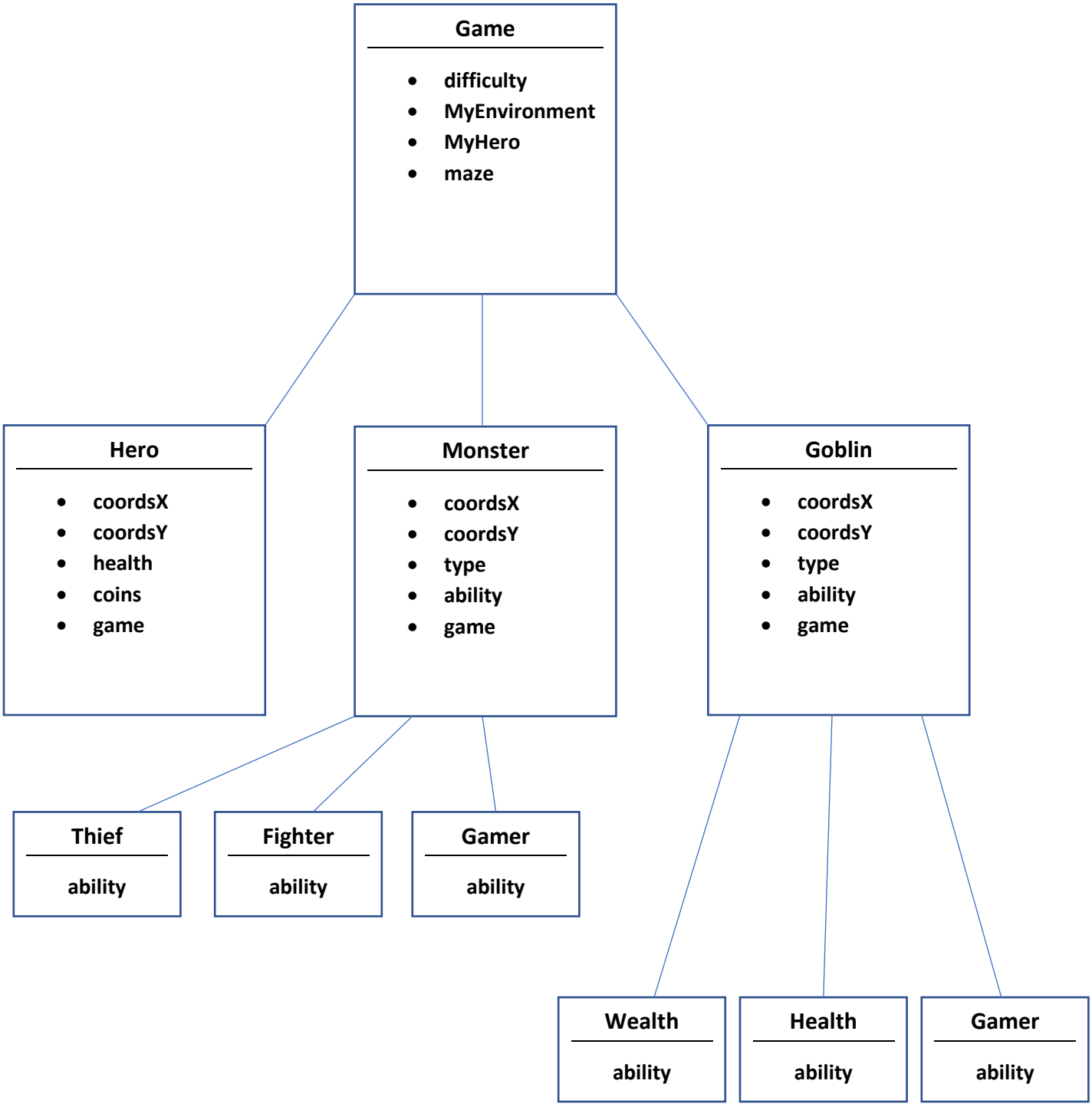
There are three types of goblins:

- **Wealth:** gives a random amount of gold coins to the hero when they meet. One such goblin may have the ability of (100, 50%), which means they will give the hero 100 coins at a probability of 50%.
- **Health:** recovers hero’s health. One such goblin may have the ability of (50, 70%), which means they may give 50 health to the hero at a probability of 70%.
- **Gamer:** plays rock-paper-scissors with you and if you win, you get coins and health. One such goblin may have the ability of (100, 50), which means if the hero wins the game, they will get 100 coins and 50 health points from the goblin.

Similarly, there are also three types of monsters:

- **Thief:** steals coins from you. For instance, one such monster may have the ability of (10, 90%), which means they can steal 10 coins from a hero with a success rate of 90%.
- **Fighter:** fights with you and if you lose the fight, your health points are reduced. For instance, one such monster may have the ability of (30, 40%), which means they will reduce the hero's health score by 30 with a probability of 40%.
- **Gamer:** plays rock-paper-scissors with you and if you lose the game, you lose coins and health. One such monster may have the ability of (100, 50), which means if they win the game, they will get 100 coins from the hero and reduce the hero's health score by 50.

The game is successful if the player visits all 5 monsters without dying. At the end of the game a leader board is displayed on the screen, showing the top 10 players that have played at the same difficulty you chose at the start of the game.


Game
difficulty
MyEnvironment
MyHero
maze
Hero
coordsX
coordsY
health
coins
game
Monster
coordsX
coordsY
type
ability
game
Goblin
coordsX
coordsY
type
ability
game
Thief
ability
Fighter
ability
Gamer
ability
Wealth
ability
Health
ability
Gamer
ability