LP24 Project

April 2018

This time LP24 proposes 2 projects from which you need to choose one to develop. The games are:

1. Snakes and Ladders
2. Hill Climb Racing

The description of each project is provided in the respective section of each game.
NOTE: Choose the one you feel more interested in and the one you think will contribute more to your learning.

1 Snakes and ladders

Snakes and Ladders is an ancient Indian board game that historically was based on morality lessons. The player's progression up the board represented a life journey complicated by virtues (ladders) and vices (snakes). It is played between two or more players on a gameboard having numbered, gridded squares. A number of "ladders" and "snakes" are pictured on the board, each connecting two specific board squares.

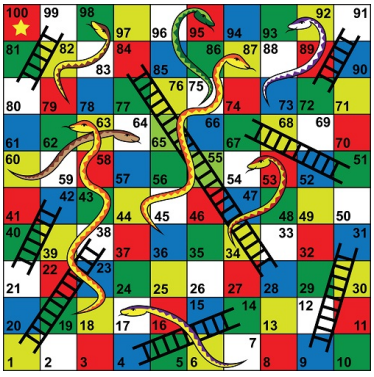

Figure 1: Board example

The objective of the game is to be the first player who reaches the end navigating on the board, following the numbers of each gridded square, helped or hindered by ladders and snakes respectively. You can play the game directly in your browser with the following link:

`http://www.playonlinedicegames.com/snakesandladders`

1.1 Instructions

Each player starts with a token off the board next to the "1" grid square. Throw a dice to move the token by the number of squares indicated by the dice roll.

If your token falls in the head of a snake, you should move back to the grid square where its tail is pointing.

If your token falls in a grid square where a ladder is located, you should move up where the ladder ends. Ladders give only the possibility to up, not down.

If a player rolls a 6, after moving, immediately takes another turn.

In order to win you should throw exactly the number to reach the goal. In case your get a higher number in the dice, your token moves toward the goal and then starts moving back. For example if you are 2 gridded squares away from the goal and your dice rolls a 5, you move 2 squares forward and then 3 back. Now you need a 3 to be the winner.

1.2 Your work

The aim of this project is to implement a snake and ladders board game using JAVA with some slightly improvements. The game follows the traditional rules explained above but we will add two more things to make it more interesting and challenging.

1. **Dynamism.** In the original game the ladders and snakes have fixed positions while in this version the positions will change after certain number of turns (10 for example). You will need to define new pair positions that can be able to move the player up and down. Choosing pair squares in the same row is not possible.

2. **Puzzle challenge.** The player throws the dice and in order to be able to move his/her token, he/she will need to provide the correct answer for the

puzzle. The difficulty of the puzzle is up to you. Create a good amount of questions since you don't want to repeat them if the game last long.

The game needs to have at least the following requirements for your evaluation:

- Board of at least 64 cells with 4 leaders and 4 snakes.
- Change the ladders and snakes every 8 turns, or ask the player at the beginning of the game.
- Multiplayer game. At least 2 players. Use your creativity if you want to personalize your tokens for your game.
- Puzzle of at least the same number of cells in your board (64). Take into account that the puzzles should not be so difficult, otherwise the players will never move.
- Provide a graphical input for the player to answer the puzzle and get the feedback.

1.3 Improvements (optional)

In order to improve the game (and the grade) several proposals may be considered (this list is not exhaustive).

- Different board sizes, number of snakes and ladders.
- Adding new rules to the game. For example if you get a 3 when you throw the dice, everyone should move one step back while you move 3 steps forward.
- Create different puzzle categories and assign a category to each cell in your board.
- A timer. Define how much time you are willing to wait for the player to answer the puzzle. If not answered in time, his/her turn is lost.
- Create a board score and count the number of correct answers. If you use categories assign different scores for each one. Save the score in a text file to display the highest scores.
- Change the finish gridded square. If you want to make the game more unpredictable change the finish point after certain number of turns.
- Change direction.

To be evaluated you must provide a ".jar" file with potential resources and the source code. The game must be started with a terminal (a script may be provided to launch the game but it is not mandatory).

2 Hill Climb Racing

Hill Climb Racing is a 2D video game by Fingersoft. It was released on Google Play and for devices using Apple's iOS in 2012.

Figure 2: Hill Climb Racing

The object of the game is to collect coins while driving through racing stages. Driving consumes gas or battery for electric powered vehicles (even if you're not moving), which players can replenish by picking up gas canisters or batteries along the way. The player can "die" in various ways, such as if they run out of gas or hit the avatar's head on the ground or ceiling (in levels such as Cave). Coins may also be earned by performing "tricks", difficult maneuvers in the air, or by reaching set distances during given stages. Coins may be spent on upgrades, or to unlock new stages and vehicles. Different stages have different attributes, such as different gravity, traction, terrain (elevation) or obstacles that will slow the player down.

2.1 Your work

The aim of this project is to program a game like Hill Climb Racing in JAVA with some modifications.

1. The goal will be to reach a finish point in the stage without running out of fuel.
2. Player will need to pick up coins to buy fuel instead of upgrading car or unlocking stages.
3. Player will die if fuel finishes or car goes upside-down.

The game needs to have at least the following requirements for your evaluation:

- Design at least 2 stages for driving.
- Locate coins in hard places to reach (at least 1 in each stage).
- Smart design. You need to considers the min fuel need it to reach the goal and place the necessary coins in the stage.

2.2 Improvements (optional)

In order to improve the game (and the grade) several proposals may be considered (this list is not exhaustive).

- Let the player chose the vehicle.
- Several stages increasing difficulty with different attributes (challenging elevations to climb, obstacles, coins hard to reach and necessary for buying fuel).
- Set a number of maximum lives for the player.
- A timer. When the timer reaches 0 the stage ends.
- The possibility to record the player's name and time elapsed for each stage and rank the best times for each one.

To be evaluated you must provide a ".jar" file with potential resources and the source code. The game must be started with a terminal (a script may be provided to launch the game but it is not mandatory).