SNAKES & LADDERS MEMORY MASHUP

COMPX241 – Group Report

Abstract

The group project for the snakes & ladders memory mashup game

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Executive Summary

The Snakes & Ladders memory Mashup game is a project that is designed to modify and match up 2 games into one. In our case, we matched up Snakes & Ladders to the memory card game. This project is aimed to increase our knowledge in software engineering by working on a task in a team and group of people and work out how to tackle the project. The Snakes & Ladders memory mashup game is playable on the browser and no download is needed. The aim of the game is to flip 2 tiles and to match them to move up the board by that number. This also has a probability of creating either a snake or a ladder. The first person gets to 100 wins.

The 2 group members working on this project are Youssef Elwakil & Anders Bjerring. 2 second year Software Engineering students working on the project. Anders Bjerring focused on the Game mechanics of the project whilst Youssef Elwakil focused on the Graphics side of the project. The work was split evenly, and the project was completed in time.

GitHub link: https://github.com/31-33/snakes-and-ladders

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Introduction

The goal of this project was to develop a fun, interactive 2D game that relied less on pure luck and more on the skill and careful planning of the individuals playing.

While doing so the team will need to learn new skills that will prove useful in future software development work. Such as how to program in a team using version control and distribution applications, organization and time management using team accessible check/project goal lists, and a wider array of programming languages and libraries.

The approach taken by the team to achieve this was to have the playing board start off as a blank slate that would be built upon dynamically as the game continued and to replace the luck centric dice roll with a more skill-based method of player movement.

The plan for achieving this goal was to have the tiles of the board act as the memory matching game, where on their turn a player would click on any two of the tiles on the board to flip them revealing a number on the underside of the tile. If the numbers matched up the player would move the same number of tiles as the value of the matched number. Also, upon achieving a match there would be a preset chance for either a snake or a ladder to be drawn between the two matched tiles, building the board as the game is played.

The value of this project is to learn to work in a group on a project. The snakes & ladders project was valuable as it allowed to work on the game development side of coding and software engineering. This gave us more of a motivation and incentive to work on as both members of the project are very into gaming and interested in game development. This, therefore, made us want to do more work on this project and work harder on it.

Our project was based off a react game already made called snakes and ladders. However, this doesn't fill our goal by making the game less on pure luck. So, we decided to go with the approach to modify the luck using our tiles. The react game linked to us however, had similar game functions but wasn't as fun. The linked game also has a different way of implemented tiles and therefore is different and unique. Here are the 2 different games:

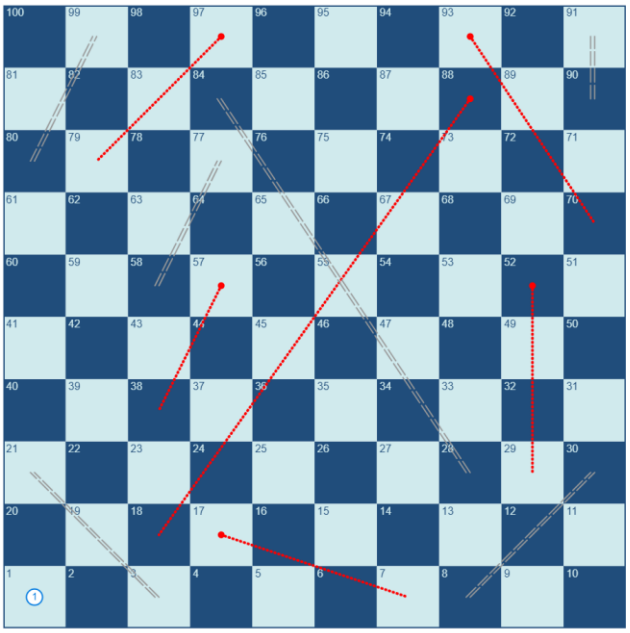

Figure 2 Linked react game design

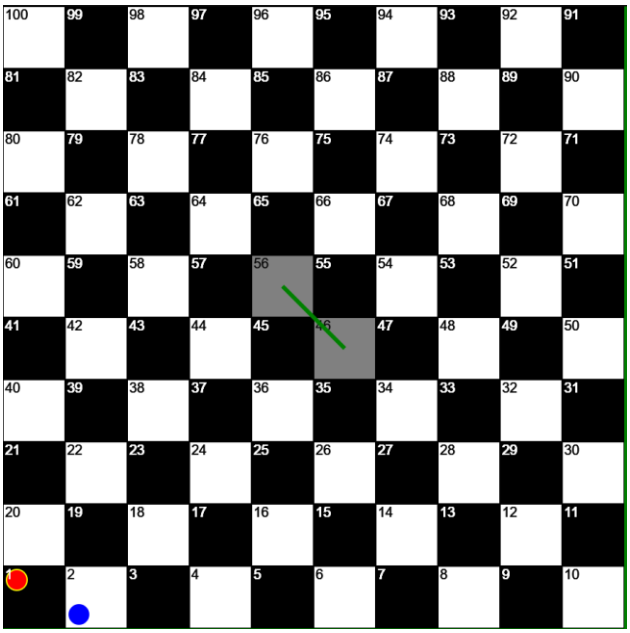

Figure 1 Final Project Design

Background

The lessons & skills learned throughout this project were plentiful. Both members worked on individual parts of the project and so each person learned different things. The main skills learned was as follows:

GitHub

Both project members learned how to manage the code and upload and commit using GitHub. This benefited us a lot as we were both working on our project the same time and we wanted to use each other's work at the same time. GitHub allowed us to do this by making us upload our code and update it for the other user by committing and pushing. This saved a lot of time and made our life much easier. Prior to this we were using simple emailing which was inefficient.

JavaScript & React

The main coding language used in the project was JavaScript. However, to implement our graphics, we used the React dependency to make the user interface cleaner and easier to code. Both team members utilised React to their advantage. Anders used React to draw the snakes and ladders on the board, whilst used utilised React to draw the players, tiles and the board. JavaScript and React were easy to learn and took a short period of time before we managed to start implementing it to our project.

Node.js

Node.js was used by both Youssef & Anders to test the code and launch it on a server. This server is hosted using Node.js with the localhost. This allowed us to run the code on a "private" server to view how the program looks like and be able to modify it in real time whilst looking at what the outcome is. This was very inefficient for us to use as it allowed us to view changes instantly and fix bugs whenever we came across it.

Project Management

Project management was the key to success in this project. During the fourth week of the project, one of the members left and did not contribute to any part of the project. This then made the project members worries and therefore made them have more pressure on the project. Since this incident occurred, more time must have been put into both members of the group. Whilst this put pressure on both of us, this allowed us to learn how to deal from drop out members and deal with faults in teams. We started making time schedules and met up more in person to code and work on the project together. In the end, the project turned out to be completed on the deadline day due to the project management skill.

Implementation

Overall the presented version of the project worked as intended, except for small bonus quality of life features such as manually selecting the number of players or professionally voice acted sound effects not making the cut before the deadline. The current rendition of the project meets all the goals that the team had planned for it to achieve. This meant, that the project had the ability for 2 players to lay with each other. It allowed the player to move up the number of spaces that was matched. It allowed the creation of a snake and a ladder and allowed the game to be less luck and more skill. The game functions smoothly and has no bugs that the development team are currently aware of aside from the potential to match a ladder on the final tile and jump straight to the end of the game which is more of a flaw in the current game logic than a bug. To succeed in playing the game more attention and strategic thinking is required than a standard game of snakes and ladders, leading to a more engaging experience.

Start of the game

Once the game is loaded onto the web page, the game is started and player 1 has the ability to select 2 tiles to match. Once they match player 1 goes up by that number behind the tiles that he matched. The tiles then have a 20% chance to create either a snake or another 20% chance to create a ladder. After moving by that space, the player's turn is over and player 2's turn begins.

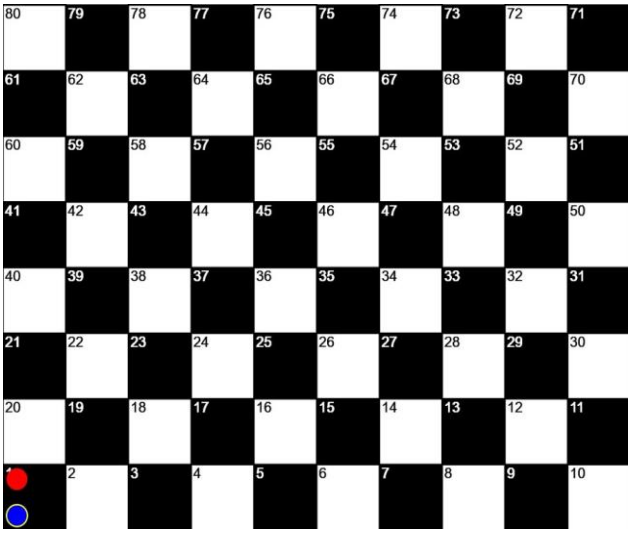

Figure 3 New Game – Final Design

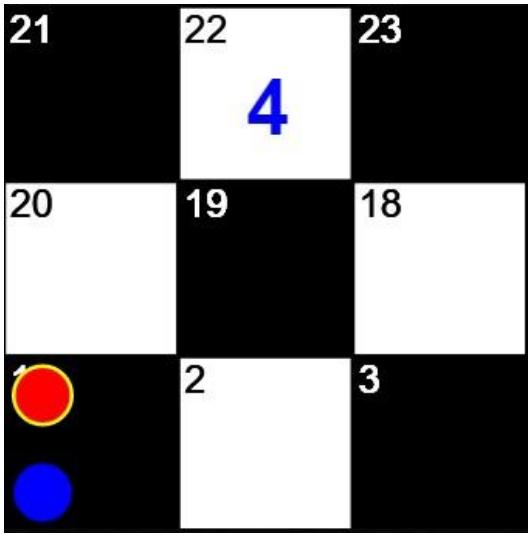

Figure 4 Revealed Tile

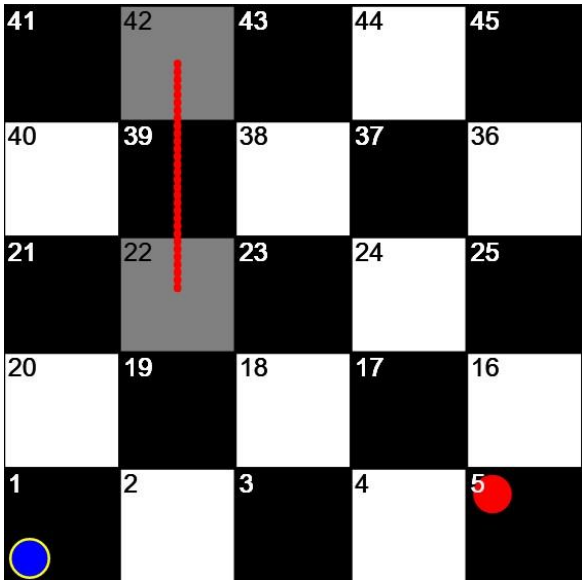

Figure 5 Red successfully made a match and a snake was drawn between the pair

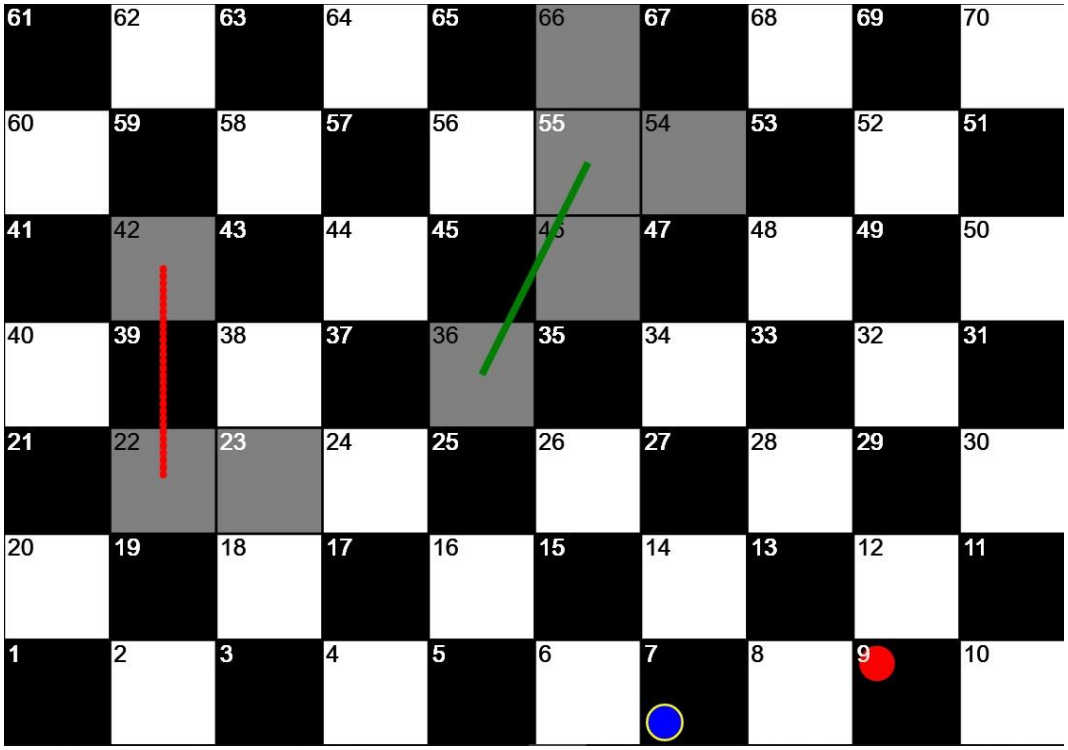

Figure 6 Several turns in, both a snake and a ladder now on the board

For future development, we would like to improve the game by allowing online multiplayer so that it allows people with not many friends or siblings to meet new people around the world and connect and play with them. We also would like to implement a leader board system so that users and players can try beat their high score or record time and have more of an incentive to play the game more.

Conclusion

Project Mashup provided a fun and interesting assignment that helped the team to learn a variety of skills that will likely prove useful in a future workplace environment. The main things learnt from this project was how to deal with unexpected risks that occurred, JavaScript, React, Nodejs and GitHub. It is a good experience to learn all these skills by working on a project as most of the real-world jobs are based on projects and these skills are fundamental to any software engineer. Another lesson learned was how to present the project. Our presentation went well, and we managed to deliver a good presentation to display how the project works and why we chose and did this. Time management was also another big part into this project as it was required for us to allocate a lot of time into research and development for the Snakes & Ladders game.

Recommendations from the team for programmers planning future work in this area; Plan out your project, figure out what you want to achieve and how you think would be the best way to go about it. Break the project up into clean, manageable milestones and use a checklist to keep track of what has been achieved, what need to be done next and which tasks are being worked on by which members of the team. Pick an intuitive/familiar environment to program in that meets the requirements of your project. Practice using a version distribution application such as Git to help keep synchronization simple and working versions backed up in case something goes wrong further into the project, especially for large scale projects. Remember to communicate with your team and to ask for help if you're stuck, an unbiased set of eyes may notice something in your code that you would otherwise have missed.

References

Coding Challenge #91.1: Snakes & Ladders - Part 1
https://www.youtube.com/watch?v=JrRO3OnWs5s

Memory Match JavaScript

https://www.youtube.com/watch?v=ZniVgo8U7ek

React Snakes & Ladders:

https://github.com/yarsunny/react-snakes

React Memory Match:

https://github.com/WilliamMayo11/react-memory-game