Morgan Hodge

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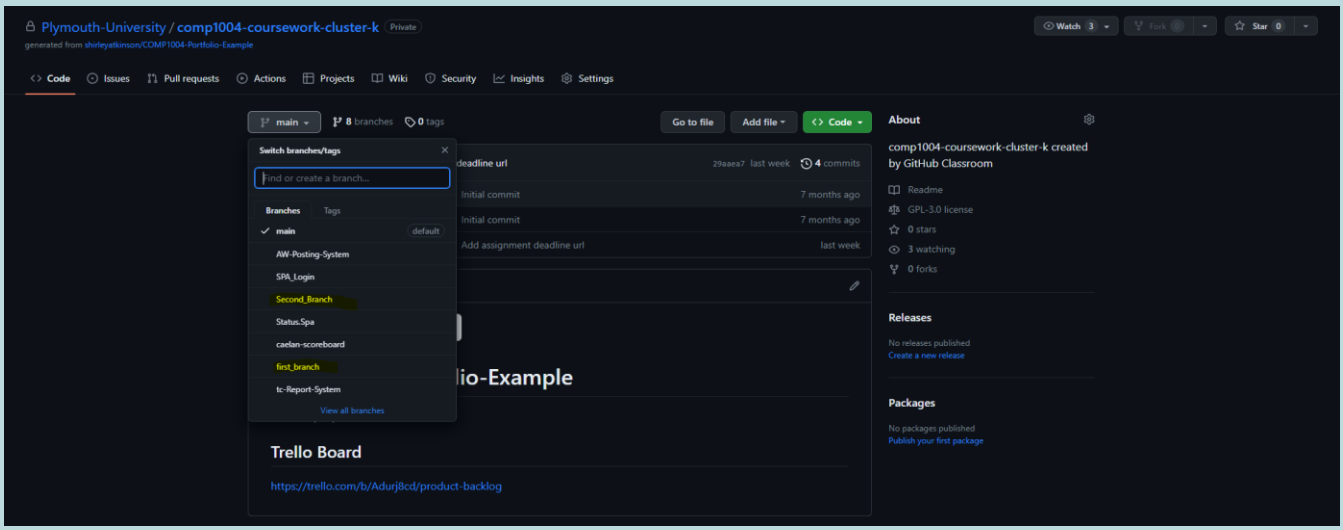
Individual Work

GitHub

Repository Link: https://github.com/Plymouth-University/comp1004-coursework-cluster-k.git

Throughout this project we were asked to commit to git any changes made on a regular basis, multiple times a sprint. However, changes were made to the original brief which led from this task being a group project, to an individual project. This change affected how I was going to use git, as we had been assigned a single group repository. The outcome of this change was that I was going to still be using the group repository, but with my own branches to identify what work is mine.



Here I have highlighted the first two branches I created so you can get an understanding of what work is mine. The other people in the repository have labelled there branches as other names whereas my branches are labelled First Branch, Second Branch, etc.

Please note in order for the game to work the user must have a web server launched, or what I did was install an extension on visual studio code called “Live server”. When trying to launch the game please open with visual studio code and rightclick on the .html file and click launch with live server.

Product Vision

My product is a 2D snake game. I was assigned with the job of creating a game by using basic web development tools, I was not allowed to use any type of game engine. As I was limited to basic web development tools, the game was made with HTML, JavaScript, and CSS. The game I created was meant to connect with other technical aspects such as a scoreboard, friend system and more. However due to unforeseeable changes in the project, only the game was created.

The target audience of this product is anyone over the age of 3 as toddlers are most likely not going to understand how to use a keyboard. This game is not targeted for any specific gender or age range as everyone can play and enjoy a simple 2D snake game, whether it's to pass time or to play competitively with friends. The game can be played by anyone due to its simplicity, the only controls to learn are the arrow keys and the objective of the game is very simple, yet fun and addictive.

I completed the assigned task as I have a working game. In my previous interim report, I explained how I was going to be using JavaScript as the main language for this game. Prior to this project I had no experience in using JavaScript, so this was a massive learning step for me. As stated previously, I was not allowed to use any game engine for this task, this left me with a few options on what I could use to create this game.

My first choice was a JavaScript framework called 'Phaser', this was my first choice as it includes a variety of pre-designed libraries and frameworks for games. This would have been an ideal choice as it would come with already programmed functions and other features to allow game creation to be done efficiently and with ease. This however did not go to plan as I faced a number of issues with Phaser, such as the website that you download phaser from was undergoing maintenance, and still is. I was still able to download phaser using the way back machine, which is a website that allows you to access old versions of a site, so that problem was solved. The next problem I faced was setting up a virtual server to run the game on as phaser only works if there is a virtual server for the .html file to run on. I installed a server software called 'WAMPA' to overcome this issue, but I faced another issue with setting up the server.

Due to all these issues, I was facing and the deadline getting closer I decided not to use Phaser and to go with vanilla JavaScript, with no frameworks. I made this decision as learning plain JS would be faster than setting up another software, also due to the fact I did not have many other options on what software/frameworks I can use in this project as we had limited options.

In the interim report I stated my product goal was "The outcome goal for our project is to create a social network that users can use to communicate with friends, this can be done via direct message or by posting a feed. The project vision for my task is to create a working mini game that makes the user want to log back on and play more". Since then, the project changed from a group project to an individual project. However, my product goal for my task stayed the same, to create a working mini game. And this goal was accomplished.

Project Plan

This project required me to learn an understanding on how to write in JavaScript. I learnt this by using resources on the DLE and by practicing writing small sections of JS that helped me build my skills and get stronger with the language.

What is required for the project:

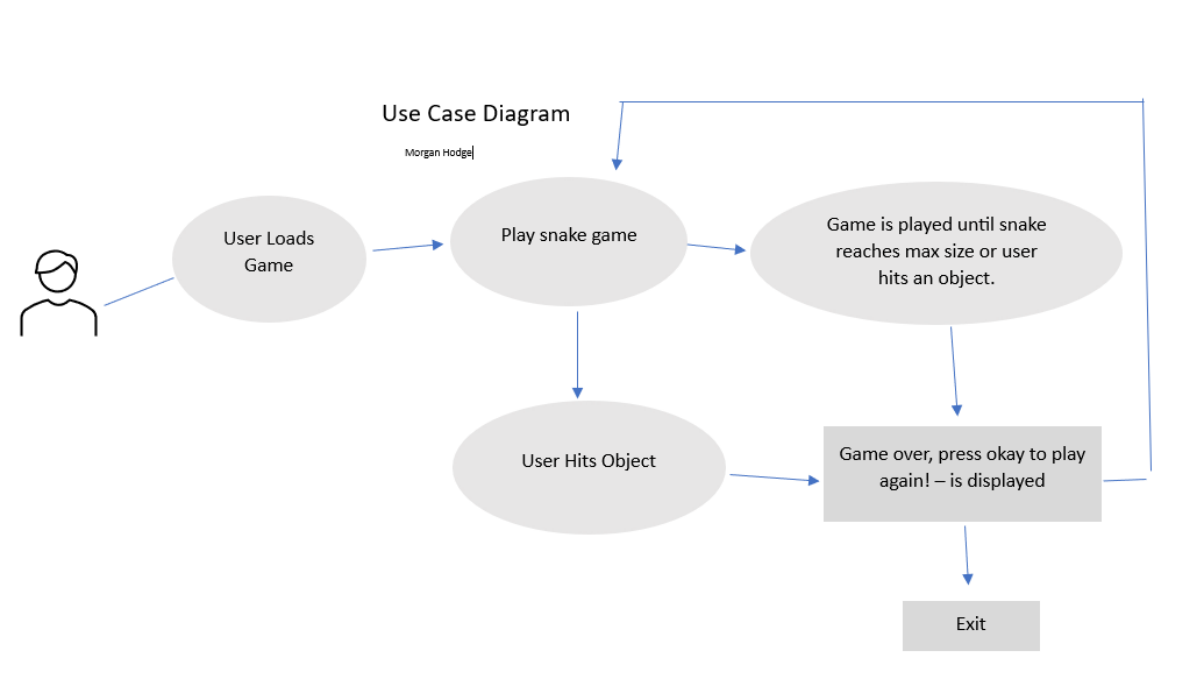
- Software to write the code: Visual Studio Code
- Device to run software on: PC, Laptop
- Web browser: Firefox (I chose this web browser because when using De-Bugger, it is clearer to read for me personally)

Sprint Plans

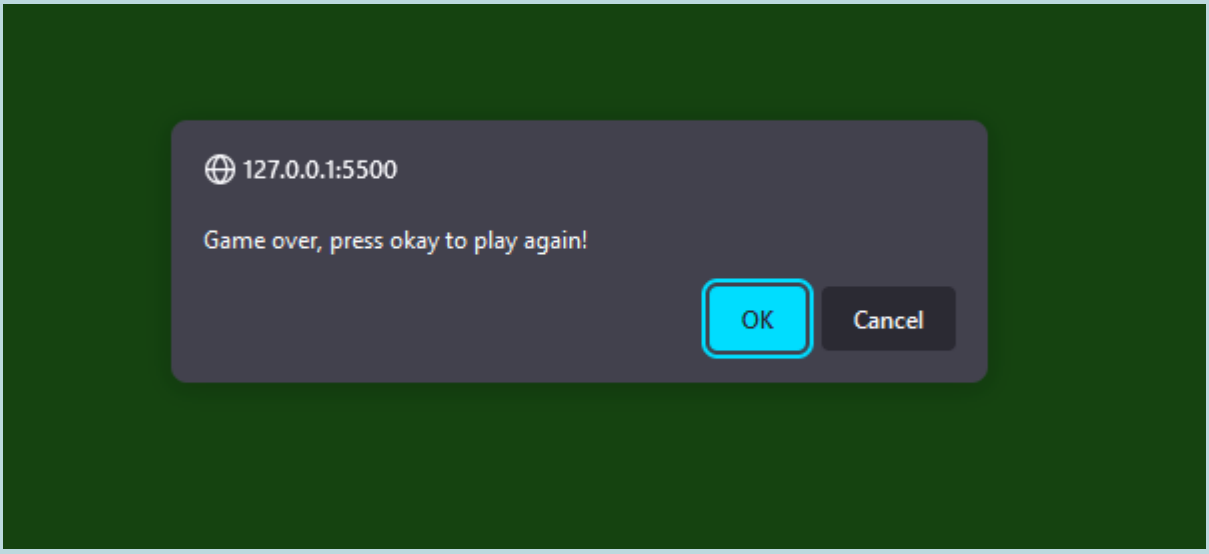
Implementation plan

Sprint	Date	Outcome
1	20.04.2023	The first sprint was creating a basic plan of what the game should look like. This was drawn on a rough piece of paper and shows an image of a snake with a grid background and 2-tone colour.
2	28.04.2023	I finished the styling of the game, snake colour, food colour, created the objects and the grid. Once this was finished, I pushed my work to git and created the first branch: https://github.com/Plymouth-University/comp1004-coursework-cluster-k.git
3	9.05.2023	During the third sprint I finished the html and css side of the project. I pushed this to git as my second branch: https://github.com/Plymouth-University/comp1004-coursework-cluster-k.git .The next step was to start the movement.
4	14.05.2023	There was a period of time between the 3rd and 4th sprint where I did not upload any changes to GitHub until the finished version. During this time, I worked consecutively for days until the game was complete and the finalised version is branch three https://github.com/Plymouth-University/comp1004-coursework-cluster-k.git .
5	14.05.2023	Testing the game

Bellow is a UML diagram that was implemented into the game, I have also provided photos of the code that was used to display the text, as well as the text being displayed in the game.

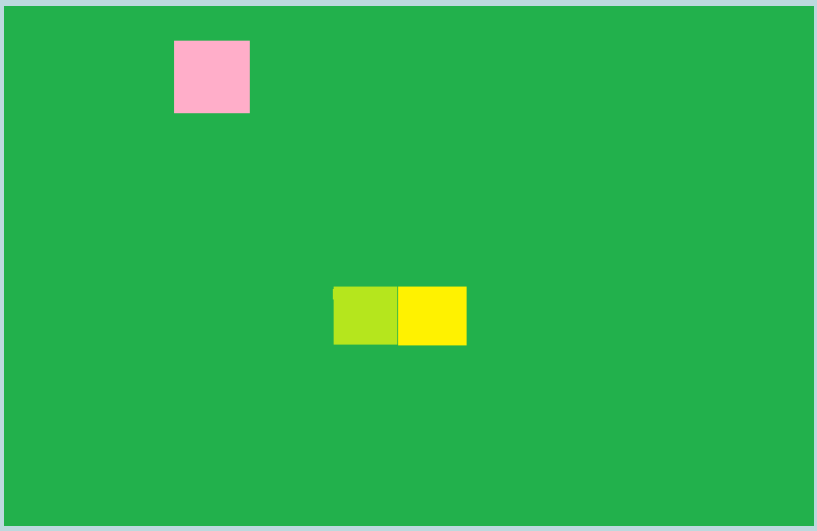



```
function main(currentTime) {
  if (gameOver) {
    if (confirm('Game over, press okay to play again!')) {
      window.location = '/'
    }
    return
  }
```



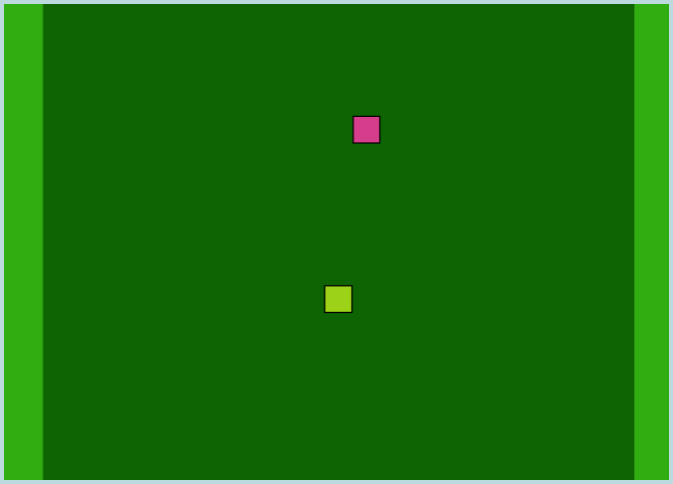
Design

In order to get an understanding on what I wanted the finished game and the objects within the game to look like I created a sketch online:



This was the first and only design I created for this game, as it is a simple 2D snake game using pure js there is not much else visually I can implement.

The finished product looked like this:



My first design was very similar to the finished product as I kept the same colour scheme. The light green is meant to represent the snake, as the food is ate the snake will expand by a variable multiplier which I can change. The light pink object represents the food, the snake can interact with this food by crossing paths with it.

The snakes speed can be changed as well as the food multiplier, the snakes speed can be set to anything the user wants, but I have left it on 5 as I feel this speed is most comfortable with casual gamers.

```
import { getInputDirection } from "./input.js"

export const SNAKE_SPEED = 5
const snakeBody = [{ x: 11, y: 11 }]
let newSegments = 0
```

Project Backlog

1 .Game Mechanics

User Story: As a plater I want the snake to move and respond to user input to navigate through the game grid.

Tasks:

- Set up the game are and grid system
- Implement snake movement mechanics
- Handle the user input for controlling the snake
- Implement collision detection with the walls and snake
- Game over message

2 . Food Generation

User story: As a player I need food to be generated on the game so the snake can eat and expand in size.

Tasks:

- Design food
- Implement random food generation mechanics
- Detect when the snake eats food and trigger response
- Increase the snake’s length upon eating food

3. Game Over

User Story: As a player I want the game to end when the snake collides with walls or its own body, also the option to restart straight after game over.

Tasks:

- Implement game over mechanic and trigger the end of the game session
- Display game over message
- Provide an option to restart/play again

Evaluation

Product Review

In order to ensure the product has no errors and is fully operative, I have created a test plan where I will demonstrate tests on features of the web application. This test plan was created in the previous interim report and now I am applying it to the product. Changes were made to the previous test plan, in the previous test plan there was tests for parts of software that no longer exist due to the change from group to individual work. Due to this fact I excluded the tests that are no longer relevant and added more tests that target my product.

Test Case Type	Description	Test Step	Expected Result	Status
Usability of game	Ensure the game runs and works without any errors or bugs	Test play the game for multiple hours checking for bugs	The game is expected to run fine without any errors, if any occur than the code will be debugged and tested until the game is working	Pass
Possible game crashed	Once the game is launched check to see if it instantly crashes	Launch the game on different types of PCs and browsers to see if this may have an affect on the game crashing	The game should launch without any crashes	Pass
Once game is completed, game ends	Once the snake has reached maximum size, end message is displayed	Reach max length and see if the game ends	The game should display “Game over, press okay to play again”	Pass
Correct object collision ends game	If the snake touches or collides with own body or boundary game ends	A test to Make the snake collide with itself and a test to make the snake collide with boundary	The game should display “Game over, press okay to play again”	Pass
Movement works	Arrow keys should move the snake in the corresponding direction	Test that up= moves snake up, down = moves snake down, left and right = move snake left and right	Snake should move as expected	Pass

User Stories

In my interim report user stories were created, the problem however is that at the time the objective was different. I had been working as a team and there were multiple deliverables, and all the user stories were heavily focused on other aspects of the project, so much so that there were no user stories for the game (my deliverable). Due to this change and now that I am working individually, I have created user stories for the game, and they will be implemented below.

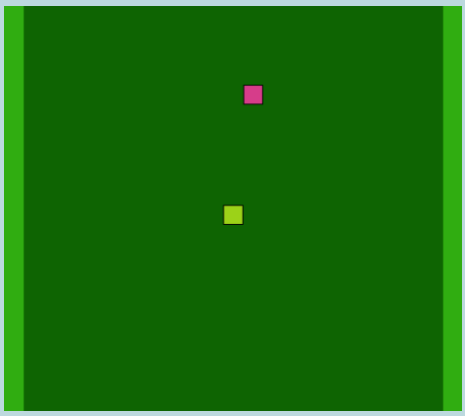
User Story 1: As a Video Game enjoyer I want a game that offers a challenge so that it keeps me engaged.

User Story 2: As a person who lacks computer skills, I want a game that can be easy to play and has easy controls.

User Story 3: As a colour-blind person I want colours that are easy to tell the difference between.

User story no	Test step	Expected Result	Pass/Fail
1	Check the game is a challenge, do this by getting multiple friends to play the game	The game was as challenging as the person playing wants it to be, the game is easy to play but extremely hard to fully complete	Pass
2	Check the game can be played with ease, I did this by asking multiple family members that lack computer knowledge to play the game, after a simple explanation on how to play	The game is simple to understand, there is only 4 buttons to learn, and each button is self-explanatory as they are arrow keys.	Pass
3	Make each colour different so a colour-blind person can tell the difference between different objects	The game should be able to be played and understood by a user that may have visual problems	N/A (I don't know anyone who is colour blind)

In conclusion the user story and web application testing were a success. Every test passed in the web testing, and almost every test passed in the user stories. The only issue I faced was the user story test for colour blind people, I do not know anyone who is colour blind so I could not run a fair test. To try and resolve this issue, every colour in the game is different, the game is made of four colours, pink, yellow and light and dark green. I did this in aim that the users would be able to identify the different colours and what they represent.



Project review and reflection

The main objective of this project was to produce a working web game, and I believe I have accomplished this.

Throughout this project I faced many struggles, the first struggle I faced was when the project went from being completed with a team, to individual work. This happened due to unforeseen circumstances and because of this all the work was allocated to each member individually.

Prior to this me and one other member of the team were going to be creating this game together, he was allocated the task of creating a scoreboard for the game, and making sure it ran efficiently on a web server when the time came to combine each separate part. Because of this transition into individual work, the combined work we had planned fell apart. The final product I created was a standalone game, there is no scoreboard and the game can only be ran by using the .html file. If I had more time on this project, or if we were still working as a group, I am sure that the original planned features, that being a scoreboard and being able to run off the internet would have been implemented.

The second challenged I faced was a struggle with the technology, as I stated in my interim report, I have had no experience with JavaScript before. This stood as a challenge to me as I had to use resources on the DLE and various online sources to help me gain a better knowledge of the language. I overcame this challenge and now I have a clear understanding on the language.

I believe this project could have been more successful if it was approached differently. What I mean by this is if I knew I was going to be doing an individual task from the start than I would have produced a much more detailed and complex game. I would have written a completely different interim report, the aims would have been different and the process to completing these goals would be different. However, I still believe this was a success as with the issues faced, I still produced a working snake game, as I said I would.

If I could conduct any further work to this project, I would have liked to add a level system. I wrote in my interim report how I wanted multiple levels to this game, for example a beginner mode, advanced mode, etc. I would have also liked the option to control the snake using w,a,s,d.

In conclusion I believe overall I succeeded. The game is complete and works as intended, the tests pass, and I have met the criteria.