

"A Snake game with the ability to show complex numbers coordinates"

Adviser: Mr. tt - Computer Science Teacher

Client: Mr.ak - Teacher, enthusiastic gamer

Criterion A:

Identify the Problem

My client, Mr. ak, is my math teacher and his students are interested in educational games especially if the game can prepare students for topics that will be required by ib and sat exams. Furthermore, Mr. ak and his students occasionally try to play some online classic-retro games. Their favorite game at the moment is the 'Snake' game.

There is a downfall in students' grades after the complex numbers coordinate system topics. Although the coordinate plane is not different, it is difficult for students as the gap between topics covered is about two or three years. Thus, I had an idea to combine my math and computer science knowledge and produce a math snake game.

The snake game is a good way to learn the location of the point on the system of coordinates. Even though the game is well-known, my math teacher asked to include a tutorial in case someone never heard about the game before. The snake game will display the location of each apple(or any other snack) eaten by the snake in coordinates of the complex number. The game will have only arcade mode, however, the user can switch between two different designs of the game.

The game is designed to be played on the laptop, due to the bigger display and the ability of multitasking, thus the game will play as a secondary learning source time. To make the game more interesting I decided to propose a score count.

I choose Mr. tt as my advisor since he is my computer science teacher with great programmer skills and mentor experience, who will be able to aid me with programming issues that I will face.

280 words

The Rationale

The game will look like a replication of a snake game, however, it will show the coordinates of the snack that is located at a random. The design will be simple so that students can focus on the coordinates - the primary focus of the game. I will create the snake, snack, walls, and score counter. I will need to also use math functions that will allow me to give a random point where the snack can be spawned.

To ensure that all my functions and objects could be in an online document, I used Javascript(JS) due to its interactivity with web browsers. This connection allows me to constantly switch between both files. The program will be an online game, so it will be faster to access it without any errors that occur when transferring files. Moreover, JS allows web pages to have object movement and scroll transitions. By comparing different languages, I found the advantage of using JS and HTML. With back and forth movement and some features that the language included, I could create a plan for the educational game.

183 words

The Success Criteria

- To have a simple menu: simple instructions before the game
- To have a link or a button that directs to the game from the instruction
- To have a randomly spawning snack
- To have a score at the top of the canvas
- To be able to pause the game, resume the game by pressing space
- To have a 2D array - snake
- To make sure that the snake can eat the snack
- To make sure that the snake grows with each snack
- To make sure that score changes in response to snack disappearance(eating)
- To make sure that when the user presses up, left, right, down arrow key snake goes up, left, right, down
- To make sure that if the snake goes up it cannot go left(same with the opposite to each other directions)
- Snake cannot go over the walls, else it is a game over
- The snake should grow as soon as it eats the snack
- The coordinates should be at the top
- The coordinates should change in response to snack coordinates change
- The button New Game should reload the page
- The color of the coordinates should change
- After game over, banner with a game over should appear
- The snake should have a constant speed
- To make sure that snake is transparent - can go through itself(clients request)
- The color of the snake should change when the score is 10
- The canvas color should change once it heats a score of 10