Formal Project Proposal – Snake

1) Demographic Data:

> **Brady Carlson**
> (801) 634-7515
> bradycarlson@mail.weber.edu
> W01223547
> CS4800 – 1 credit hour

2) Project Description:

I intend on making a version of the classic game Snake. My project will consist of developing the game to include my own design, animations and sounds. The game will be available online and playable on multiple platforms (Windows, Mac OS, etc.). Below is a list of requirements for this project.

- The game will be written in Java.
- The game will be available online.
- The game will consist of a game board that has two colors, a border, a snake and a piece of food.
- The snake will have two colors, a head, a tail and a body.
- The snake will start in the middle of the game board.
- The body of the snake will grow by one unit every time the snake runs into, or eats, a piece of food.
- The snake will have basic movements that will be controlled by the player – up, down, left and right (within the borders of the game).
- When the game begins, the snake will move at a constant speed in whichever direction the player chooses.
- The snake's body and tail will follow the path that the head of the snake makes.
- The game ends when the snake either runs into itself or into the border of the game board.
- Each time a piece of food is eaten by the snake, another piece will appear in a random spot within the game board that is not currently occupied by the snake.
- A score of the game will be kept with each piece of food eaten being equal to 10 points.
- The game will have several customizable features including:
  - Players will be able to choose the two colors of the snake.
  - Players will be able to choose the two colors of the game board.
  - Players will be able to choose the speed of the snake's movements – slow, medium or fast.
  - Players will be able to choose between three game board types – Standard, Fire or Spike.
  - Each game board type will have it's own unique border, music and sound effects.

3) Justification:

The reason I chose to develop a version of the Snake game is because my 13-year-old son asked me for it. He has wanted me to build a game for him to play since I started seeking a degree in Computer Science (which was a long time ago, so he's due). We sat around recently one afternoon and brainstormed ideas for this game and both got really excited for the possibilities of taking a retro game and putting our own spin on it.

Programming is not my strongest area and I feel like this course is a great opportunity to garner the practice and experience I need to become a skilled software developer. I would also like to have an application that I can showcase to potential employers following school. In addition, I'm hoping that the successful completion of this project will make my son proud of our accomplishment and of his contributions.

4) Method:

This project will be written in Java and developed in an Eclipse IDE. I will set aside 6 – 10 hours per week to work on the design, development, testing and implementation of my Snake game. I've learned from previous projects that when I jump in and start programming right away the project is harder to accomplish. Because of this, I plan on spending a great deal of time in the beginning researching, planning, developing class diagrams and making quick prototypes as proofs of concept. This way, when I begin writing code I will have a clear understanding of what needs to be done.

5) Resources:

To successfully complete this project I will lean on the knowledge of my instructors and peers. This semester I am enrolled in Java Application Development (CS4230) and Advanced Software Engineering (CS4750) and believe these courses will further my knowledge and understanding of developing Java applications. The project in CS4750 that I am working on will be a web based volunteer tracking system for Catholic Community Services and it will be written in Java. In addition to the resources available to me at Weber State I will reference my "Core Java" textbooks and will utilize the training videos available through Pluralsight. If none of the above resources are able to answer my questions I will search the Internet for blogs, videos and sample code.

6) Evaluation:

My effort on this project should be evaluated and graded based on the successful completion of the above stated requirements. For example, if I fail to include one of the customizable features, that should negatively affect my grade because I did not deliver the agreed upon functionality. Conversely, if I adequately achieve all my stated goals, then the evaluation and grade should be favorable.

The mileposts that I've set for myself can be read in greater detail below. Essentially the project will progress from design, to implementation in stages and consistent, thorough testing. The project will progress in small, segmented steps as I attempt to successfully complete each of the project requirements. I've found that a larger project is easier to do if it's broken down into pieces and put together one segment at a time.

The demonstration of my project will be done on a computer with Internet connectivity. I will showcase the website for my Snake game and play the game several times presenting the overall gameplay, design, features and functionality. I will also encourage the instructor to test the application by playing a game or two. At a minimum the website will have an executable jar file of the game that can be downloaded and played. Time (and technical ability) permitting the game will be embedded and played directly in the player's Internet browser.

7) Milestones:

The deadlines and tentative deliverables for each progress report are below. Reports will be turned in no later than the due dates listed below (and on Canvas). I have purposely front loaded the project to allow myself plenty of time should I run into any problems.

Progress Report 1 Deliverables – Due 20-September
- Design UI of game board (i.e. layout, size, scoreboard, etc.)
- Design game board borders for each type – Standard, Fire and Spike
- Design the snake (head, body and tail)
- Design and record custom sounds including a unique sound for each of the following circumstances:
    - a sound for the start of the game
    - music that plays for each game board type – Standard, Fire and Spike
    - a sound for when a snake eats a piece of food and points are scored
    - a sound for when the game ends by the snake running into itself
    - a sound for when the game ends by the snake running into the Standard border
    - a sound for when the game ends by the snake running into the Fire border
    - a sound for when the game ends by the snake running into the Spike border
- Design menu layout and contents

Progress Report 2 Deliverables – Due 11-October
- Develop class diagrams (including methods, naming conventions and relationships)
- Implement game window (where scoreboard and game board will be placed)
- Implement game board
- Implement score board
- Implement snake (head, body & tail)
- Implement piece of food
- Implement customizable color options for snake
- Implement customizable color options for game board

Progress Report 3 Deliverables – Due 8-November
- Implement snake movement (up, down, left and right – body and tail follow path made by the snake's head)
- Implement snake growth (one unit for each piece of food eaten by head of snake)
- Implement snake speeds (slow, medium and fast)

Progress Report 4 Deliverables – Due 29-November
- Write help docs for game rules and how-to (accessible via the menu)
- Test and fine tune gameplay
- Design website

Final Project Submission Deliverables – Due 14-December
- Implement website
- Put finished game on website (either as executable jar of embedded directly)

At this point the project will be completely implemented, staged online and ready for demonstration. It will fulfill the specified requirements and be a whole heck of a lot of fun to play!