**Paragraph Description**

Our project will be to recreate the class video game “Snake”. The game is a single player game where the objective is to collect fruit and grow their snake to fill the whole screen. Each square the snake collects will increase their size by 1. The player can move their snake in the four cardinal directions using KEY as inputs. The player will lose if the “head” collides with any part of their “tail” which is any part of the body. The player will be able to go through the sides of the screen, and their head will subsequently appear on the other side. NOTE, the head square will be red for clarity, while the rest of the body will be white. The game will display a scoring system with the HEX displays in decimal. After the player loses, there will be a title screen shown, and the player can subsequently retry by pressing any of the KEY inputs. The tick rate will be twice per second. The player will be able to see high scores for the session using switches in binary which will show up on HEX displays.

**Milestone 1:**

We will be able to display the X, Y coordinates of the player on the hex display (Hongyu) and modify the direction of the user travel with the KEY inputs. (Darwin)

**Milestone 2:**

Draw the snake on the screen and have it move based on user input (Darwin). Snake will have fixed length and will implement collision based on that (Hongyu).

**Milestone 3:**

Add random spawn of fruit blocks and high score system (Hongyu), as well as snake length growth and title screen(Darwin).

**Project Motivations**

Our project will need implementations of various modules throughout the course, including rate dividers, datapaths, VGA adapters, as well as memory and user interface.

It’s cool because we get to put everything that we learned together into one cumulative project. We also get to pretend like we’re in the 70’s, using assembly to write complex programs such as a game. It will also be cool to people outside of 258 because displaying stuff on a screen using nothing more than a circuit board is enthralling.

I have implemented Snake before in various other programming languages, and it would be interesting to see the contrast in implementation on a hardware level.