

0. Overview:

For our Project, we propose a snake-game.

1. Peripherals:

1. 8x8 LED display (Driven by and interfaced to by a MAX7219 vis SPI)
2. 2-digit 7 Segment display (Controlled by 4511 BCD to 7 segment display drivers)
3. LPC 4088 development kit for control (4 direction stick, pause and reset buttons)

2. Software design:

This snake game will feature game logic that relies more heavily on hardware properties/resources available. Assuming the game objective is common knowledge, there are a few things that are worth pointing out.

Each game cycle will occur and progress as the result of an interrupt fired by a timer. This allows us to increase “difficulty” by adjusting the timer register value each time a milestone is hit (collection of an item that increases the snake’s segment, or an amount of time passing, for example), resulting in less time for a player to make decisions.

We will also utilize the controls/buttons on board. The interrupts fired by the stick and pause/reset buttons will be saved and be taken into account on the next game cycle. The specific implementation of how we will handle pausing and resetting is to be determined.

On the peripheral side, we will output the game “screen” to an 8x8 LED display. We will also show the score (snake length) on a 2-digit 7 Segment display. How we will implement how to translate the game “screen” to the LED display relies upon on the way the LED display accepts data, and most likely be a prime area to focus on.

Bonus goal: create neat states for win and lose conditions to demo flashing LED patterns (e.g “U WIN” or “U LOSE” with LED patterns repeating behind them).

3. Goals:

The goal of this project is to reproduce a game structure that is more reliant on lower level understanding (maybe like the old days of pinball machines?). Interweaving our knowledge of software design for the game logic, hardware wiring for the peripherals, and the knowledge of interfacing them all gained from this course, we are presented with the chance to exhibit the skills we’ve gathered in our courses up until now.

3. Group Responsibilities:

As it currently stands, Marco’s main focus will be designing the game logic and structure. Brent’s primary focus will be on developing the interface to enable communication between the game,

peripherals, and the player. At any point we deem appropriate, there may be overlapping to assist and review the work of each other to increase productivity.