CSM152A Final Lab Proposal

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Overview

Also, another team is going to develop the game Snake.

For this project, we will create a modified version of the game Snake. In our implementation, we will add a second player to the game as well as a power-up functionality. The game will be displayed on VGA. Players will use two joysticks or keypads (depending on class availability) as inputs to control their respective snakes. There will be no counting scores, however; instead, the color of the winner's snake will be displayed on the seven segment display after the game ends.

Game Mode

In this game, both players will start with a snake length of 4 near the center of the map. The goal of the game is for one snake to outlive the other snake while retrieving food items to increase body length, making it harder for the opponent to maneuver and survive. When a special food item spawns, the snake who eats it will temporarily receive a speed boost. The game ends when the head of a snake hits the body of a snake or a wall. The game can be reset by pressing a button on the FPGA board, which will then cause both snakes to be reset to their original default length and position.   What is going to be happened if two snakes hit each other?

Score Mode

The game ends when either of the snakes die from crashing into a wall or a snake body. At the end of each game, there will be three possible outcomes to show who won. The 7-segment display will show:

1. "RED" if the red player is still alive after the blue player crashes.
2. "BLUE" if the blue player is still alive after the red player crashes.
3. "TIE" if both players crash at the same time.

Grading Rubric

Game Display Functionality (25%) - VGA will be able to properly display both snakes, the game board, and the food-items on the screen, reflecting and representing the state of the game.

Snake Objects (10% each) - Snake objects will behave correctly, maintaining a certain length and a specific move direction. The head of the snake will lead its movement throughout the game

board. If the head of the snake runs into any of the four walls or a snake body, it will crash and die.

Food Objects (15%) - Food objects will be randomly generated on the board, which increase the length of the snake if eaten. The food objects are generated in the free spaces, not in spaces where snake bodies are currently present.

Game Controls (15%) - Both players are able to successfully control their snakes within the map by changing a snake's current move direction using the hardware input from the joystick or keypad.

Game End (10%) - Game detects when a snake has died and ends accordingly. A snake dies when it crashes into any of the four walls or a snake body. Both snakes will simply stop moving when the game is over.

Winner Display (5%) - After the end of the game, the correct winner is determined and displayed on the 7-segment display.

Reset Game (5%) - When reset button is pressed, both snakes will be set to original size and position to restart the game. After pressing the reset button the new game begins and the snakes will move again.

Power-up (5%) - Special power-up food items will be occasionally generated that look different than typical food items. When eaten by a snake, the respective snake will increase in speed for a short period of time.