CSM152A Final Lab Proposal

Russell Jew (ID: 604477316)
Jeffrey Jiang (ID: 904255069)

Overview

For our project, we intend to create an implementation of Breakout or Brick (https://en.wikipedia.org/wiki/Breakout_(video_game)) on the FPGA board. This implementation of the game will require the use of the UART transfer as well as a couple of buttons and switches to pause and reset the game, as well as implement the display of scores. In addition, we will have to learn how to use some form of user input, whether that will be the use of the buttons more extensively or the use of the joystick add-on.

Game Description

Breakout is a one player game that will just require the user to interface with a black bar which they can move in the horizontal direction. The remainder of the game revolves around a computer generated layout of bricks, which a ball that is in constant motion will aim to destroy. The joystick will control a bar at the bottom of the screen which will be used to bounce a ball back at a bunch of bricks at the top of the screen. These bricks, if implemented in a more complex fashion, can have varying levels of toughness as well as varying patterns. If the bricks are all destroyed before the player has no lives left, then the player wins the level and can proceed onto the next level. However, if the player cannot get the bar under the ball in time and the ball falls through, the player loses a life. After three lives, the game is over. The score of the player is determined by the number of bricks that he or she destroys.

In addition to the game itself, we would like to have a couple other features to make the game more user-friendly. These features include a pause and reset button as well as an implementation of the highest score, which can be done on either the 7-segment display or the UART control.

Grading Rubric

Game Setup (30%) - Initialize the game. Screen should display the bricks, the paddle, the ball, and the score with the game ready to be played.

User Input Functionality (20%) - Use of the joystick or buttons should move the paddle.

Game Functionality (30%) - The game should run as expected to. The ball should constantly move, destroying bricks and bouncing off surfaces. Game should end when all bricks are destroyed or when the player misses the ball.

Pause / Reset (10%) - Use of some of the buttons should allow the user to pause and reset the game.

Score / High Score (10%) - The score will be displayed on the 7-segment display or the UART control. It will display your current score based on how many bricks were destroyed.