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Lab 4

Game Description

For this lab, I will be creating a breakout game using mBed. In breakout, the player controls a platform that hits a ball towards arrangements of blocks. Upon being hit by the ball, a block disappears, and the ball then bounces back in the other direction. The objective of the game is to make all of the blocks disappear.

Game element summary:

* Button A: move the platform to the left.
* Button B: move the platform to the right.
* Button C: menu button, pushing it restarts the game.
* Button D: activate a power-up if the player has them.
* Temperature sensor: constantly runs, generates power-ups.
* Score: displayed on the LCD.

The game has four buttons. Two of them (buttons A and B) move the platform left and right. A third button (button C) is the menu button and is used for starting the game and restarting once the current game finishes. The final button (button D) activates a power-up when pressed that will alter the game in various ways.

The temperature sensor is used to award power-ups to the player. Once the temperature is below or above a certain threshold for a predefined number of seconds, the player will be given the corresponding power-up. Power-ups include speeding up the ball, making the ball bigger for a temporary period of time, and allowing the ball to “burn” through blocks so that it doesn’t bounce off walls and removes everything in its path. If the temperature reading is below 0 degrees Celsius for longer than 5 seconds, the power-up to speed the ball up is awarded to the user. If the reading is between 0 degrees and 20 degrees Celsius for longer than 5 seconds, the power-up to make the ball bigger is awarded to the user. If the reading is above 20 degrees Celsius for longer than 5 seconds, the power-up to make the ball “burn” through blocks is awarded to the user. The player can only have one of each power-up at a time, and when activated, the power-up lasts for 15 seconds. After a particular power-up is used, the user can regain the power-up if the temperature meets requirements again.

Score will be displayed on the LCD and will be determined by the time it takes the player to hit the next block and the total number of blocks hit. Each time a block is removed, the score will be incremented by 10 points. If the user hits more than one block within 3 seconds, then the score will be incremented by an extra 5 points. The user will lose 100 points each time the ball falls below the platform. Therefore, it is possible to obtain a negative score.

The player starts the game by pressing button C. This loads the game with all blocks, a ball, and a centered platform. The ball then begins moving towards an initial random direction based on the temperature sensor reading. Once all blocks have been removed from the screen, the score will be displayed in large font on the LCD. If at any point the player presses button C, even during the game, Breakout will reset and the score will be cleared.