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CSE 379 – Lab 7 Pre-Lab Writeup

Timer

The timer will once again be responsible for the bulk of the work done in the program. It will initially be set to interrupt once every 533,333Hz (30 times per second), but will reduce with every “paddle bounce”, progressively stepping through values (12 total) until it reaches 266,666Hz (60 times per second). The values will be stored in the program data.

Paddles

These will be represented by ANSI escape characters, which will be redrawn every refresh (with new positions, if a player is moving them). Before moving, the game will check for a penalty – if the ball is moving away from the paddle (and outside of the “grace period”), the round will go to the other player. When the paddle “hits” the ball, it will change the ball’s direction.

The paddle’s positions (y-values) will be stored in the game data, as well as its state (powered up or not)

ANSI escape characters will be covered in lecture.

Ball

Also represented by an ANSI escape character. Once per interrupt, the ball will move in one of six directions (left, right, four diagonal directions). If the ball hits the top or bottom border (only possible while moving diagonally), it will “bounce” and continue moving at the complementary angle (diagonal up/right to diagonal down/right). If it reaches the left/right border of the game screen, a point will be awarded to the player on the opposite side of the screen.

The ball's position (X, Y coordinates) and movement direction (1 of 6) will be stored in the game's data.

Powerups

These (represented by an ANSI escape character) will appear randomly on the field (determined inside code). If the ball connects with one, it will award a player (depending on the ball's movement direction) with a temporarily double-sized paddle.

Randomness will be covered in lecture.

Score

When the ball reaches the left or right borders of the game screen, a player's score will increase. If the score reaches a certain threshold, the game will end and a player will win. Thresholds are set by the GPIO buttons.

Scores and score thresholds will be stored separately in the game data.

Menu

Before beginning play, the players will be prompted to select a score threshold (using GPIO buttons).

The prompt will be stored in program data.

Pause

When SW1 is pressed on the Tiva-C, the game will pause.

The screen will remove the game field and instead prompt the users to "Q: quit, R: resume", while awaiting user input. The game will idle in the background, but nothing (score, movement, time passed) will update until gameplay is resumed.