Team ZHS
Haoqing Dong, Shiqi Wang, ZhouHeng Sun
Lab 4 Proposal
February 23

Lab4 Proposal

Overview

We want to create a single player game inspired by the recently popular ‘Bottle Flip’ game using FPGA board and VGA. A button on FPGA board is used to control how far the bottle jumps between boxes without falling down in the middle, the seven segment display will be used to display the current score.

Game Rule

When the game start, a rectangle-shaped bottle will be resting on a box, which represents the player character. The player controls the bottle with the press of a button. The objective is to launch the bottle onto another box, lying a bit further. If the bottle lands on the box right on the middle, the player is awarded extra points, and all LEDs will flash. If the bottle lands elsewhere, the player is given one point. If the bottle falls too short or too long and doesn’t reach the box, the round is over and player can press another button to restart a new game.

Game Layout

The graphics will be remodeled after the original game, which should be similar to Figure 1. The purple rectangle represents the player figure while the boxes will be spread out on a 2D plane along two axis.

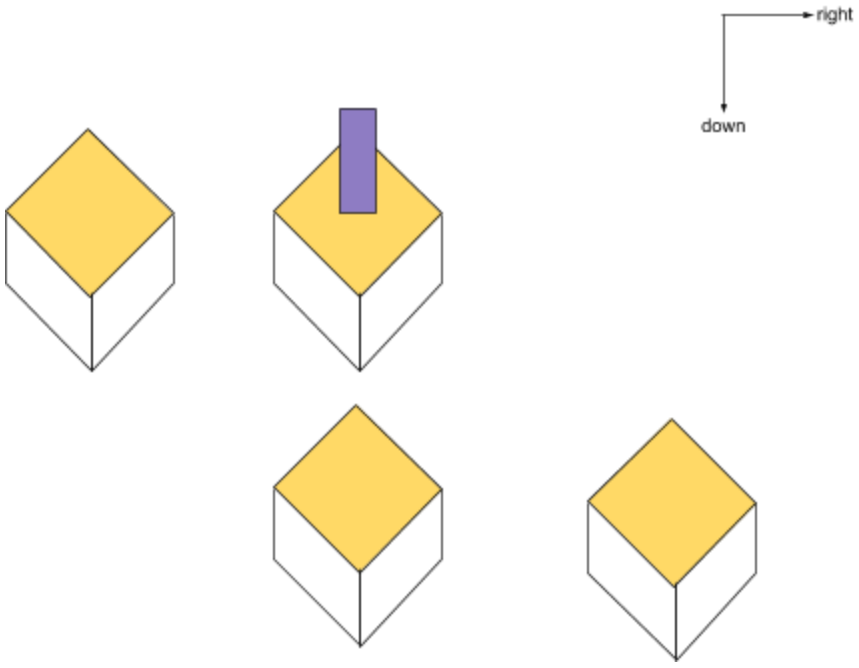

Figure 1. Expected Graphics Layout

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Grading Rubric

Game Logic(35%)

- (15%) Implement jump button correctly. The jump button's signal will be continuously monitored and calculated to determine how long the button is pressed. The ball should jump according to the time length of the button press.
- (15%) Points are correctly calculated. Each time the player makes a successful jump, the points will be given based on whether it's a perfect landing or OK landing. If the player failed to land on the next box, the game end.
- (5%) Implement restart button correctly. When the game end, the player need to press the restart button to begin a new game. Points will be reset to 0.

Graphics Effect(35%)

- (10%) When the player figure is in the air, it will fly in a reasonable trajectory (like a parabola).
- (15%) False-3D effect boxes. Boxes are drawn in a 2D-plane with three different colors for three different faces of the box, which will have a similar appearance as a 3D box.
- (10%) The box will have a random distribution, either right or down from the previous box. The distance between every two boxes are randomized.

LED Flash Effect (15%)

- (15%) When the ball makes a perfect landing, all LEDs will be turned on and flash for a few seconds.

Score Display (15%)

- (15%) The score (0-9999) will be printed on the seven segment display.