LED Ping Pong

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Objective and Requirements.

The objective of this project is to develop a game of “Ping Pong” using the Basic I/O shield’s LEDs to represent the ping pong ball and the OLED graphical display to present the users with a start menu and a score board. In this game, the LEDs will blink back and forth, from the LED furthest to the left to the LED furthest to the right. The objective of a player is to push the button assigned to them when the LED on their side lights up. If successful, the LEDs will blink back towards the opposing side and if not successful, a point will be awarded to the opposing player. On start up, the users are presented with a menu containing a “start game” button and a difficulty option.

- The game supports two player mode.
- The game supports different difficulty levels.
- The users control the game with the buttons and switches on the Basic I/O shield.
- The current score is displayed on the screen.

Solution.

This project is developed using only the supplied ChipKIT Uno32 board together with the Basic I/O shield. The OLED graphical display is used to present the users with a start menu and the switches are used to set the difficulty of the game, i.e. the speed of which the LEDs are blinking back and forth. The display screen is also used to display the current score. The speed of which the LEDs are blinking are defined by the built in timer. Interrupts triggered by the timer verifies if a player either missed or hit his/hers timing when pushing the button.

The source code of this project is written in C, using the MCB32tools.

Verification.

Verification has been done through testing the program with test cases covering all the possible settings of the game. In addition, a number of test cases containing unexpected or in the nature of this game, “illegal” inputs have also been tested and safe guarded against.

Contributions.

Since I am the sole developer of this project, all the work has been done by me.

Reflections.

The game is working well except for a few rare inconsistencies caused by buttons sometimes not registering input when not applying enough weight while pushing them.

After playing the game for a while, a few adjustments to the difficulty levels also needed to be done. In the first versions of the game, the hardest difficulty levels made the game basically unplayable.