FPGA Project

Tic Tac Toe

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Outline

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IDEA

- When the player/ computer plays the game, a 2-bit value is stored into one of the nine positions in the 3x3 grid
- 2'b00 is stored into a position when neither the player or computer played in that position
- 2'b01 (X) is the value to be stored when the player played in the position and 2'b10 (O) is the value to be saved when the computer played in the position.
- Red LED is lit in a position when the position is played by the player.
- When the computer plays the game, Green LED is lit.

Outline

Software Requirements

- Language - VHDL
- Software- xilinx ISE

Outline

Hardware Requirements

- IcoBoard
- LED lights of two different colors

Outline

Implementation strategy

- The player/ computer wins the game when successfully placing three similar (01-Xs) or (10-Os) values in the following row pairs
- Winner detecting circuit is designed according to the winning rule.
- Winning rule– (1,2,3); (4,5,6);(7,8,9); (1,4,7); (2,5,8);(3,6,9); (1,5,9);(3,5,7).
- A detector is to check if all the positions are played and no winner is found.

Summary

- Player wins when 3 consecutive Red LEDs glow
- Computer wins when 3 consecutive Green LEDs glow