



Pong

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Introduction

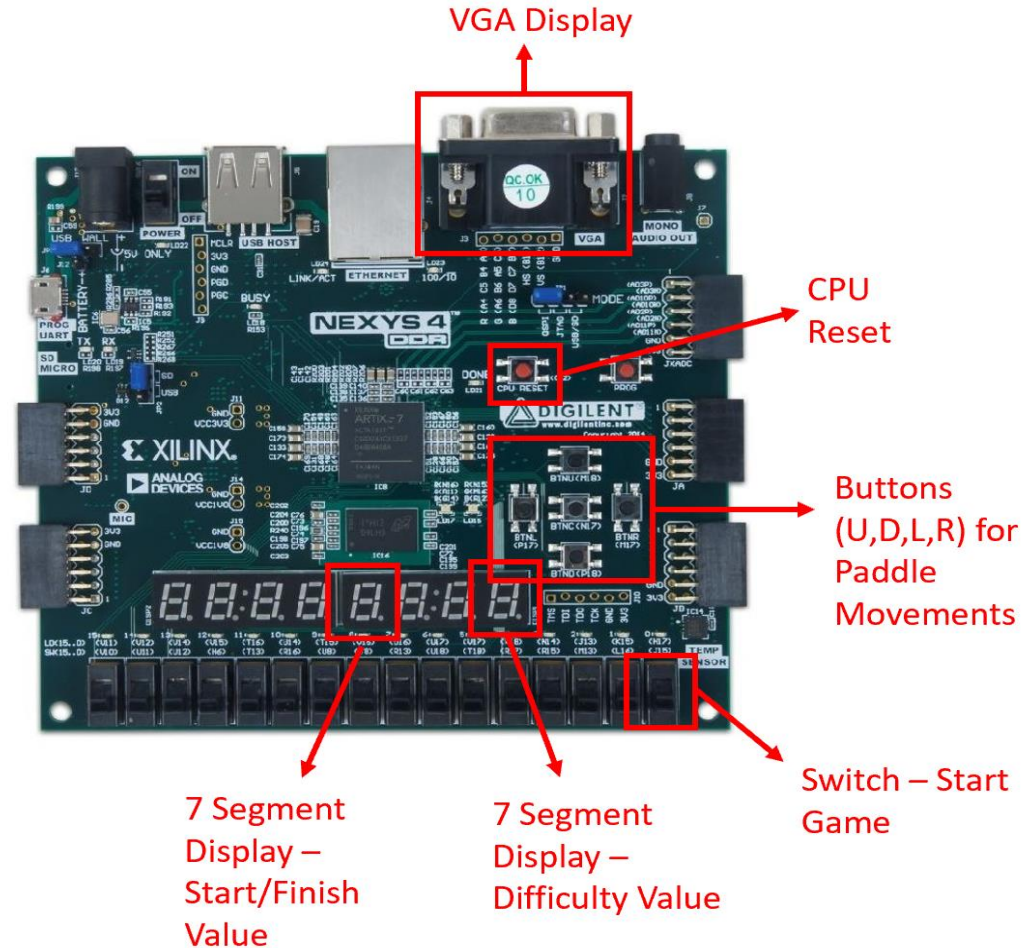
- Pong - Interactive FPGA Game
 - First user to score ball wins
 - If opponent fails to hit the ball, the user loses.
 - Two player based game
- Inputs
 - Buttons (U,D,L,R) - control paddle movement
 - Switch - To start the game
 - Button for resetn
- Outputs
 - VGA
 - 7-Segment Display



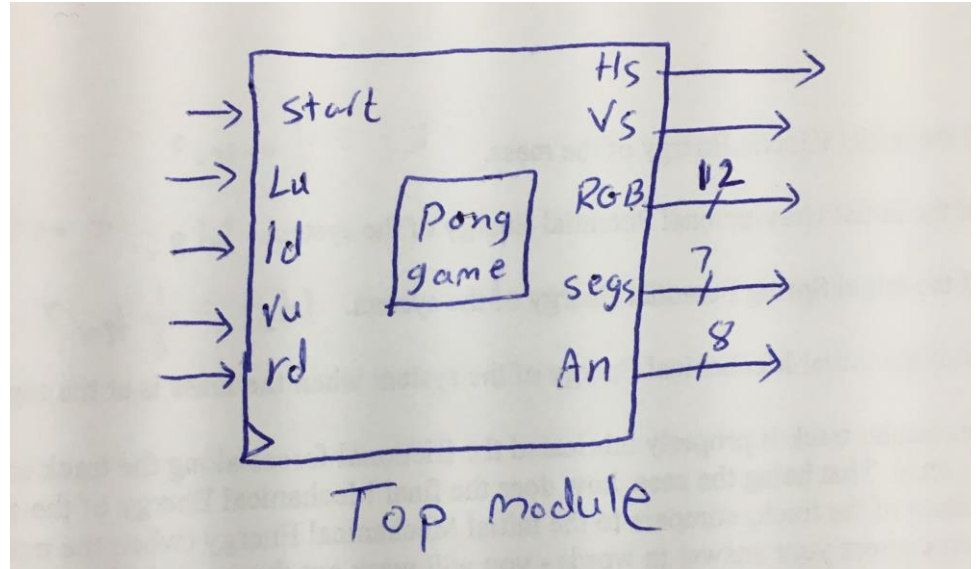
Purpose

- Construct an FPGA game that utilizes a VGA display
- Utilize buttons for paddle movement
- Utilize switch to start the game
- Display hexadecimal output for difficulty and start/finish onto the 7-Segment Display
- Button used as resetn to clear/output

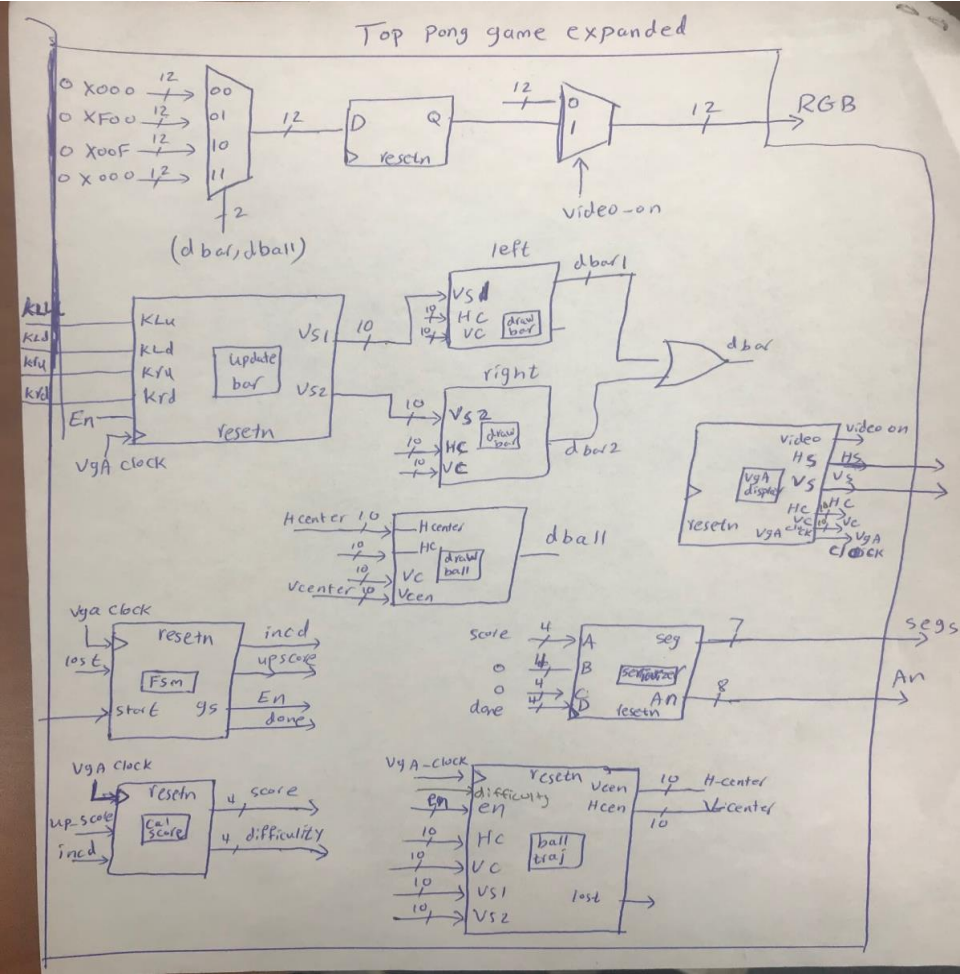
Board Layout



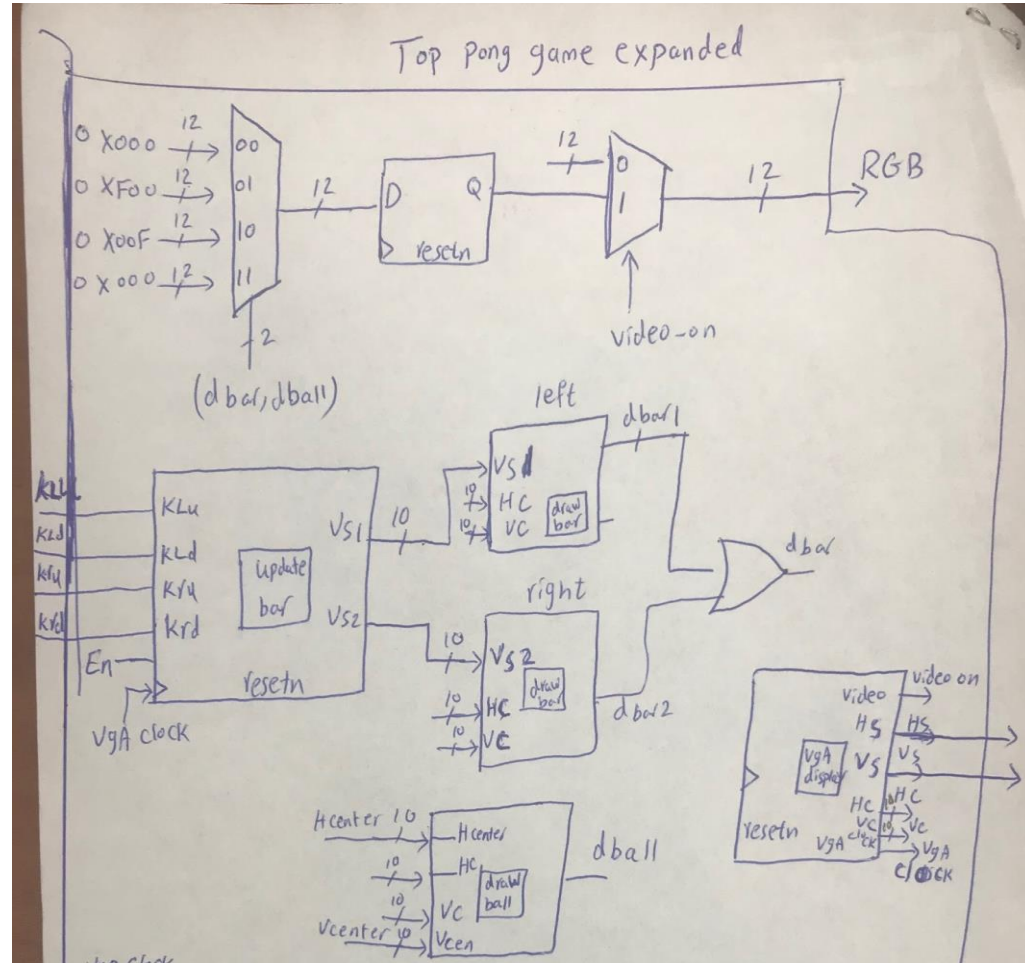
TOP module



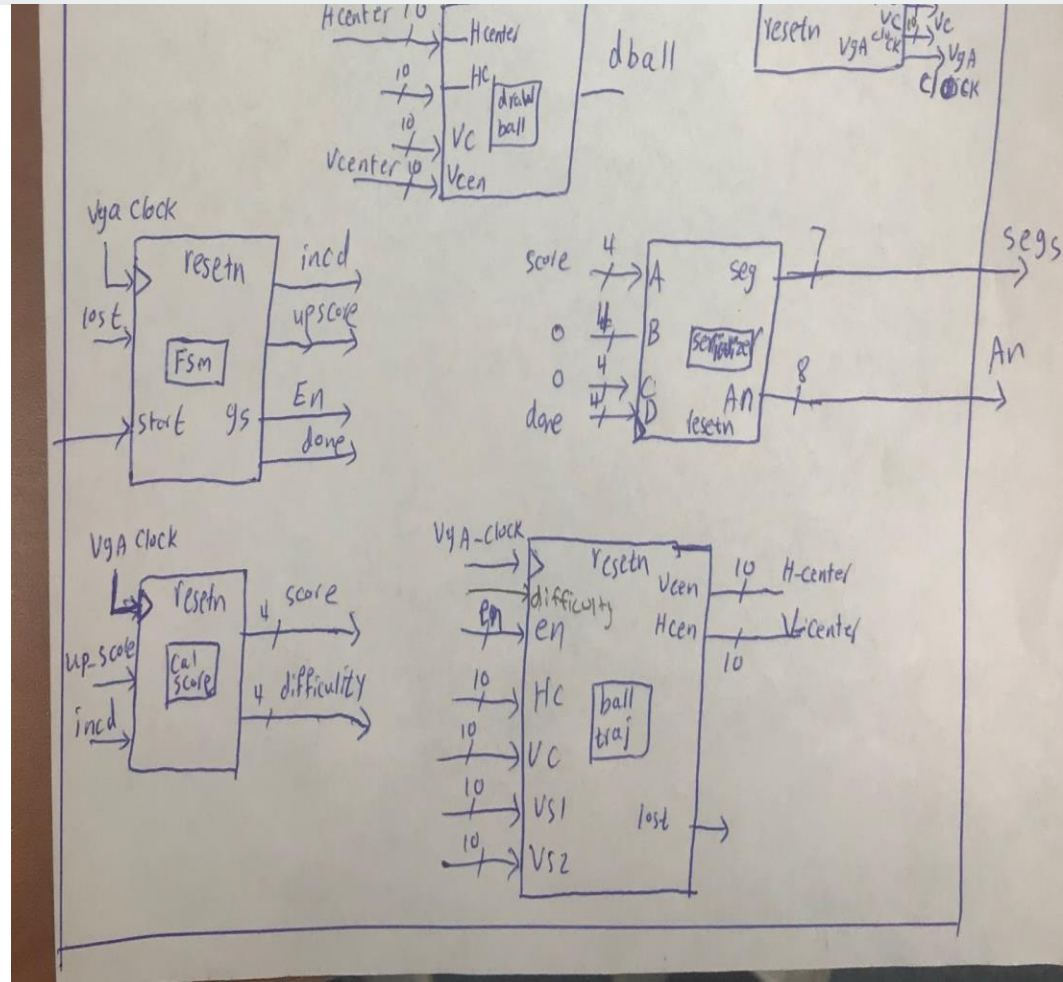
Game Block Design



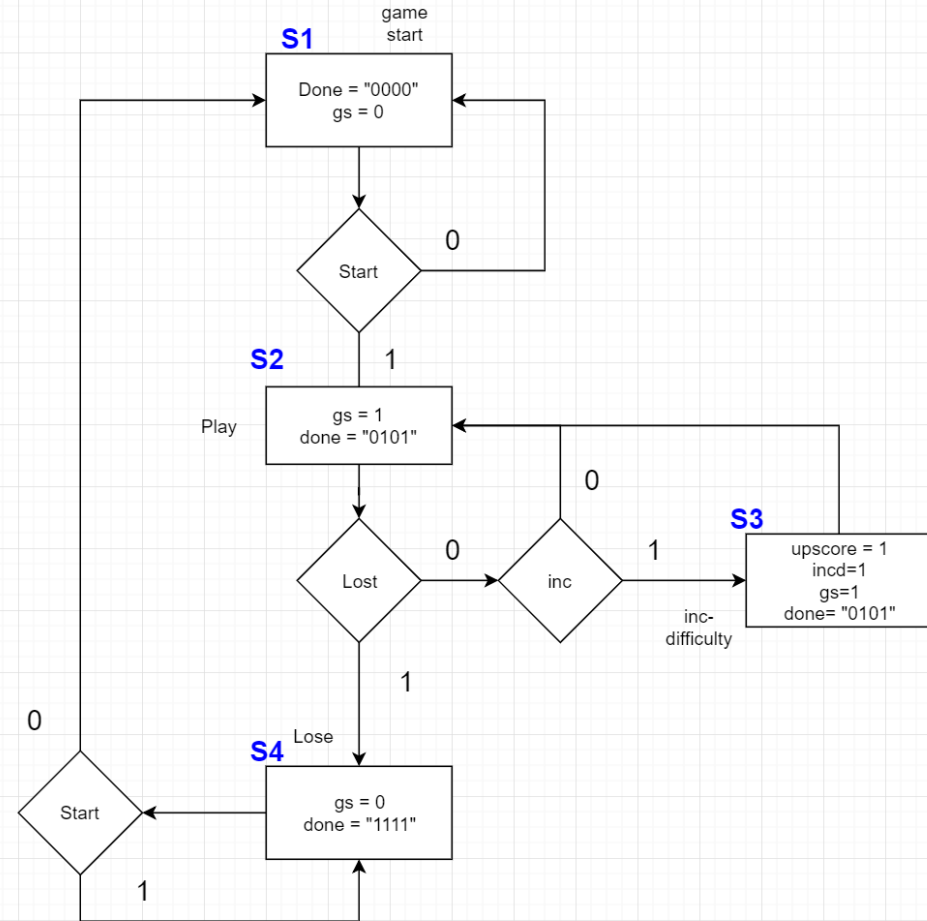
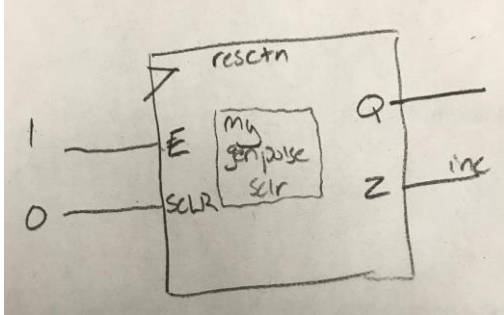
Top Half of Design



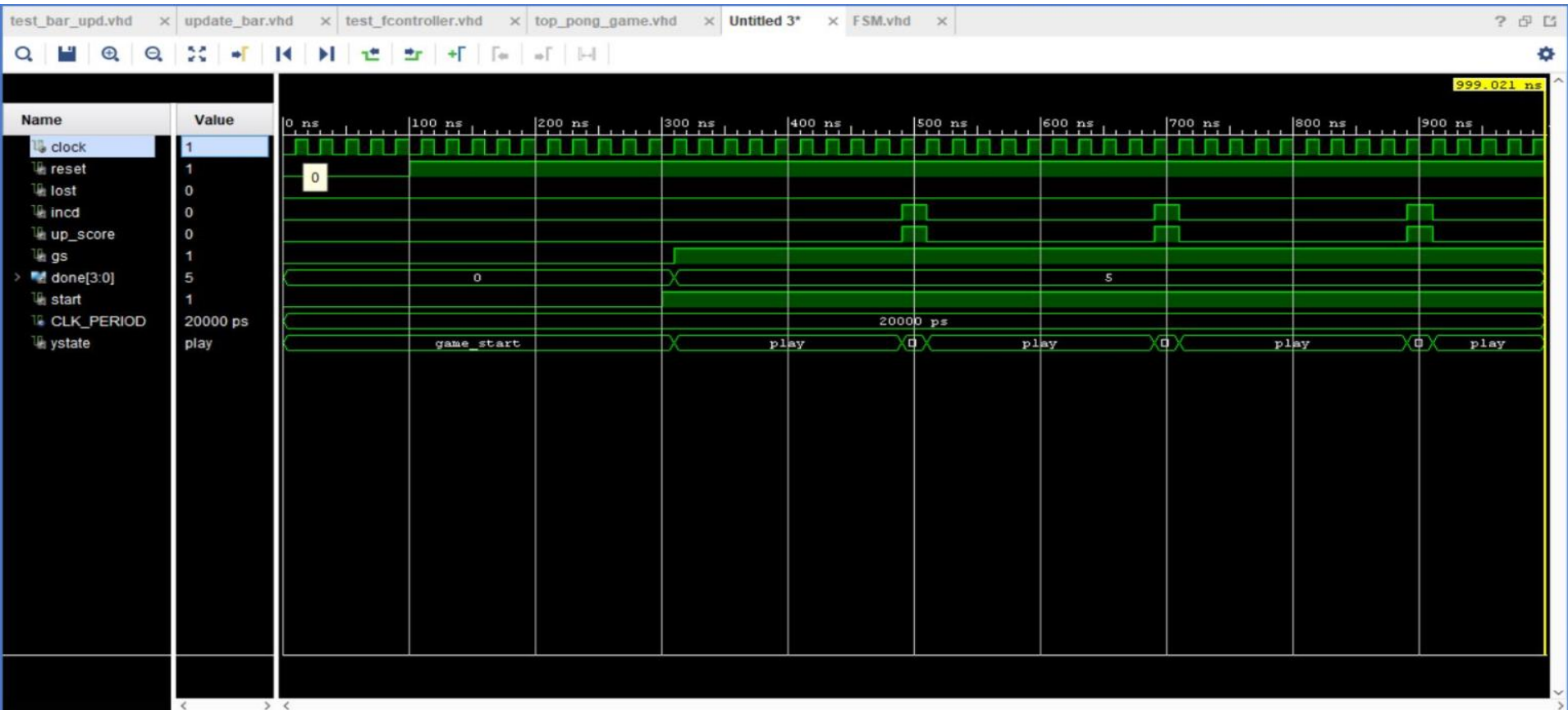
Bottom half of Design



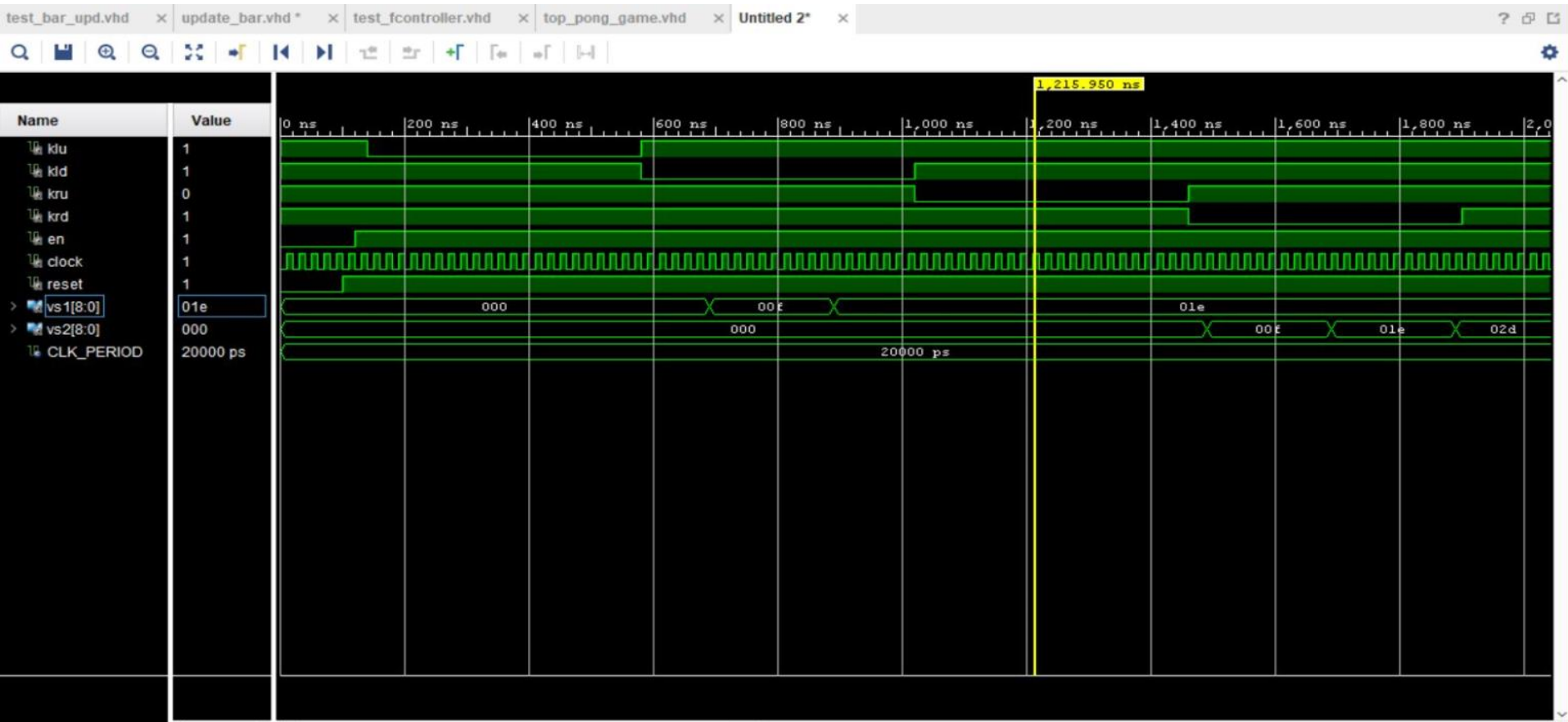
State Machine Block Design



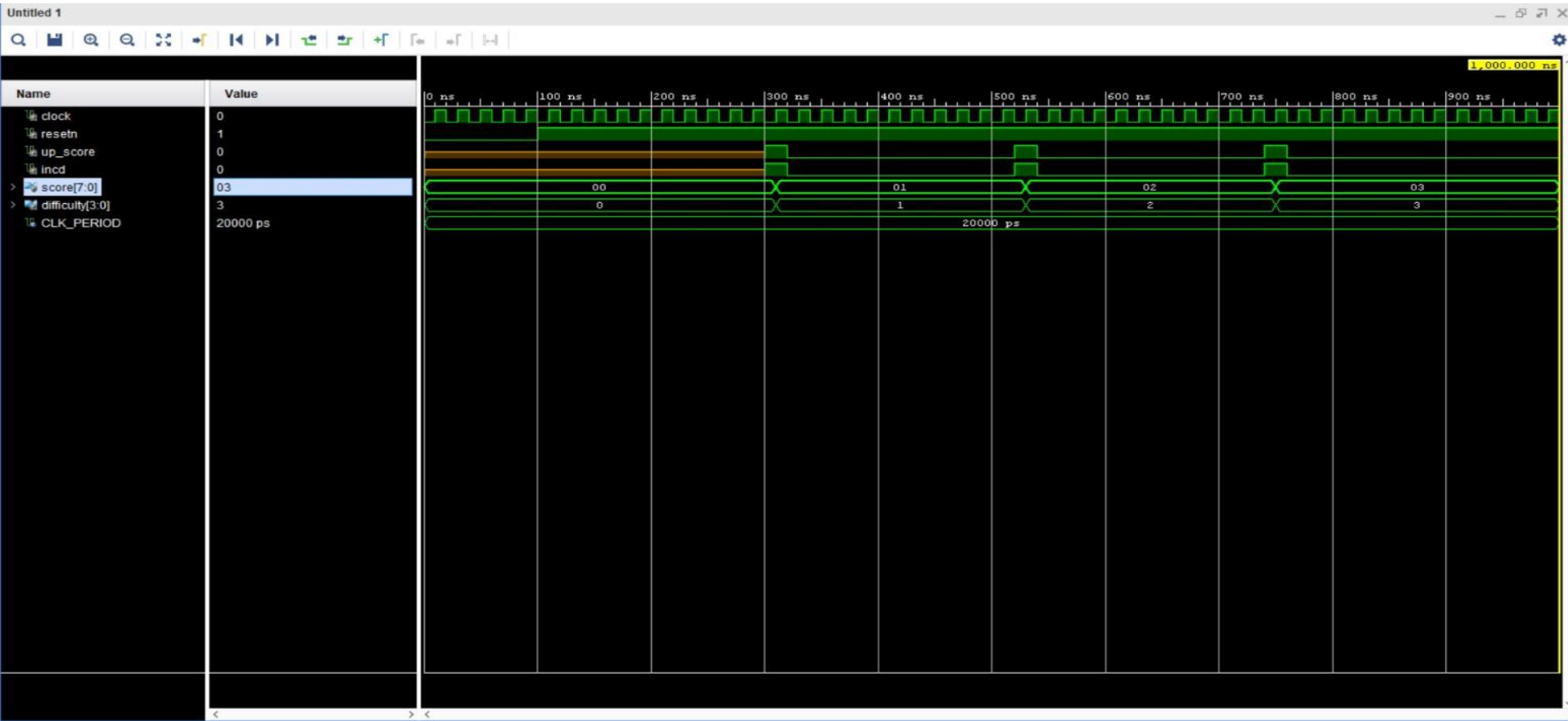
Game Controller Simulation



Bars Timing Simulation



Score Simulation





Difficulties

- Accurate hit Detection
- Ball movement
- resetting the ball and the match



Demo Time



Improvements

- Start Menu
- Single Player mode
- Display scoring on display
- Sound
- External gamepad
- Background picture
- Display a message/banner that tells the user he won the game or lost the game