CONNECT FOUR

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Goals

CREATE A WORKING CONNECT FOUR GAME BOARD USING VGA

DISPLAY WINNER & TOTAL NUMBER OF WINS

IMPLEMENT GAME WITH CONTROLLER

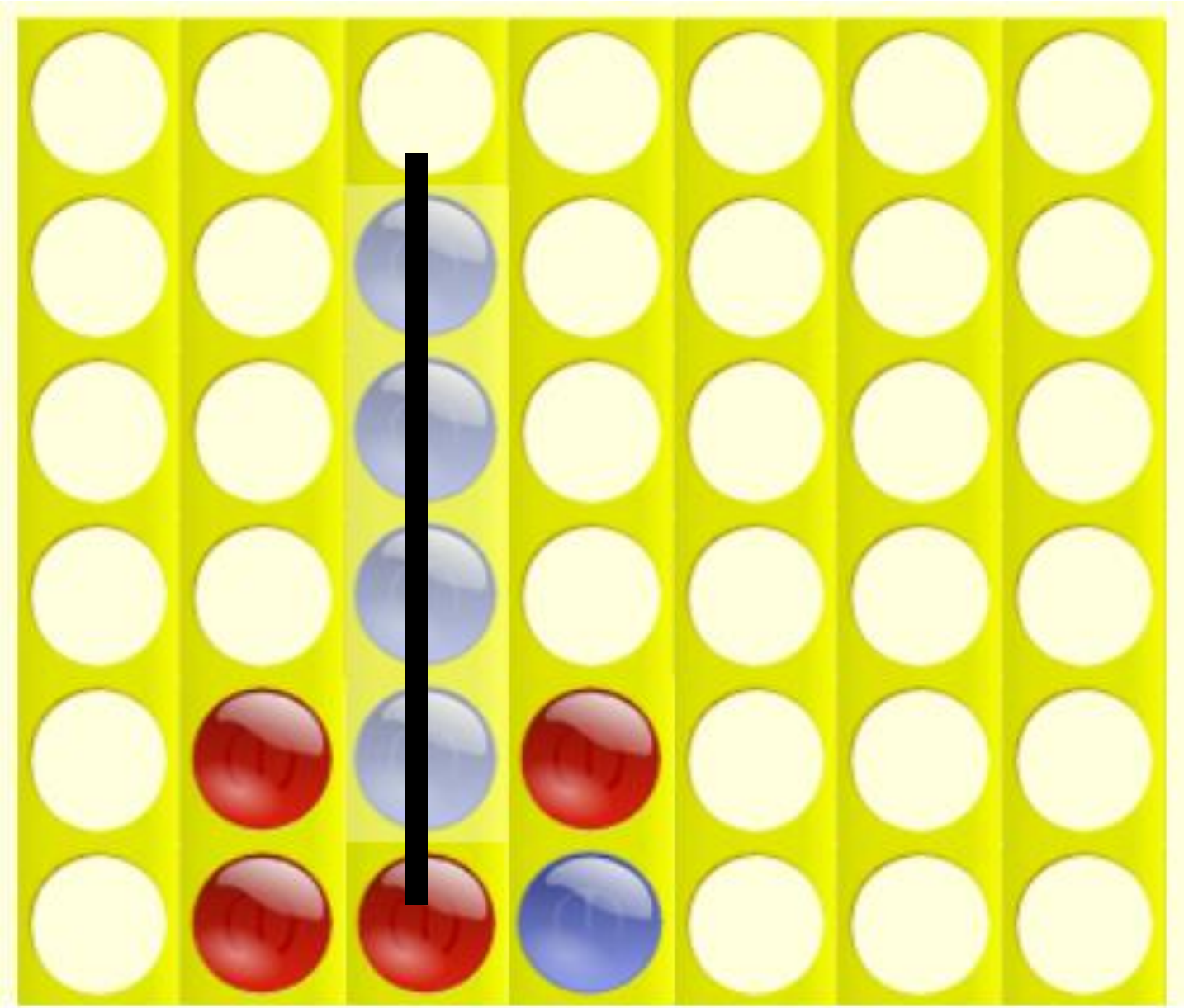
How To Play!

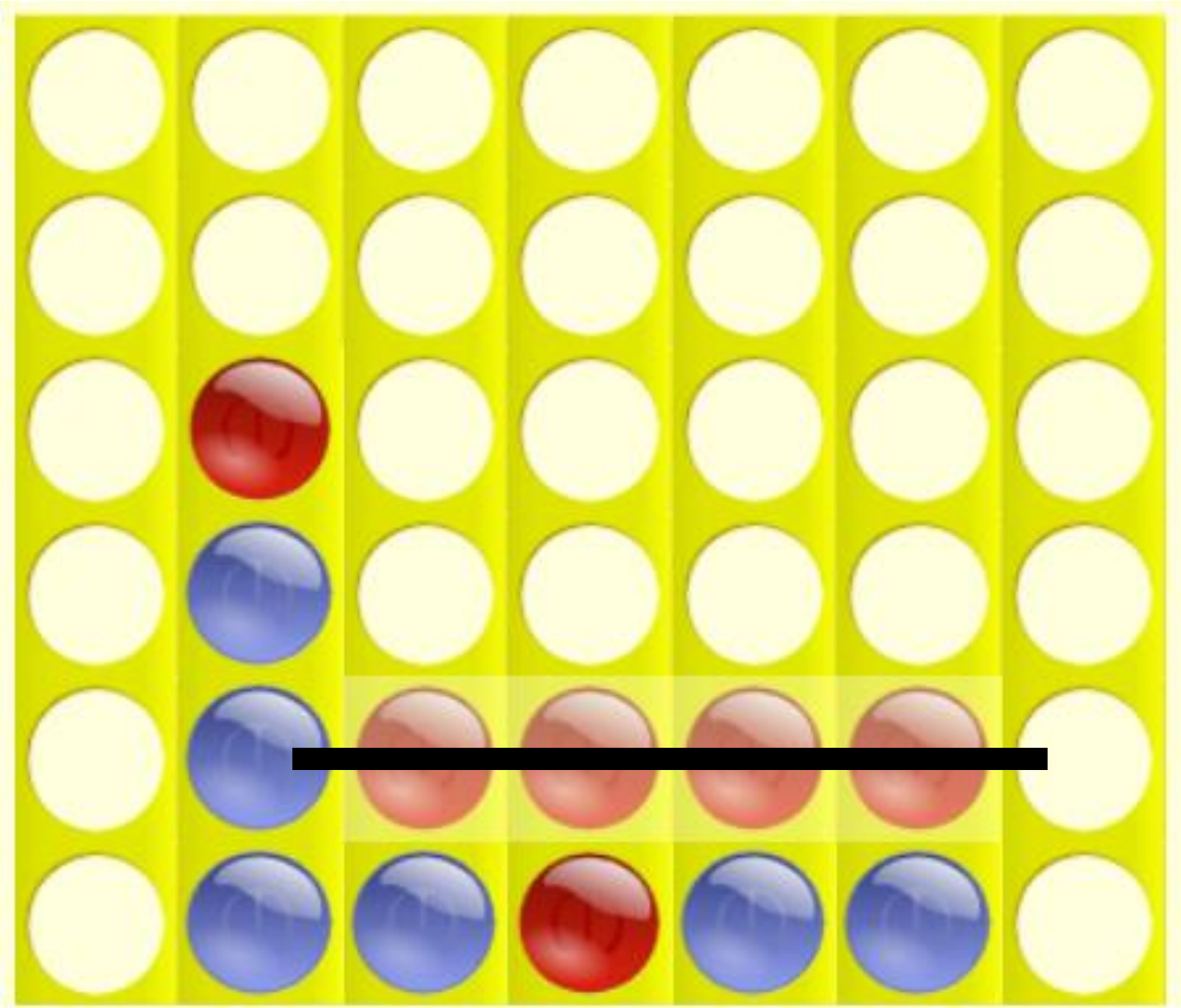
Turn Based Game

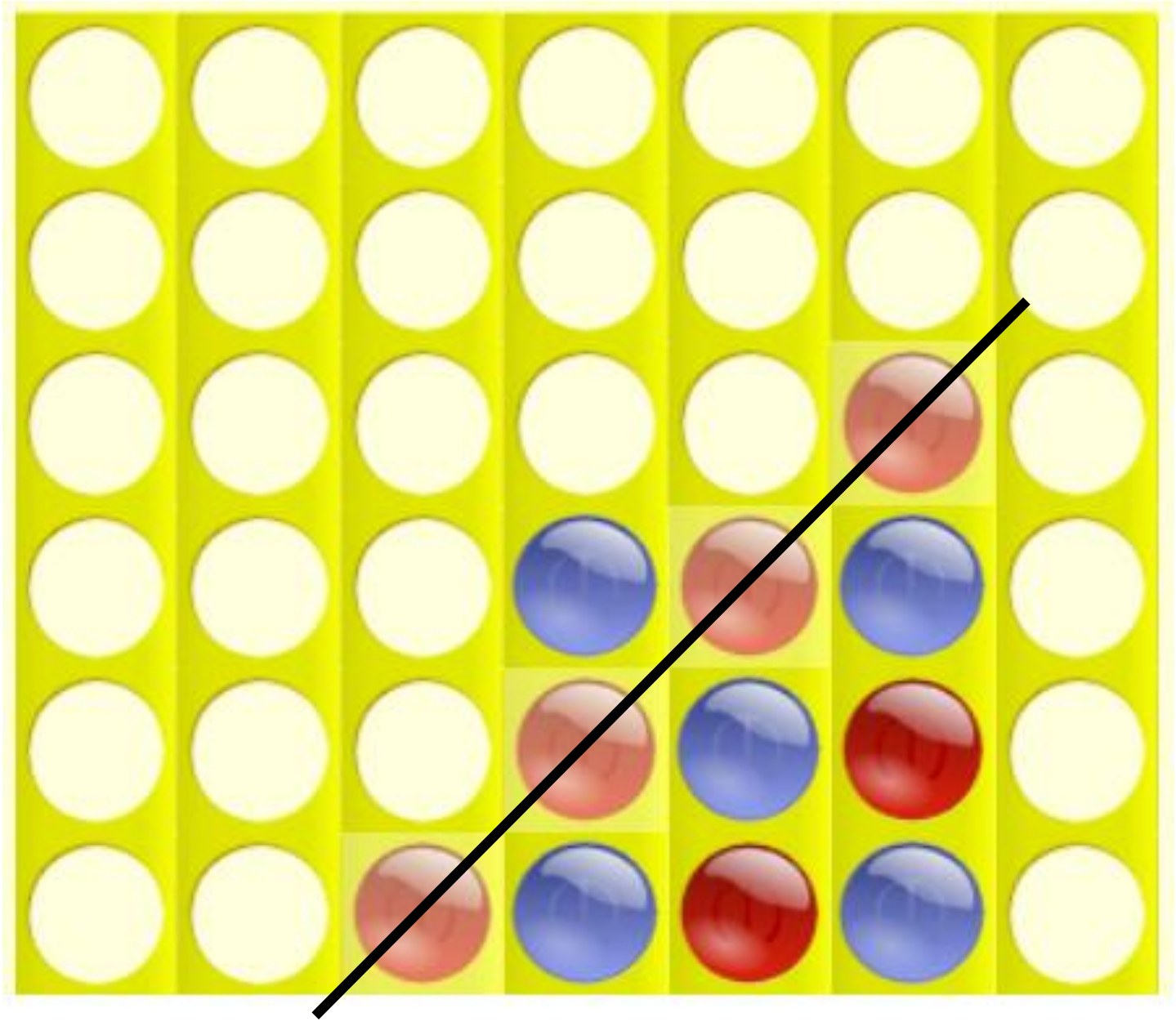
Choose where you want to Drop your Game Piece

First Person to get at Least Four in a Row Wins!

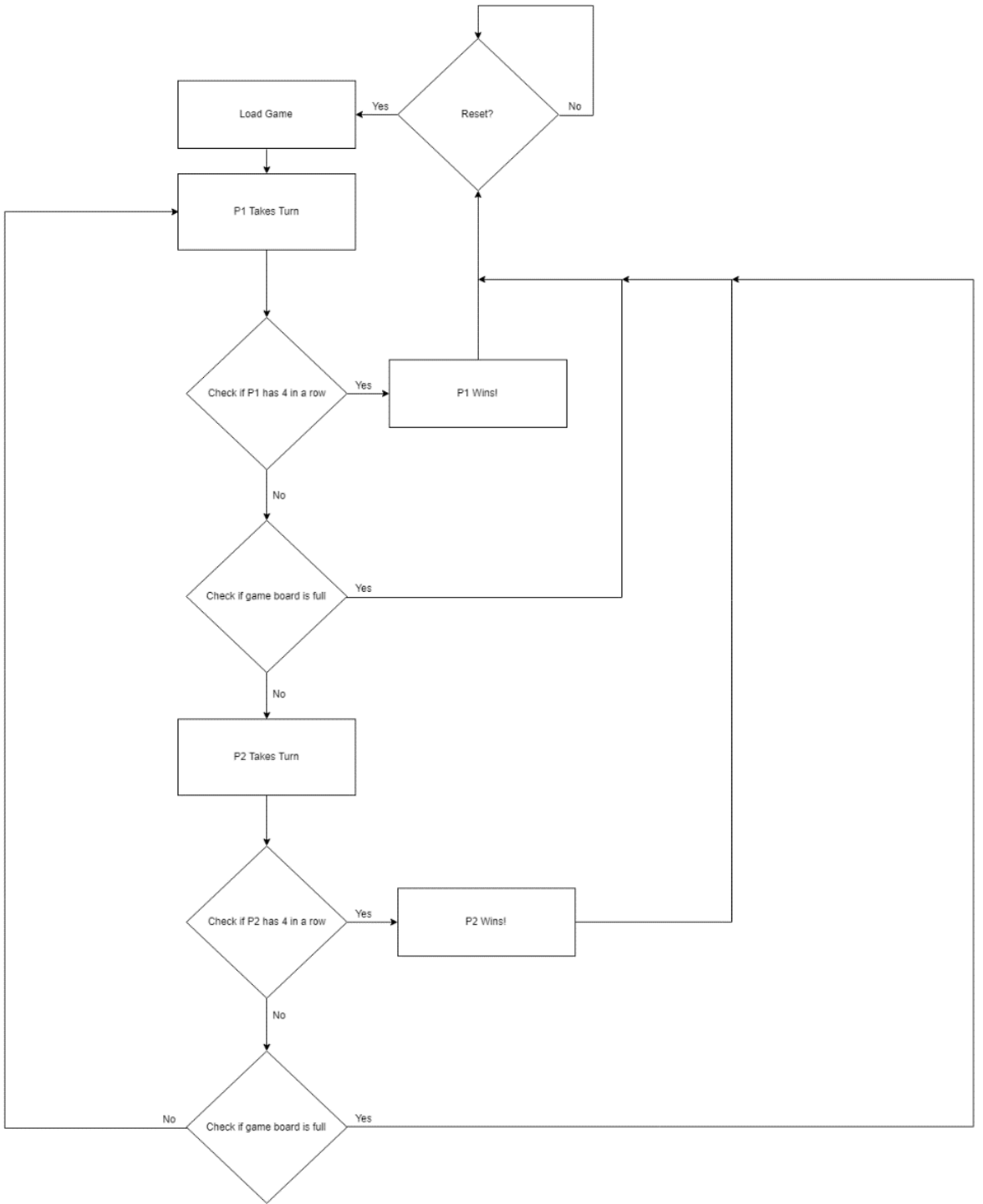
If the Board Fills up Before Anyone Wins, this Results in a Tie

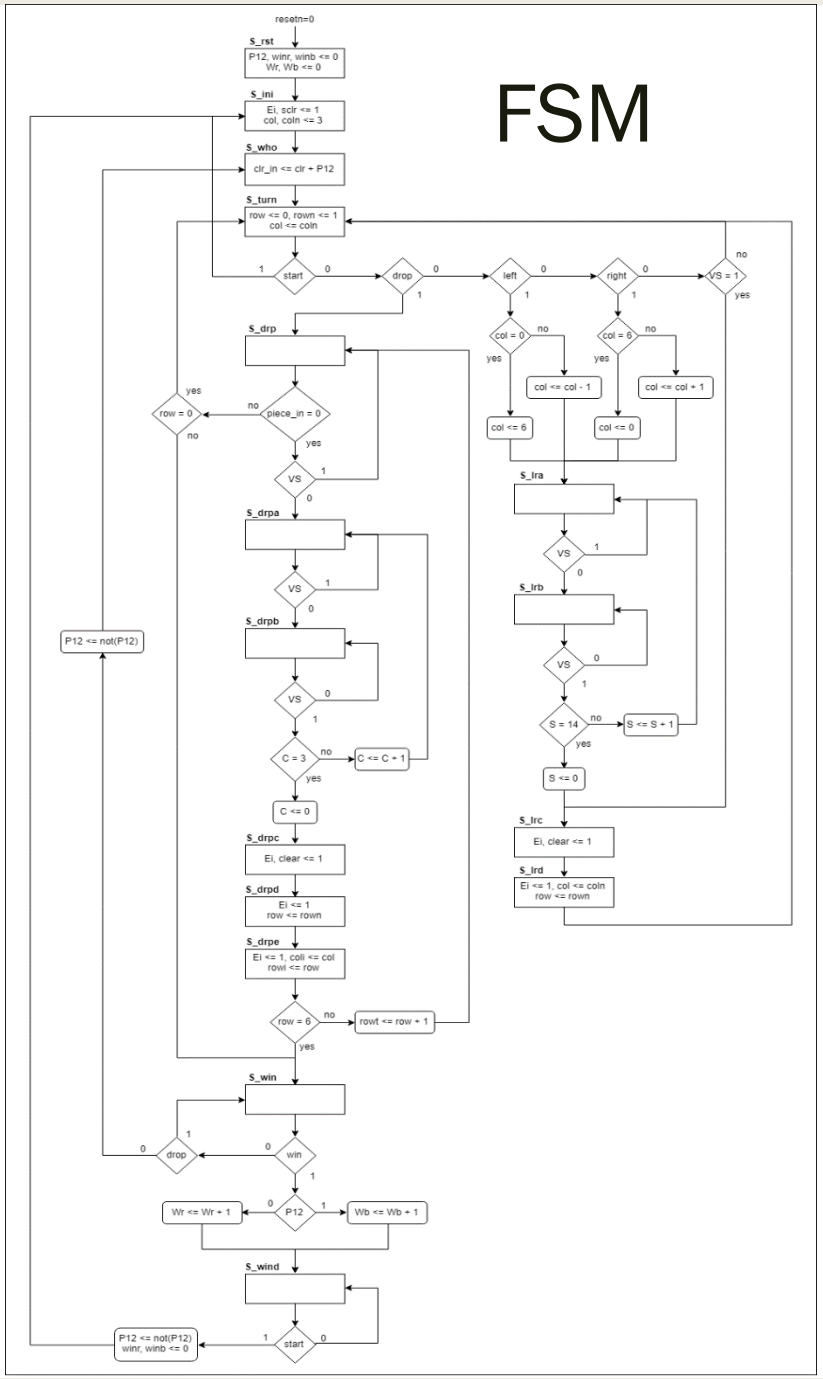




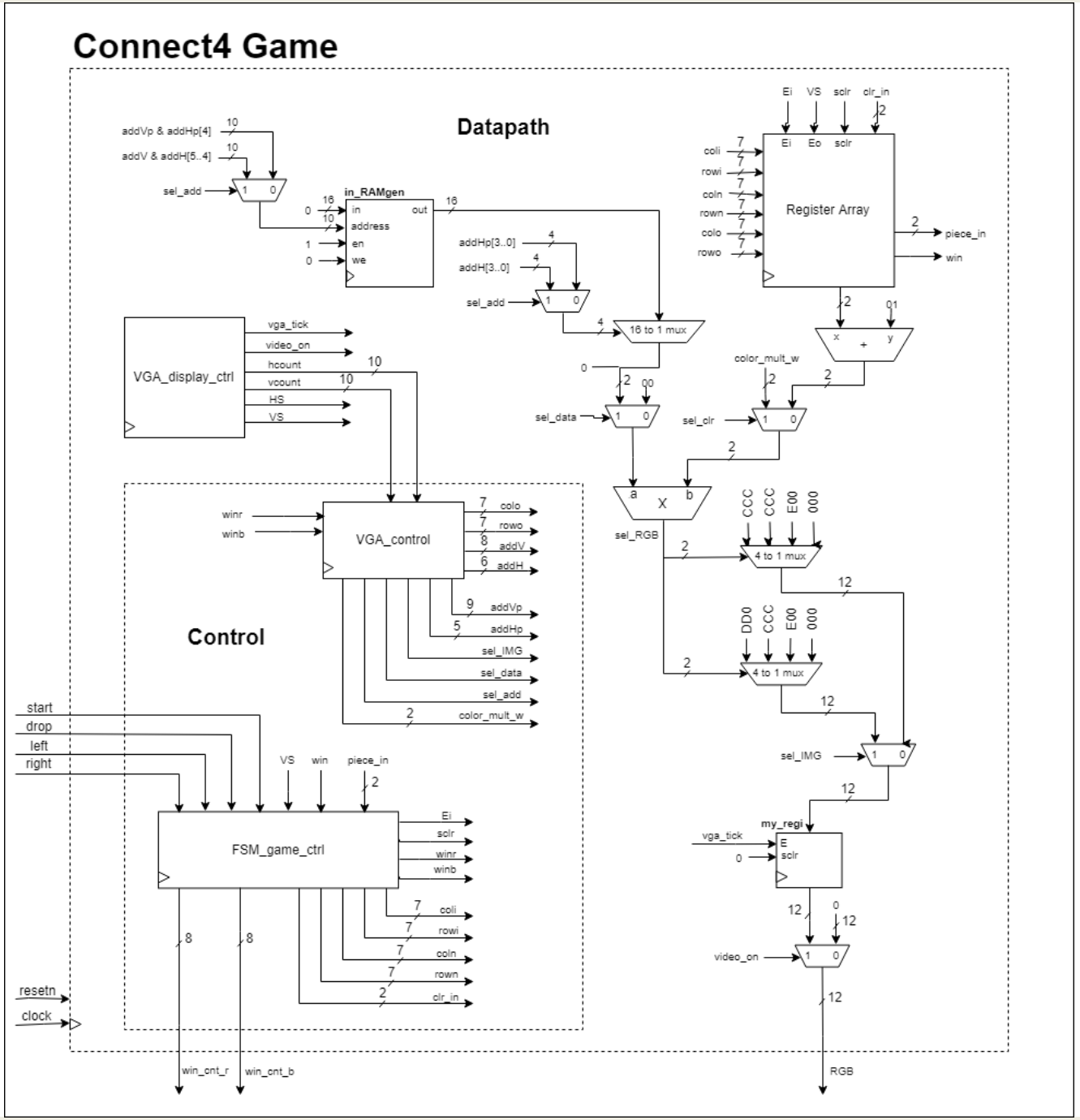


BLOCK DIAGRAM

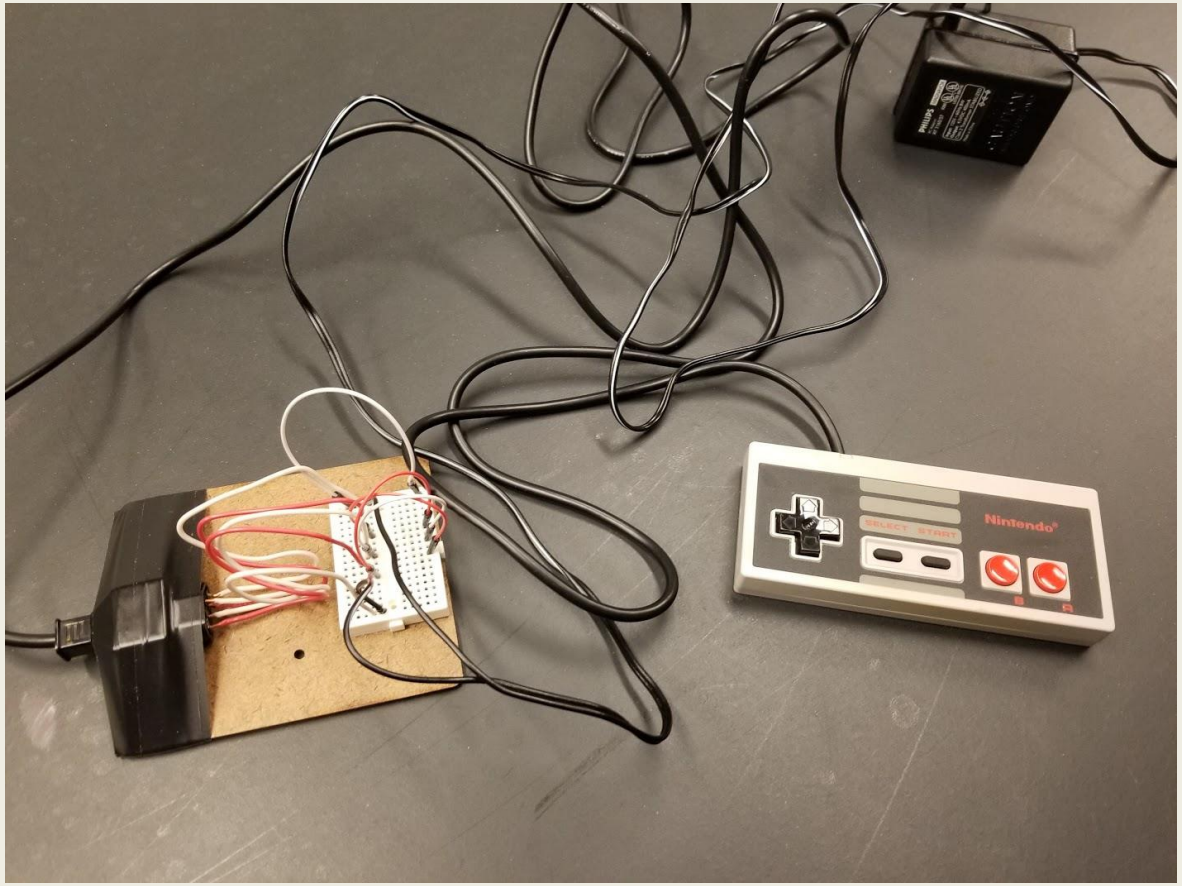


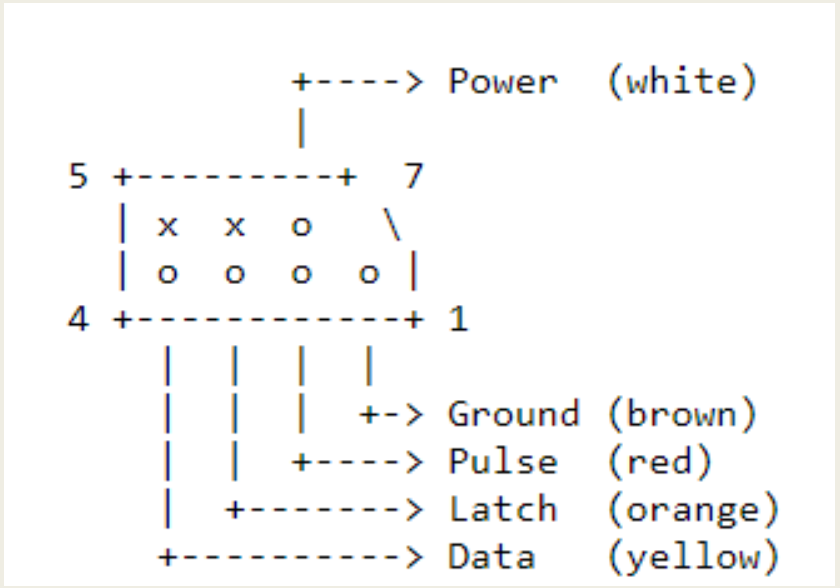

FSM
resetn=0
S_rst
P12, winr, winb <= 0
Wr, Wb <= 0
S_ini
Ei, sclr <= 1
col, coln <= 3
S_who
clr_in <= clr + P12
S_turn
row <= 0, rown <= 1
col <= coln
start
drop
left
right
VS = 1
S_drp
row = 0
piece_in = 0
VS
S_drpa
S_drpb
P12 <= not(P12)
C = 3
C <= C + 1
C <= 0
S_drpc
Ei, clear <= 1
S_drpd
Ei <= 1
row <= rown
S_drpe
Ei <= 1, coli <= col
rowi <= row
row = 6
rowt <= row + 1
S_win
drop
win
Wr <= Wr + 1
P12
Wb <= Wb + 1
S_wind
P12 <= not(P12)
winr, winb <= 0
col = 0
col = 6
col <= col - 1
col <= col + 1
col <= 6
col <= 0
S_lra
S_lrb
S = 14
S <= S + 1
S <= 0
S_lrc
Ei, clear <= 1
S_lrd
Ei <= 1, col <= coln
row <= rown

Connect4 Game

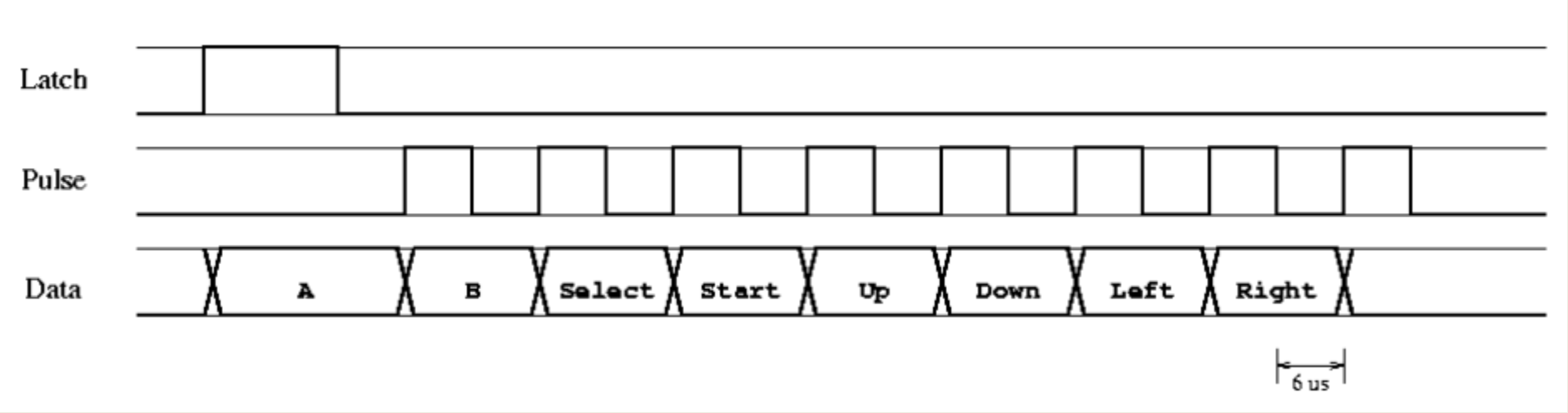


NES Controller

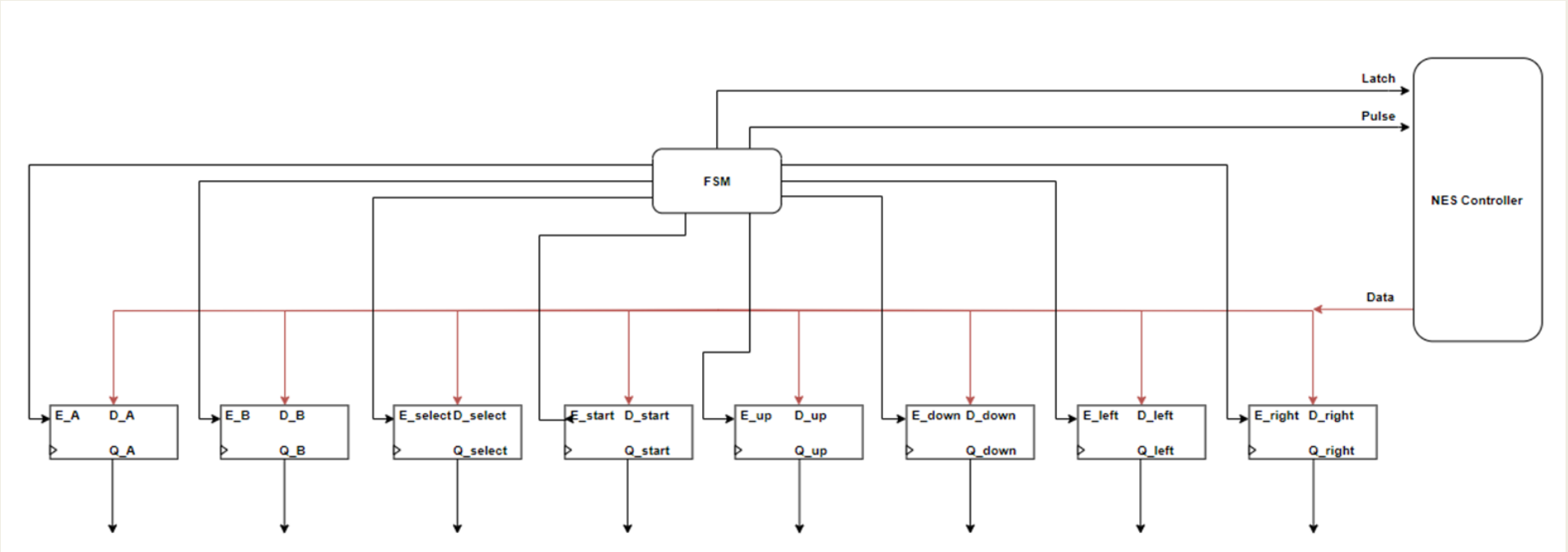




NES Controller - Timing Diagram

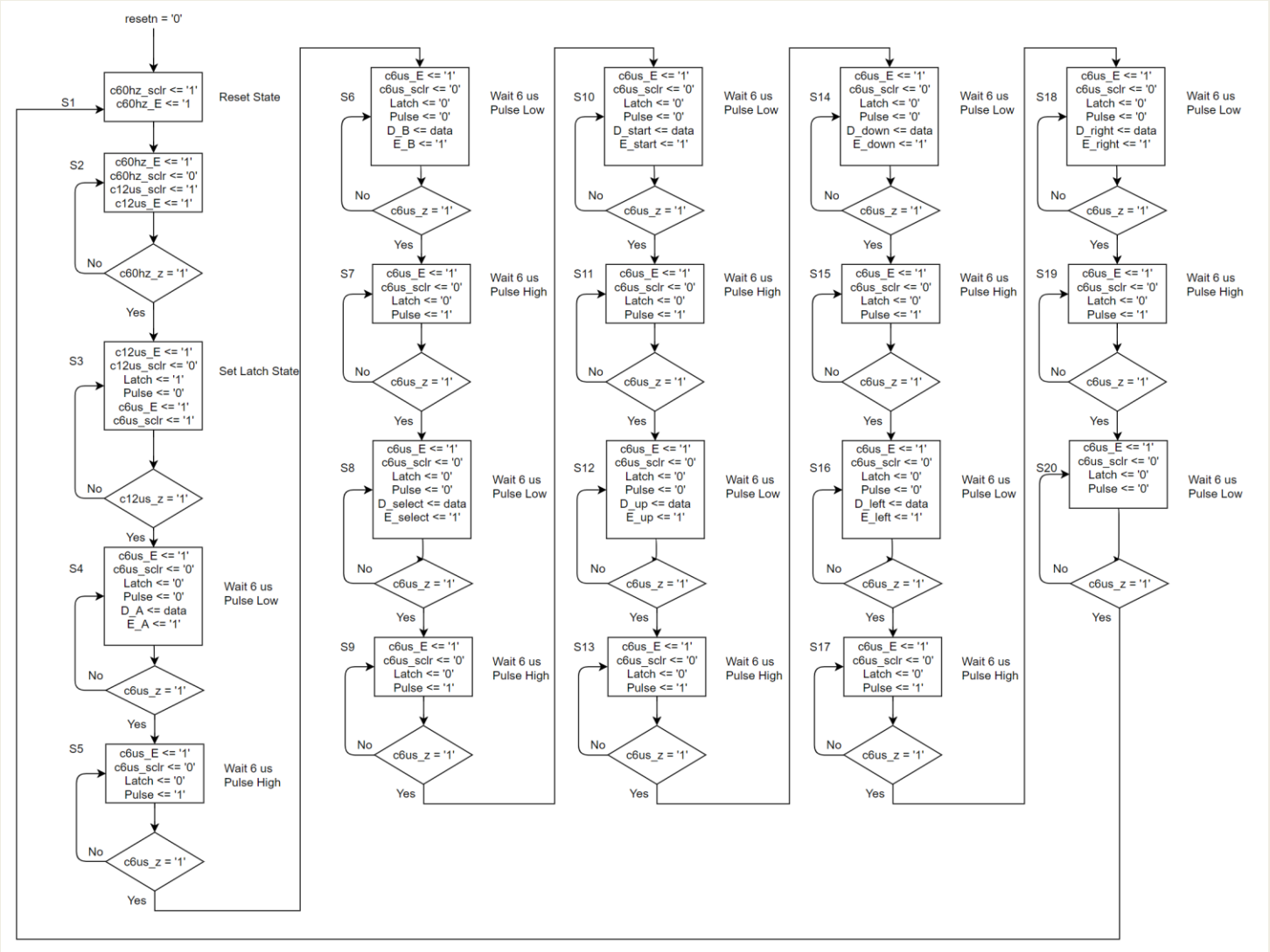


- Latch freezes state of the buttons on the controller
- Data is shifted out of the controller 1 bit at a time with 8 pulses



NES CONTROLLER - DATAPATH

Registers to hold button press inputs



NES Controller - Control

- State Machine with embedded “my_genpulse_sclr” Counters
- 60hz Counter
  - *COUNT = 1666666*
- 12us Counter
  - *COUNT = 1200*
- 6us Counter
  - *COUNT = 600*

Future Improvements

INCLUDING SOUND EFFECTS

ADD MORE GAMES

IMPLEMENT A SECOND CONTROLLER

THE END

QUESTIONS?

Please Ask Us!