

University of California at Berkeley
College of Engineering
Department of Electrical Engineering and Computer Science

EECS150, Spring 2010

Quiz 4: February 19th

You are stranded on a desert island with nothing but a power supply (that gives you a V_{dd} and ground), a box of n-type and p-type transistors (the box has an unlimited amount of each transistor type), and wires. While walking down the beach you discover a broken radio. This radio is missing an important component whose output selectively oscillates based on an input signal. Fortunately, you just happen to have the Verilog for a circuit that performs exactly this function:

```
module RadioController(  
    input    clk,  
    input    in,  
    output   out  
);  
  
localparam S0 = 1'b0,  
           S1 = 1'b1;  
  
reg cs, ns;  
  
assign out = cs;  
  
always @(posedge clk) begin  
    cs <= ns;  
end  
  
always@( * ) begin  
    ns = cs;  
    case (cs)  
        S0 : begin  
            ns = S1;  
        end  
        S1 : begin  
            if (in) ns = S0;  
        end  
        default : ;  
    endcase  
end  
  
endmodule
```

Unfortunately, you don't have CAD tools and need to implement the circuit by hand! Using only the transistors, wires, and power available to you on the island, implement this circuit in the space given below. *Hint:* Use hierarchy in your design. (This will help you draw it and us grade it).