# Last Homework

1. Show how to make a JK flip-flop from a type D flip-flop and a 4-input multiplexer. Hint: use the address inputs for J and K.
2. Design a reaction timer. "A" pushes his button; and LED goes on, and a counter begins counting. When "B" pushes her button, the light goes out and an LED display reads the time in milliseconds. Be sure to design the circuit so that it will function properly even in A's button is still held down when B's button is pushed. Steal liberally from the counter and display you actually built in lab.
3. The HCT138 is a "1-of-8 decoder": given a 3-bit address, it lights up one of 8 outputs with a logic level. It also has some enables to control how and when the outputs are set (check the datasheet linked above for details). Using nine of these things, can you make a "1-of-64 decoder"? Hint: use one of them as an enabling switchyard for the others.
4. Design a "simple" encoder: a circuit that outputs the (2-bit) address telling which of four inputs is HIGH (all other inputs must be LOW).