CS 210 Homework 8

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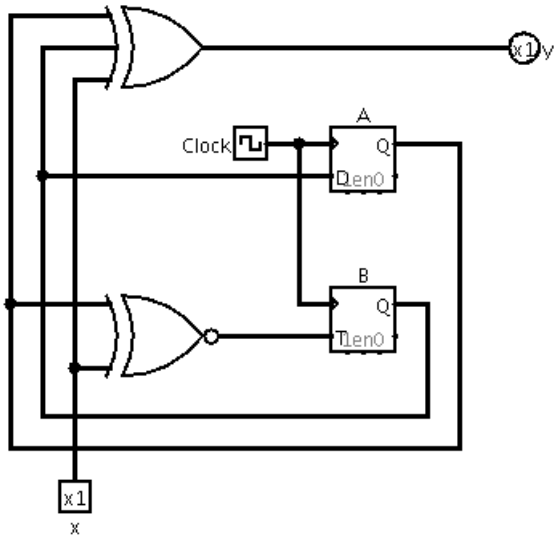
Due: Wednesday, May 30, 2012

1. Analyze the following sequential circuit using the steps from page 52 of the notes. Make sure to clearly label your steps as in the example on page 53 of the notes. Provide **both** a state table and a state diagram.



Note: The "A" flip-flop (on the top of the diagram) is a D flip-flop, while the "B" flip-flop (on the bottom) is a T flip-flop.

2. Using JK flip-flops, construct a 2-bit up-down counter that takes two inputs: the enable input (E) and a mode select input (M).

$$E = \begin{cases} 1 & \text{enable incrementing/decrementing} \\ 0 & \text{disable incrementing/decrementing} \end{cases}$$

$$M = \begin{cases} 1 & \text{state is incremented (if enabled)} \\ 0 & \text{state is decremented (if enabled)} \end{cases}$$

Follow the steps from page 57 of the notes, and clearly label your steps as in the example on page 58 of the notes. In Logisim, make sure your circuit diagram from step 6 works by simulating with a clock at a frequency of 1Hz.