

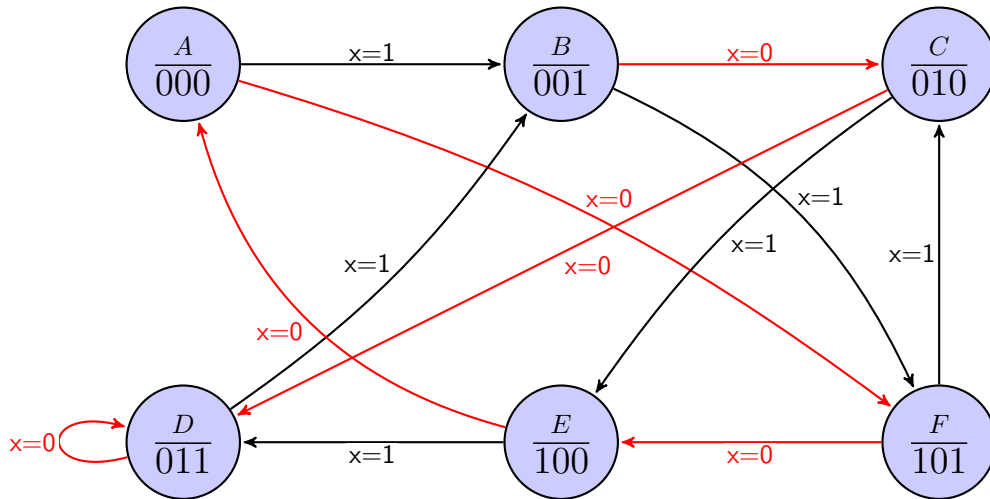
**CSCI 210**  
**HOMEWORK ASSIGNMENT 05**

ONE HOT ENCODING

---

DESCRIPTION

Using a one-hot encoding, you will design, starting from state-diagram, to equations, to implementation in Quartus II a circuit that works as follows. Here is the state transition diagram.



Use KEY[3] as a reset that will send you back to state A when pressed and KEY[0] should be connected to the clock. There is one input variable  $x$  which should be connected to SW[0]. Each D-flip-flop (states A..F) should be attached to LEDR[0..5] so it is obvious which state the machine is in. The outputs should be displayed on HEX[0..2].

PART 1: (DESIGN CIRCUIT)

Write a state table which completely describes the behavior of this device. Derive the correct equations for the D-flip-flops. Write these neatly and cleanly for turning in. The state table and equations will be due in class on Friday prior to the program submission.

PART 2: (IMPLEMENT IN QUARTUS)

Using Quartus, implement the system using the equations derived in Part 1. Compile and deploy to DE0 board. Verify the design and the implementation actually works by toggling through all possible input combinations.

SUBMISSION: (NO LATE WORK ACCEPTED)

Prior to the due date and time posted in Moodle, upload your project into Moodle. This will be a zip file which contains the entire project directory structure. Your submission should be named userid-210-HW05.zip, where userid is your userid. Make sure to check two things after submitting your assignment:

- (1) Your file has successfully been uploaded into Moodle.
- (2) Download your file from Moodle, unpack the file, load and execute it on your board. If this doesn't work for me, you will lose significant credit on the assignment.