

Lab #6

EC262

PRE-LAB

For the following circuit with one input (y) and one output (z),

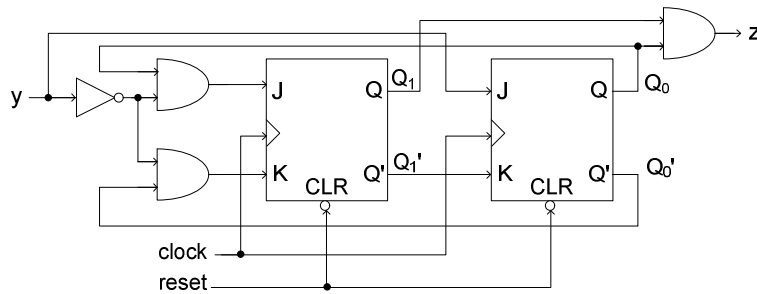
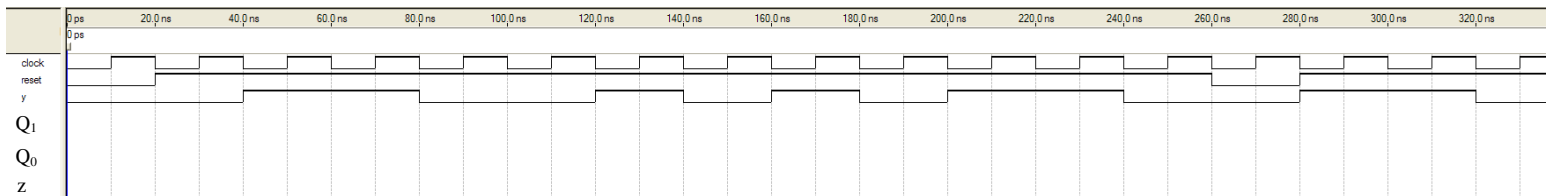


Fig. 1. Circuit for lab 6

1. Find a state table.
2. Find a state diagram.
3. Complete the timing diagram below.



4. What is the function of this circuit?

LAB

In this lab, you will implement the circuit shown in Fig. 1 on a DE2 board.

1. Create a new project and implement the circuit shown in Fig. 1. Use the necessary components (AND, NOT, JKFF) from the Quartus library.
2. Compile, simulate and verify the circuit.
3. Modify your design to display the output z on a 7-segment display (0 or 1). Demonstrate this lab to your instructor.

Requirements:

- a. Use *KEY0* for the *reset* signal.
- b. Use *SW0* for the *y* signal.
- c. Use *KEY3* for *clock* signal (manual).
- d. Use *HEX0* for the output 7-segment display.

Note:

- For the pushbutton keys (*KEY0* and *KEY3*): **up=high (1)** and **down=low (0)**
- You can generate a clock signal by pushing down *KEY3* (trailing edge) and releasing *KEY3* (leading edge).