16.12.2016

Istanbul Technical University
Department of Computer Engineering

BLG 231E - Digital Circuits
Assignment 5

Due Date: 22.12.2016, **Thursday,** 17.00.

- Please **write neatly**.
- If you are not preparing your homework in a computer, please show complement of a symbol by putting a **dash** over the symbol (e.g. do not use *x'* use $\bar{x}$).
- **Consequences of plagiarism:** Disciplinary regulations of The Council of Higher Education and of the university are applied.
- **No late submissions** will be accepted.

Submissions:

➢ Please submit your solutions on a paper to the Digital Circuits Course Assignment Box at the department secretary's office

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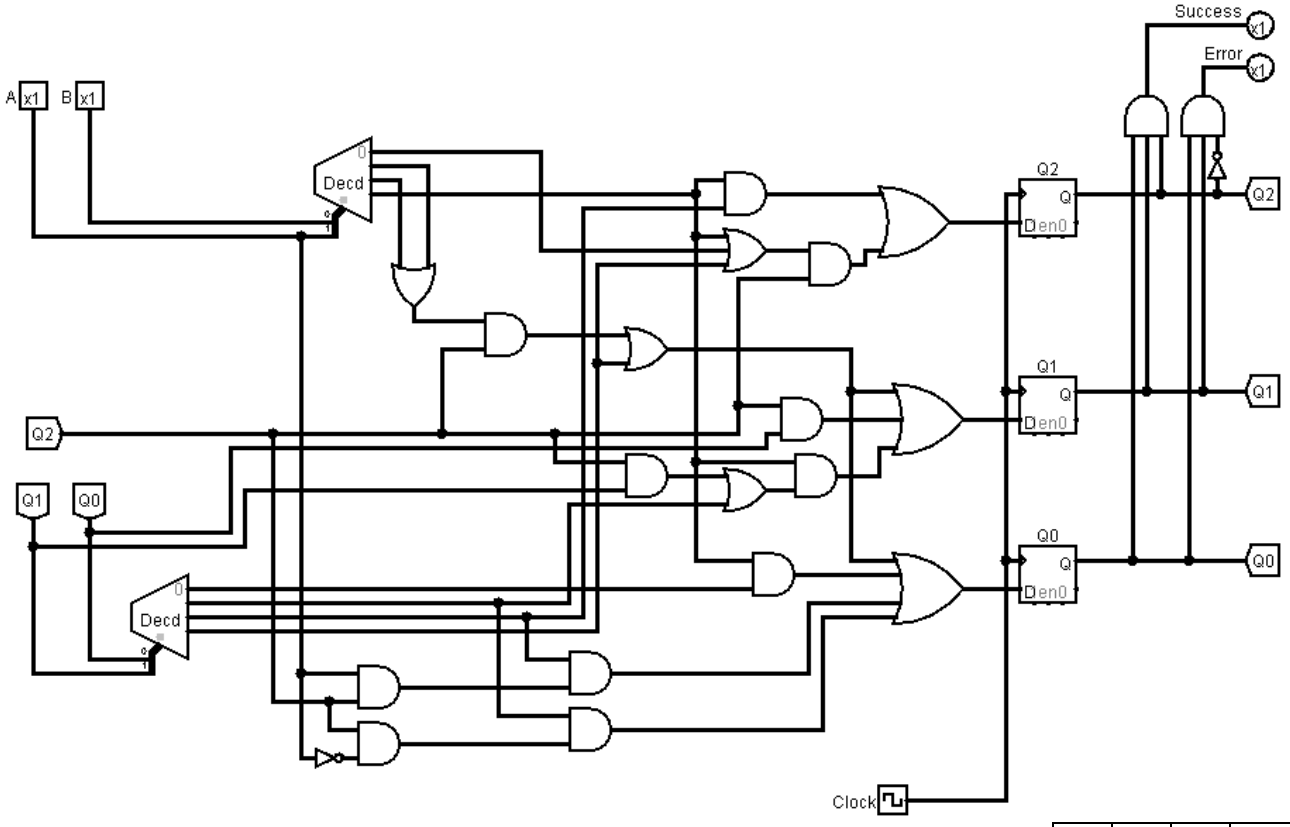
A sequential circuit with 2 inputs (**A**, **B)** and 2 outputs (**Success**, **Error**) is given below. Additionaly, **circ** (logisim) file which contains the given design is accessible through Ninova.



Q_2	Q_1	Q_0	State
0	0	0	X
0	0	1	Y
0	1	0	Z
0	1	1	E
1	0	0	K
1	0	1	L
1	1	0	M
1	1	1	S

a) Analyze the given circuit. Write all necessary expressions, draw the state transition table and the state transition diagram (STD) of the circuit.
Use the given table on the right for names of the states in your STD.

b) There are two different input sequences given below. Assume that the initial state of the circuit is **state X** (*000*) for both sequences, and determine the state transitions and outputs for each input sequence, separately.

i. **A**: 0111 1011 0011 10
   B: 1011 1011 0011 10

ii. **A**: 1111 1001 0111 10
   B: 1011 1011 0110 10