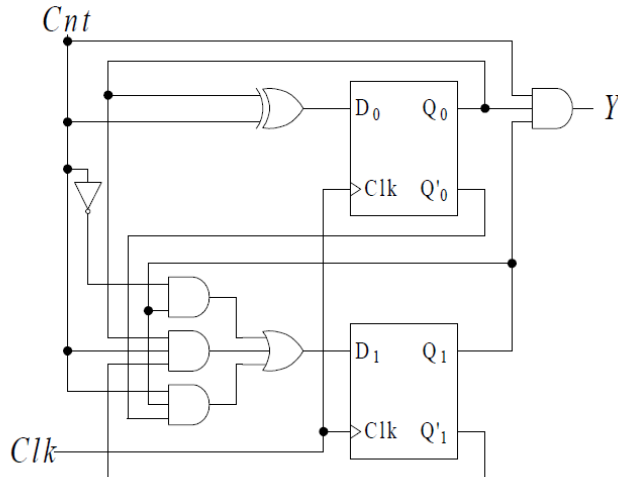# EHB205E Introduction to Logic Design
Homework 4
Deadline: 21/01/2022 (submit using Ninova before 9:30)

1. **SEQUENTIAL CIRUITS: CITCUITS TO STATES**
   Consider a sequential circuit with an input *Cnt* and an output *Y*, shown below.

   a) Obtain **state diagrams** and **state tables** of the circuit.
   b) Determine whether this circuit is **Mealy** or **Moore** machine.
   c) Implement the diagram or table found in a), using positive edge triggered S-R flip-flops.

2. **SEQUENTIAL CIRUITS: STATES TO CIRCUITS**
   Consider a state diagram shown below. Implement this state diagram using T (toggle) flip-flops and AND gates. What is the purpose of the circuit?
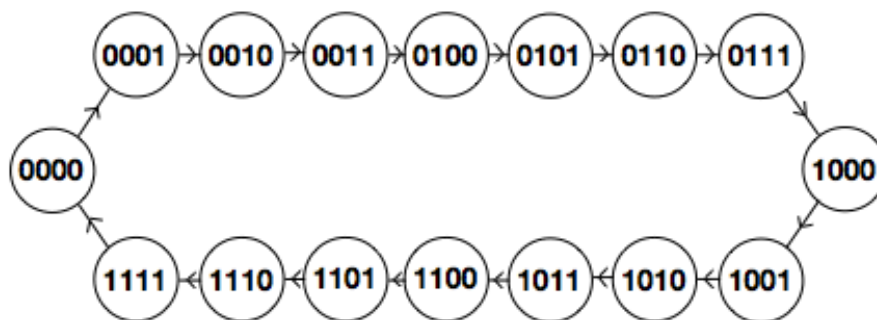
3. **STATE MACHINE SYNTHESIS**
   Design a counter with a control input. When the input is high, the counter should sequence through three states: 10, 01, 11 and repeat. When the input is low the counter should sequence through the same states in the opposite order 11, 01, 10 and repeat.
   a) Draw the state diagram and state transition table.
   b) Implement the counter using D flip-flops and gates.

Grading: 1) 40% 2)30%   3)30%
Note: *Return through Ninova.*