University of New Brunswick

Computer Science

CS3853: Computer Architecture and Organization

Instructor: Joannah Nanjekye, jnanjeky@unb.ca
Due Date: August 07, 2024 —- 11:59 PM

ASSIGNMENT 3

Submission instructions:

- Submit a pdf file to the Desire2Learn dropbox

Problem 1. Consult the class notes (slides) and discussion on flip-flops to implement the following. In each case use any additional logic gates that are required.

- A T-FF using a D-FF
- A JK-FF using a T-FF
- A D-FF from a JK-FF
- A JK-FF using a D-FF

Problem 2. Design a synchronous counter using D-FFs and one input x. If x = 0 it counts 1,2,3, 0, 1,2 . . .; if x = 1 it counts 1, 3, 0, 1, 3, ... Assume that x only changes in 1 or 3 (in which case there is one combination that will never occur – state 2 and x = 1).