CSE 436/536

Digital Integrated Circuits

Final Project – VLSI Design of Sequential Square Root

Demo Date 14/01/2022 18:00

1. In this assignment, using Magic Layout Tool you will design a 0.25um TSMC process standard cell for D flip flop.

2. Design a sequential circuit that can find square root of a number **N**. **N** is a 8-bit number.

   Your circuit will try all integers until half of **N**. When the resultant square becomes higher than N it selects the last number as the result.

   For instance let's assume **N** is 53, then your circuit tries all numbers from 1 to 53/2 = 26. When it tries 8, the result is 64 which is greater than 53 so the result is 7.

   - ✓ First draw the state diagram. Try to draw the simplest diagram for that. Because it eases your design.

   - ✓ Then draw the state table and draw the schematic of your design on Logisim. Make sure it works in Logisim.

   - ✓ **Draw your layout on Magic tool using the standard cells you designed. You have to use hierarchy.**

   - ✓ **Convert your design to Spice and show the functional accuracy of your design and the delay of your circuit for N = 255.**

   - ✓ Put your State Diagram, State Table, Logisim circuit, Magic layouts, your Spice extracted circuit deck and Spice results into a zip file. Name your zip file as:

   StudentName_StudentSurname_StudentId_FinalProject.zip