**Lab 7 Digital Circuit Design Using Behavioral Modeling**

**Objective**

In this project, we will learn how to use the behavioral modeling approach to realize digital circuit design. Two digital circuit will be designed using two different procedural statement.

**Circuit 1: using always and case procedural statement**

In previous project, you implemented 7-segment LED display circuit using structural or dataflow modeling approaches. In this project, you need to use behavioral modeling approach to do it.

**Circuit 2: using always and if …else … procedural statement**

The circuit has 4-bit input A[3:0] and 4-bit output F[3:0]. There is also a control bit C. If C=1, then F equals 1’s complement of A (flip each bit of A to get F); If C=0, then output F equals A are the same. Please use **always** and **if…else…** statement to achieve the design.

**Assignment:**

Develop Verilog code to implement each circuit. Using Basys3 board for design validation

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On Basys3 board, component 3 is 16-slide switches, component 6 is 16-LEDs. You can select slide switches to set input signals, and use LEDs for output displaying. Comparing the hardware outputs and simulation results for validation.

**Assignment 4:**

Submit the project report.

The project report format:

1. Objective
2. Circuit design method and debug description
3. Source code
4. Simulation waveforms.
5. Conclusions.