Lab 4
Carry-Lookahead Adder and Multiplier

Objectives

- To get familiar with the Xilinx Schematic Editor Tool.
- To get familiar with the Xilinx Simulation Tool.
- To design and implement simple combinational logic circuits using the Schematic Editor and Simulator.
- To download your circuits onto the prototyping board and test it.

Laboratory Instructions

- Create a directory with your name on the C drive of your lab PC. Use this directory to create your project, store your results, bitstreams, etc. during the lab session.
- You can bring complete project files on a floppy disk and then use the **Copy Project** command from the Project Manager menu to copy it into the directory you created above.
- Alternatively, you can create a new project in your directory on the C drive and then copy your files to that new project directory. Remember to **Add** your .SCH file to the project.
- Perform functional simulation of your design and have it checked by your TA.
- Refer to appendix A for instructions on performing functional simulation.
- Refer to appendix B for instructions on how to download the circuit to the prototyping board.
- Test and demonstrate your circuit to your TA.
- Before you leave the lab please **remove** the files and directories that you created on your lab PC and leave our workplace clean and tidy.

Design Problems

Using the Xilinx Schematic Editor and Simulation Tools, design, simulate, and demonstrate on the prototyping board the following circuits:

1. Implement a 4-bit Carry-Lookahead adder as shown in Figure 3-29 on page 130 in Ref. [1].

2. Using a hierarchical design method, implement the 4-bit by 3-bit binary multiplier as shown in Figure 3-34 on page 145 in Ref. [1].

3. Design and implement a 4-bit incrementor.

[1] M. M. Mano and C. R. Kime, "Logic and Computer Design Fundamentals," 2nd Edition