

Week 2 Design Exercises

Design Exercise 2-1: 2-bit Adder

a. Design a circuit with standard 2-port logic gates (NAND, NOR, AND, OR, XOR, XNOR, NOT) which adds two 2-bit numbers. The circuit will have 4 input wires. How many output wires are required?

b. Create a schematic design project in Quartus II which adds two 2-bit numbers. Simulate the circuit to make sure that it works.

Design Exercise 2-2: 8-bit Adder

Construct a Quartus II project which adds two 8-bit numbers using a Verilog program. Simulate the circuit to make sure that it works.

Design Exercise 2-3: Digital multiplication

a. Design a circuit with standard 2-port logic gates (NAND, NOR, AND, OR, XOR, XNOR, NOT) which multiplies two 2-bit numbers. The circuit should have 4 input wires. How many output wires are required?

b. Construct a Quartus II project which multiplies two 8-bit numbers using a Verilog program. Simulate the circuit to verify that it works.