EL203 Embedded Hardware Design

LAB_4

Aim: To perform different Tasks using Verilog HDL.

1. To design ALU using RTL and behavioral model. The input bits are of 4 bits. The ALU performs the following tasks:

   - Arithmetic operations (addition, subtraction)
   - Comparator operations (less than, equal to)
   - Shifting operations (shift left, shift right)
   - Bitwise operations (NAND and NOR logic)

   Write test bench to check the functionality of ALU.

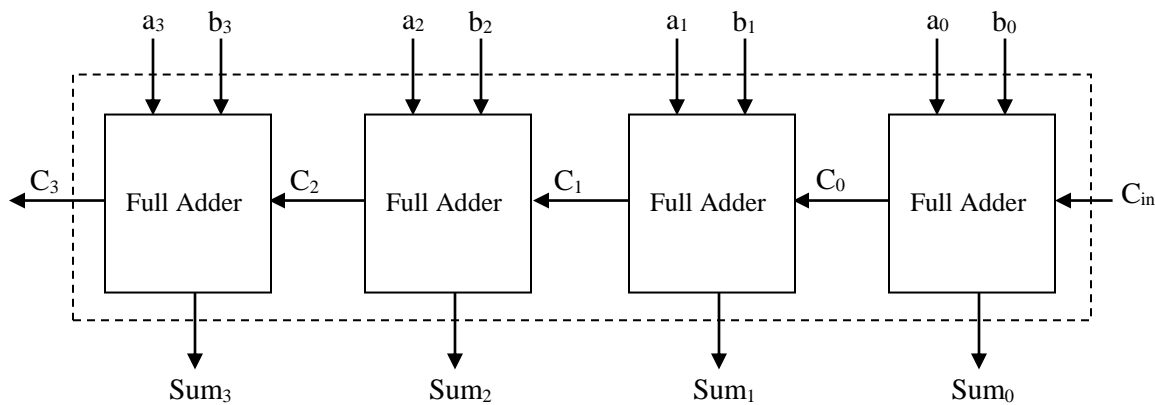2. Design a 4–bit ripple carry adder in Verilog HDL. The module structure is as shown in Figure 1.

Figure 1: 4–bit ripple carry adder.

3. Design 2–input 4–bit BCD adder in Verilog HDL. Use 4–bit ripple carry adder as instance model for adder circuit in BCD adder.