



Assignment no 06:

Chapter 5: Digital Building Blocks

Note: You can check the exercises after the Chapter. In our assignment, we are using the 2nd Edition of “Digital Design and Computer Architecture” By David and Sarah Harris.

Exercise 5.14 Design 4-bit left and right rotators. Sketch a schematic of your design.

Exercise 5.15 Design an 8-bit left shifter using only 24 2:1 multiplexers. The shifter accepts an 8-bit input A and a 3-bit shift amount, $shamt_2:0$. It produces an 8-bit output Y. Sketch the schematic.

Exercise 5.21 A sign extension unit extends a two’s complement number from M to N ($N > M$) bits by copying the most significant bit of the input into the upper bits of the output (see Section 1.4.6). It receives an M-bit input A and produces an N-bit output Y. Sketch a circuit for a sign extension unit with 4-bit input and an 8-bit output.

Exercise 5.23 Compute $111001.0002/001100.0002$ in binary using the standard division algorithm from elementary school. Show your work.