Homework 5: EE 252 Digital Electronics

1. Determine the decimal values of the following unsigned numbers:

      (a) $(0111011110)_2$
      (b) $(1011100111)_2$
      (c) $(3751)_8$
      (d) $(A25F)_{16}$
      (e) $(F0F0)_{16}$

2. Determine the decimal values of the following 2's complement numbers:

      (a) 0111011110
      (b) 1011100111
      (c) 1111111110

3. Perform the following operations involving eight-bit 2's complement numbers and indicate whether arithmetic overflow occurs. Check your answers by converting to decimal sign- and-magnitude representation.

00110110	01110101	11011111
+ 01000101	+ 11011110	+ 10111000

00110110	01110101	11010011
− 00101011	− 11010110	− 11101100

4. Show that the circuit in Figure 3.4 implements the full-adder specified in the Truth table below.

| c_i	x_i	y_i	c_{i+1}	s_i
0	0	0	0	0
0	0	1	0	1
0	1	0	0	1
0	1	1	1	0
1	0	0	0	1
1	0	1	1	0
1	1	0	1	0
1	1	1	1	1

(a) Truth table
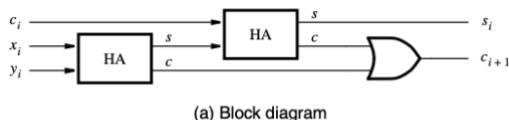
(a) Block diagram
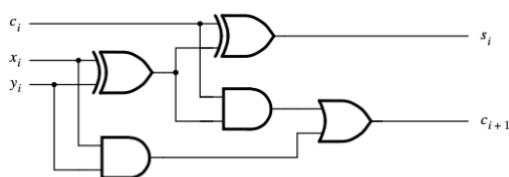
(b) Detailed diagram

Figure 3.4   A decomposed implementation of the full-adder circuit.