

Worksheet #1

Number Systems and Code

Objectives

- To revisit the representation of binary, decimal and hexadecimal values
- To do conversions from any radix base number to any other radix base number
- To understand the representation of character in computer

1. Convert the following decimal numbers to 16-bit binary:

- 1.1) 14 _____
1.2) 189 _____
1.3) 257 _____
1.4) 472 _____

2. Convert the following decimal numbers to hex:

- 2.1) 14 _____
2.2) 189 _____
2.3) 257 _____
2.4) 472 _____

3. Convert the following hex numbers to decimal:

- 3.1) 0x37 _____
3.2) 0xAB _____
3.3) 0x0147 _____
3.4) 0x2AE1 _____

4. Convert the following hex numbers to binary:

- 4.1) 0x37 _____
4.2) 0xAB _____
4.3) 0x0147 _____
4.4) 0x2AE1 _____

5. Convert the following binary numbers to hex:

- 5.1) 0010 1101 _____
5.2) 1010 1010 _____
5.3) 1110 0011 _____
5.4) 0010 1001 1011 0101 _____

6. Convert the following binary numbers to decimal:

- 6.1) 0010 1101 _____
6.2) 1010 1010 _____
6.3) 1110 0011 _____
6.4) 0010 1001 1011 0101 _____

7. What is the range of unsigned decimal values that can be represented by 8 and 16 bits?

8. What is the range of signed decimal values that can be represented by 8 and 16 bits?

9. How many bits are required to represent decimal values ranging from 75 to -75?

10. Represent each of the following values as a 6-bit signed binary number in one's complement and two's complement forms.

- (a) 28 _____
(b) -21 _____
(c) -5 _____
(d) -13 _____

11. Determine the decimal equivalent of two's complement numbers given below:

- (a) 10101010 _____
(b) 01110110 _____
(c) 11100010 _____

12. What does the following list of 7-bit ASCII code represent?

1011001 1100101 1100011 1100011 1100011 1101000 0100001

13. Write 7-bit ASCII (American Stand Code for Information Interchange) code of your first and last name.
