Mathematics for Computing

Hibernia College

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1 Numbers and Number Systems

- Binary to Decimal conversion
- Decimal to Binary conversion
- Decimal to Hexadecimal conversion
- Hexadecimal to Decimal conversion
- Floating Point Notation
- Membership Tables

2 Number Systems

1. Binary
2. DEcimal
3. Hexadecimal
4. Octal

- Decimal Number - What you are probably used to.
- Binary - Zeroes and Ones.
- Hexadecimal - examples: RGB and Colours.

3 Decimal to Binary Conversion(1.4.1)

- Continuously divide the decimal number by 2.
- Keep record of the remainder, either 0 or 1.
- The sequence of remainders is the binary number required.

4 Binary Conversation

The binary number 100101 is converted to decimal form as follows:

$$100101_2 = [(1)\times 2^5]+[(0)\times 2^4]+[(0)\times 2^3]+[(1)\times 2^2]+[(0)\times 2^1]+[(1)\times 2^0]$$

$$100101_2 = [1\times 32]+[0\times 16]+[0\times 8]+[1\times 4]+[0\times 2]+[1\times 1]$$

$$100101_2 = 37_{10}$$

5 Binary Arithmetic

5.1 Binary Substraction

Exercises: 6. 110 - 10
7. 101 - 11
8. 1001 - 11
9. 1101 - 11
10. 10001 - 100