W4D1: Integers

Source:

The Essentials of Computer Organization and Architecture, third Edition, Linda Null and Julia Lobur

Chapter 2: Data Representation in Computer Systems. Questions: 3a, 4a, 5, 6, 8ad, 14, 26

Questions:

- Convert 26.78125 to binary with a maximum of six places to the right of the binary point
- Convert 25.84375 to binary with a maximum of six places to the right of the binary point
- Convert the hexadecimal number AC12 to binary
- Represent each of the following decimal numbers in all of the following binary formats: 8-bit signed magnitude, one's complement and two's complement
  a) 77
  b) -42
- What decimal value does the 8-bin binary number 10011110 have if:
  a) it is interpreted as an unsigned integer?
  b) It is on a computer using signed-magnitude representation?
  c) It is on a computer using one's complement representation?
  d) It is on a computer using two's complement representation?
- Given a (very)tiny computer that has word size of 6 bits, what are the smallest negative numbers and the largest positive numbers that this computer can represent in each of the following representations?
  a) One's complement
  b) Two's complement
- Using arithmetic shifting, perform the following:
  a) Double a the value of binary 00010101
  b) quadruple the value of binary 01110111
  c) Divide the value of binary 11001010 in half