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Introduction to Computer Science, Winter Semester 2017
Practice Assignment 9B

Discussion: 23.12.2017 - 28.12.2017

Exercise 9B-1 To be Discussed in Tutorial

What would be the ranges of numbers that can be represented by sign/magnitude, 1's complement, and 2's complement using the following number of bits:

- 3 bits
- 8 bits
- 10 bits

Justify your answer.

Exercise 9B-2 To be Discussed in Tutorial

Write the 8-bit sign magnitude, 1's complement and 2's complement representations for each of these decimal numbers:

- +18
- +115
- 49
- 100

Exercise 9B-3 To be Discussed in Tutorial

Perform the addition of the following binary numbers.

- $0.011 + 0.0101$
- $101 + 1.01$
- $1011 + 1.11$
- $101.01 + 1011.01$

Exercise 9B-4 To be Discussed in Tutorial

Subtract the following 4-bit binary numbers which are represented using the two's complement notation and give the results in the decimal system (base 10).

- $1011 - 1001$
- $1100 - 0110$
- $1010 - 0011$

d) $1011 - 1101$

e) $0111 - 1001$

f) $1100 - 1100$

Exercise 9B-5 To be Discussed in Tutorial

Assume that our computer stores decimal numbers using 8 bits. Perform the following subtractions using 2's complement notation:

a) $26 - 13$

b) $29 - 36$

c) $18 - 19$

Exercise 9B-6 To be Discussed in Tutorial

Assume that our computer stores decimal numbers using 5 bits. Perform the following operation using 2's complement notation:

$-13 - 12$