MIE-ARI
(Computer Arithmetic – Homework 1)

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https://courses.fit.cvut.cz/MIE-ARI/

Task 1 – number conversion

- Assignment: Convert number $540{,}75_{10}$ into a binary system.

Task 2 – addition of non-negative numbers

a)

10110

01011

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b)

01101

10011

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c)

01010

00110

Task 3 – subtraction of non-negative numbers without using 2's complement code

Advice: Check the result with the subtraction of the numbers in the decimal system.

a)

10101

-01111

b)

110111

- 01111

c)

01111

-10011

Task 4 – numbers representation in the computers

- Representation of numbers without sign: number format

n=3, -m=0

n=0, -m=-3

a) 137_{10} – Binary number format

b) 5831_{10} – decimal number format

Task 5 – numbers representation in the computers

- Negative numbers representation: **sign and magnitude code**

a) n=3, m=0 represent number +3 and -3

+3

-3

Task 6 – numbers representation in the computers

- Negative numbers representation : **biased code type 0**

a) n=3, m=0 represent number +3 and -3

+3

-3

Task 7 – numbers representation in the computers

- Negative numbers representation : **2’s complement code**

a) n=3, m=0 represent number +3 and -3

+3

-3

Task 8 – 2’s complement code I.

- What is a difference between carrying out from higher order and overflow?
- Realize test for appropriate numbers n=7, m=0.
- What is a range of numbers which can be represented?

Task 8 – 2's complement code II.

Assignment: Calculate examples in the decimal system and a binary system using 2's complete code. It is necessary to keep the number format.
Analyze cases, where the result is wrong.

a)

50
+30

b)

50
+100

c)

100
-50

d)

50
-100

e)

-50
-100

f)

-50
-30