MIE-ARI
(Computer Arithmetic – Homework 2)

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

Task 1 – Negative number representation – all codes

- **Fill the following table:**

number representation		sign and magnitude	2's complement	1's complement	biased type 0	biased type 1
binary	decimal					
0000	0					
0001	1					
-	-					
0111	7					
1000	8					
1001	9					
-	-					
1111	15					

Task 2 – Negative number representation - addition

Add two numbers using 1's complement code (diminished radix complement).
Write the image of each addend and sum on the left side in the decimal system with a sign.
Analyze when an overflow occurs. For n=3. (4bits adder)
Specify an allowable range of numbers for n=3.

a)	b)	c)	d)
1001	0110	1001	0110
0111	1000	1100	0011

Advice: Carry out from the higher-order must be added to the lower order (circular carry).

Task 3 – Negative number representation - addition

Add two numbers using biased code type 0.
Write the image of each addend and sum on the left side in the decimal system with a sign.
Analyze when an overflow occurs. For n=2. (3bits adder)
Specify an allowable range of numbers for n=2.

a)	b)	c)	d)
101	101	011	011
110	111	010	000

Advice: Negate bit of the sum in higher order.

Task 4 – Negative number representation - addition

Add two numbers using biased code type 1.
Write the image of each addend and sum on the left side in the decimal system with a sign.
Analyze when an overflow occurs. For n=2. (3bits adder)
Specify an allowable range of numbers for n=2.

a)	b)	c)	d)
100	100	010	010
101	111	001	000

Advice: Add one to the lower order of the sum and then negate the bit in the higher order of the result.

Notes I.

Notes II.