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## KDI exercise sheet no 1

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For the record, I'm using '.'s as decimal separator

### Exercise 1: Number conversions

a)  $1011\ 1010\ 1110\ 1001\ 0101\ 1100_2 = \text{bae95c}_{16} = 12\ 249\ 436_{10}$

b)  $1011.001_2 = 11.125_{10}$

c)  $13.25_{10} = 1101.01_2$

### Exercise 2: Arithmetics

a)  $13_{10} = 1101_2$   
 $17_{10} = 1\ 0001_2$   
Ones' Complement:

$$\begin{aligned} 1101_2 - 1\ 0001_2 &= 1101_2 + (-1\ 0001_2) \\ &= 1101_2 + 1110\ 1110_2 \\ &= 1111\ 1011_2 \\ &= -100_2 \\ &= -4_{10} \end{aligned}$$

Two's Complement:

$$\begin{aligned} 1101_2 - 1\ 0001_2 &= 1101_2 + (-1\ 0001_2) \\ &= 1101_2 + (1110\ 1110_2 + 1_2) \\ &= 1111\ 1100_2 \\ &= -(11_2 + 1_2) \\ &= -100_2 \\ &= -4_{10} \end{aligned}$$