Assignment 1 – Skript-Aufgabe 30 (4 points)

Show that the following sets of functions are complete for the set of binary Boolean functions.

b) \{OR, NOT\}  
c) \{NAND\}  
d) \{NOR\}, where NOR := NOT \circ OR.  
e) \{XOR, AND\}

You may use the fact that the sets \{AND, OR, NOT\} and \{AND, NOT\} both are complete for the set of binary Boolean functions.

Assignment 2 – Skript-Aufgaben 32-33 (4 points)

(i) \(x \neq 3 < 2 \lor y \land \neg 3 \leq 4 - 2 \times 3\)  
(ii) \(z > 1 \land \neg x = 2 - 2 == 1 \land y\)  
(iii) \(3 \times z > z \lor \frac{1}{x} \neq 0 \land 3 + 4 > 7\)

a) Parenthesize the above expressions according to operator precedences and associativities.

b) Evaluate the expressions step-by-step, assuming that \(x, y,\) and \(z\) are all of type int with \(x==0, y==1,\) and \(z==2.\)

Assignment 3 – Skript-Aufgabe 48 (4 points)

Write a program cross_sum.cpp that inputs a natural number \(n\) and outputs the sum of the (decimal) digits of \(n\). For example, for \(n==10\) the output is 1 and for \(n==112\) the output is 4.

Assignment 4 – Skript-Aufgabe 47 (4 points)

Write a program dec2bin.cpp that inputs a natural number \(n\) and outputs the binary digits of \(n\) in reverse order. For example, for \(n==2\) the output is 01 and for \(n==11\) the output is 1101.
Challenge - Skript-Aufgabe 36