

Programmierpraktikum

Exercise Sheet #4

WS, 2012/2013

Remember to follow the instructions to send the exercises, as explained in sheet #3.

Conjunction, Disjunction, Negation

Conjunction \wedge (&&), Disjunction \vee (||), negation \neg (!), equality $=$ (==), inequality \neq (!=).

- Write a program that checks for a pair of cases if the following logical laws apply:
 1. $a \vee (b \vee c) = (a \vee b) \vee c$ (Use `boolean` variables for a , b and c)
 2. $a \wedge (b \vee c) = (a \wedge b) \vee (a \wedge c)$
 3. $a \wedge (a \vee b) = a$
 4. $a \vee \neg a = \text{True}$
 5. $(a = b) \neq (a \neq b)$ (in this case, use characters and numerical variables for a and b . Try combining variables of different types).

Loops, logical operations

Use nested `for` or `while` loops and logical operators to generate the *truth tables* (a table of the output obtained for each possible input) of the and (\wedge) and or (\vee) operators.

Hint: loop over a `boolean` array.

If-then-[else], for statements

- Define two `int` and three `double` variables and use an `if` statement to print a sentence declaring if one is greater, smaller or equal to the other one, or none of those options, for all combinations of values.

Loops, Math library

Write a program that calculates the value x for which the curve of the function $f(x) = \tan(x + 7)/\log(x)$ intercepts that of the function $g(x) = \cos(x - 1)$ between $x = 2$ and $x = 3$. Write the code such that it is easy to modify it in order to compare other pair of functions or in another interval. The program should print the solution as soon as the (first) solution is found, and end properly immediately after.

Hint: You can use the *bisection* method: https://en.wikipedia.org/wiki/Bisection_method