Introduction to Computer Science

Laboratory 4

November 10, 2024

1. Write the expression result and how it affects the variables involved.

(a) a++ > 3 && 4 == 4 with a = 3
(b) ++a > 3 && 4 == 4 with a = 3
(c) a++ || j >= 0 with a = 0 and j = 0
(d) j>=0 || a++ with a = 0 and j = 0
(e) a++ && --j >= 0 with a = 0 and j = 1
(f) 1 > 0 || 1/0
(g) 1/0 || 1 > 0
(h) (a = 7) > 0 with a = -3
(i) (a = 7) > 0 && (b = 44) > 44 with a = -3 and b = 150
(j) (a = 7) > 0 || (b = 44) > 44 with a = -3 and b = 150
(k) (7 - (a = (b + 1))) == 1 with a = 3 and b = 5

2. Write the output of the following two C programs.

#include <stdio.h> #include <stdio.h> int main() { int main() { int i = 0;int i = 0;int j = 5;int j = 5;j = j + +;j = ++j;while (i < j) { while (i < j) { i + +;i++; $printf("\%i \setminus n", i);$ $printf("\%i \setminus n", i);$ } } return 0; return 0; } }

- 3. Solve all the exercises present in the 4^{th} tutorial.
- Write a C program that asks the user for an integer n and tells if n is a perfect number or not. A number is perfect if is equal to the sum of its divisors, excluding itself. (e.g. 6 is perfect because 6 = 1 + 2 + 3).

- 5. Write a C program that asks for two integers a and b and then prints the Least Common Multiple (LCM) between a and b (e.g. with a=4 and b=6 the output should be 24).
- 6. Write a C program that asks for two integers x and y and then prints the result of x^y .
- 7. Write a C program that, given an integer n prints out all the perfect numbers less or equal than n.
- 8. Write a C program that asks the user for an integer number **n** and tells if the number is automorphic. A number is automorphic is its square ends in the same digit, for example 25 is automorphic because both 25 and 625 (25^2) ends in 5.