

Computer Programming - Laboratory test 1A

Solve all tasks in a single source file. Upload it on Teams as: *Lastname_Firstname_prb1.c*.
All constraints should be assumed to be valid. Commented code is ignored.

0.5p if code compiles and is formatted correctly;
1p for reproducing the outputs for the given examples.

Problem 1 - Infinite digits

a) Declare and read the natural numbers n , b and x . Declare two arrays, each with 100 elements initialized with zeroes. Write a function which prints an array.

Constraints: $0 < n, x \leq 10^9$, $1 < b \leq 1000$

b) Write a function which receives as input a natural number n and an array. The function finds and saves all the distinct prime factors of n in the array and returns their number.

Examples:

For $n = 4$, the function returns 1 and saves 2 in the array;

For $n = 30$, the function returns 3 and saves 2, 3 and 5 in the array.

c) It is known that the number $1/x$ has finite digits in base b if and only if the prime factors of x are a subset of the prime factors of b . Determine if $1/x$ has a finite representation or not.

Examples:

$b = 2, x = 4$, $1/x$ has finite digits in base b ;

$b = 10, x = 3$, $1/x$ has infinite digits in base b ;

$b = 1000, x = 25$, $1/x$ has finite digits in base b .