

Computer Programming - Laboratory test 1B

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 - Alphabetic

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

Constraints: $0 < k, x \leq 10^9, 1 < b \leq 16$

b) A number x is called alphabetic in base b if all of its digits in base b are letters. Write a function which expects as input a number x (in base 10) and a base b and returns 1 if the number is alphabetic or 0 otherwise.

Examples:

$x = 10, b = 16,$ x is alphabetic in base b , return 1;
 $x = 15, b = 2,$ x is not alphabetic in base b , return 0.

c) Find the k^{th} alphabetic number in base 16. Give your answer in base 10. You get partial score for an implementation which runs under one second for $k \leq 10^4$.

Examples,

$k = 3,$ the answer is $12 = C_{(16)}$;
 $k = 36,$ the answer is $239 = EF_{(16)}$;
 $k = 1000000000,$ the answer is $208678414052573 = BDCA\ BABD\ ECDD_{(16)}$.