Theoretical midterm

Name: .....

Data structures and algorithms (GEMAK117-MA)

April 15, 2024

Neptun code: .....

Exercise 1 (12 points)**.** State the following definitions:

a) (1 point) whole remainder, mod operation:

b) (1 point) time complexity:

c) (1 point) big O notation:

d) (1 point) polynomial growth rate:

e) (1 point) stack (data structure):

f) (1 point) open address hash table:

g) (1 point) Fibonacci numbers:

h) (1 point) linear combination:

i) (1 point) relative primes:

j) (1 point) congruence:

k) (1 point) multiplicative inverse:

l) (1 point) median:

Exercise 2 (5 points)**.** State the following theorems:

a) (1 point) number of digits (in base b):

b) (1 point) recursion of the greatest common divisor:

c) (1 point) Fermat's little theorem:

d) (2 points) the solvability of the linear congruence equation:

Exercise 3 (3 points)**.** Write down the algorithm for the **partition algorithm**.

Scoring: total 20 points.
10-11 points: 2 (pass),
12-13 points: 3 (mediocre),
14-15 points: 4 (good),
16-20 points: 5 (excellent).