



## Problem 1. «A digital signature»

Alice uses a new digital signature algorithm that turns a text message  $M$  into a pair  $(M, s)$ , where  $s$  is an integer and generated in the following way:

1. The special function  $h$  transforms  $M$  into a big positive integer  $r = h(M)$ .
2. The number  $t = r^2$  is calculated, where  $t = \overline{t_1 t_2 \dots t_n}$ .
3. The signature  $s$  is calculated as  $s = t_1 + t_2 + \dots + t_n$ .

Bob obtained the signed message

(Congratulations on the fifth year anniversary of NSUCRYPTO!, 2018)

from Alice and immediately recognized that something was wrong with the signature! How did he discover it?

**A remark.** By  $t = \overline{t_1 t_2 \dots t_n}$  we mean that  $t_1, t_2, \dots, t_n$  are decimal digits and all digits over the bar form decimal number  $t$ .

