

Ejercicio 1. Design a Turing Machine to solve the problem defined below and implement your solution on the GOLD Turing Machine simulator.

The TM starts in the following configuration:

$\# \beta : \omega !$

where:

- β is a nonempty string of symbols not in $\{\#, :, !\}$
- ω is a nonempty string of symbols not in $\{\#, :, !\}$

The machine must determine if $\omega = \beta^t$ for some $t > 0$. If so, the final configuration should be: $\underline{Y}X!$ where X is the decimal representation of t . If not, the final configuration should be: N .

It does not matter what is to the left or to the right of the answer N or Y . You can also have things to the right of N

These are some examples of initial and final configurations.

Initial	Final
$\#abc : abcabcabc!$	$\dots \underline{Y}3! \dots$
$\#abcd : abcdabcdabcdabcd!$	$\dots \underline{Y}4! \dots$
$\#abcd : abcdabcedabcdabcd!$	$\dots \underline{N} \dots$

You may use any machine shown in class.