

Powerful Numbers (prob1)

The Problem

In the July 2006 edition of the Mathematical Gazette, Note 90.32 gives the following definition for powerful number. The n -digit positive integer $N = a_n a_{n-1} \dots a_1$ is defined as a powerful number if $f(N) = N$, where $f(N) = a_n + a_{n-1}^2 + \dots + a_1^n$.

So given a number N , one may wish to determine if it is powerful.

Input

Each line will contain a decimal number N whose length is at most 100 digits and its first digit will be nonzero. Input will be terminated by a line containing only a 0. It is not to be processed.

Output

For each number, print it followed by the string "is/is not a powerful number." Depending on whether it is or is not a powerful number.

Sample Input

```
5
89
98
0
```

Sample Output

```
5 is a powerful number.
89 is a powerful number.
98 is not a powerful number.
```