1.

Given an integer, we need to find the *super digit* of the integer.

- If x has only 1 digit, then its super digit is x.
- Otherwise, the super digit of x is equal to the super digit of the sum of the digits of x.

For example, the super digit of 9875 will be calculated as:

```
super_digit(9875)       9+8+7+5 = 29
super_digit(29)         2 + 9 = 11
super_digit(11)         1 + 1 = 2
super_digit(2)          = 2
```

Example

$n =' 9875'$
$k = 4$

The number p is created by concatenating the string n k times so the initial $p = 9875987598759875$.

```
superDigit(p) = superDigit(9875987598759875)
              9+8+7+5+9+8+7+5+9+8+7+5+9+8+7+5 = 116
superDigit(p) = superDigit(116)
              1+1+6 = 8
superDigit(p) = superDigit(8)
```

All of the digits of p sum to 116. The digits of 116 sum to 8. 8 is only one digit, so it is the super digit.

Function Description

Complete the function *superDigit* in the editor below. It must return the calculated super digit as an integer.

superDigit has the following parameter(s):

- *string n:* a string representation of an integer
- *int k:* the times to concatenate n to make p

Returns

- *int:* the super digit of n repeated k times

Input Format

The first line contains two space separated integers, n and k.

Constraints

- $1 \leq n < 10^{100000}$
- $1 \leq k \leq 10^5$

2.

For example, if $X = 13$ and $N = 2$, we have to find all combinations of unique squares adding up to 13. The only solution is $2^2 + 3^2$.

Function Description

Complete the *powerSum* function in the editor below. It should return an integer that represents the number of possible combinations.

powerSum has the following parameter(s):

- *X:* the integer to sum to
- *N:* the integer power to raise numbers to

Input Format

The first line contains an integer X.
The second line contains an integer N.

Constraints

- $1 \leq X \leq 1000$
- $2 \leq N \leq 10$

Output Format

Output a single integer, the number of possible combinations caclulated.