Recursive Digit Sum

We define super digit of an integer x using the following rules:

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
```

You are given two numbers n and k. The number p is created by concatenating the string n k times. Continuing the above example where $n = 9875$, assume your value $k = 4$. Your initial $p = 9875\ 9875\ 9875\ 9875$ (spaces added for clarity).

```
superDigit(p) = superDigit(9875987598759875)
              5+7+8+9+5+7+8+9+5+7+8+9+5+7+8+9 = 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's 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):

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

Input Format

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

Constraints

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

Output Format

Return the super digit of p, where p is created as described above.

Sample Input 0

```
148 3
```

Sample Output 0

```
3
```

Explanation 0

Here $n = 148$ and $k = 3$, so $P = 148148148$.

```
super_digit(P) = super_digit(148148148)
               = super_digit(1+4+8+1+4+8+1+4+8)
               = super_digit(39)
               = super_digit(3+9)
               = super_digit(12)
               = super_digit(1+2)
               = super_digit(3)
               = 3.
```

Sample Input 1

```
9875 4
```

Sample Output 1

```
8
```

Sample Input 2

```
123 3
```

Sample Output 2

9

Explanation 2

Here $n = 123$ and $k = 3$, so $P = 123123123$.

```
super_digit(P) = super_digit(123123123)
               = super_digit(1+2+3+1+2+3+1+2+3)
               = super_digit(18)
               = super_digit(1+8)
               = super_digit(9)
               = 9
```