

Finding the exponent of any number can be very troublesome as it grows exponentially. But in this problem you will have to do a very simple task. Given two non-negative numbers m and n , you will have to find the last digit of m^n in decimal number system.

Input

The input file contains less than 100000 lines. Each line contains two integers m and n (Less than 10^{101}). Input is terminated by a line containing two zeroes. This line should not be processed.

Output

For each set of input you must produce one line of output which contains a single digit. This digit is the last digit of m^n .

Sample Input

```
2 2
2 5
0 0
```

Sample Output

```
4
2
```