AMERICAN COMPUTER SCIENCE LEAGUE

2019-2020 **Contest #1**

Senior Division - Number Transformation

PROBLEM: Given a positive integer (call it N) and a position in that integer (call it P) transform N. To transform N, find the P^{th} digit of N from the right:

- Replace each of the digits to the left by the sum of that digit and the P^{th} digit.
- Replace each of the digits to the right by the absolute value of the difference between it and the P^{th} digit.
- Replace the P^{th} digit by the number of different prime factors of N. Note that 1 is not a prime number, and it has no prime factors. A prime number has exactly one prime factor (namely, itself).

Example 1: N=102438, P=3. There are 4 different prime factors of N (2, 3, 7, 271). The transformed value N is (1+4)(0+4)(2+4)(4)(|3-4|)(|8-4|) => 5 4 6 4 1 4 => 546414

Example 2: N=4329, P=1. There are 3 different prime factors of N (3, 13, 37). The transformed value of N is (4+9)(3+9)(2+9)(3) => 13 12 11 3 => 1312113

INPUT: There will be 5 sets of data. Each set contains two positive integers: N and P. N will be less than 10^{15} , and P will be valid.

OUTPUT: The transformed value of each input set. The printed number may not have any spaces between the digits.

SAMPLE INPUT: (http://www.datafiles.acsl.org/2020/contest1/sr-sample-input.txt)

```
102438 3
4329  1
6710  2
16807  1
60098065452   7
```

SAMPLE OUTPUT:

1. 546414
2. 1312113
3. 7841
4. 8131571
5. 1488173823436