Problem X

Huge Mod

Input: standard input
Output: standard output
Time Limit: 1 second

$$2^{3^{4^5}} \bmod 10 = ?$$

The operator for exponentiation is different from the addition, subtraction, multiplication or division operators in the sense that the default associativity for exponentiation goes right to left instead of left to right. So unless we mess it up by placing parenthesis, 2^{3^2} should mean $2^{(3^2)} = 2^9 = 512$ not $(2^3)^2 = 8^2 = 64$. This leads to the obvious fact that if we take the levels of exponents higher (i.e., 2^3^4^5^3), the numbers can become quite big. But let's not make life miserable. We being the good guys would force the ultimate value to be no more than 10000.

Given a_1, a_2, a_3, ... , a_N and m(=10000)

you only need to compute a_1^a_2^a_3^...^a_N mod m.

Input

There can be multiple (not more than 100) test cases. Each test case will be presented in a single line. The first line of each test case would contain the value for M(2<=M<=10000). The next number of that line would be N(1<=N<=10). Then N numbers - the values for a_1, a_2, a_3, ... , a_N would follow. You can safely assume that 1<=a_i<=1000. The end of input is marked by a line containing a single hash ('#') mark.

Output

For each of the test cases, print the test case number followed by the value of a_1^a_2^a_3^...^a_N mod m on one line. The sample output shows the exact format for printing the test case number.

Sample Input

```
10 4 2 3 4 5
100 2 5 2
53 3 2 3 2
#
```

Sample Output

```
Case #1: 2
Case #2: 25
Case #3: 35
```

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