2273 Optimal Polynom

The positive integer K and a string S, that contains digits from 0 to 9, are given. The string S can be partitioned into some not empty substrings $S[0], S[1], S[2], \ldots$ so that $S[0] + S[1] + S[2] + \ldots = S$ (+ is a concatenation operation, $S[0]$ is the head of S). Each partition of the string S into M substrings defines a polynom $P(x) = a[0] + a[1] * x + a[2] * x^2 + \cdots + a[M] * x^M$, where $a[i]$ is the number designated by the substring $s[i]$.

For example, the string $S = 1204$ can be partitioned into $S = 1 + 204$ (polynom $P(x) = 1 + 204 * x$), into $S = 1 + 2 + 04$ (polynom $P(x) = 1 + 2 * x + 4 * x^2$) etc. You must write a program that finds the polynom that has the minimum value $P(K)$ from all possible polynoms that can be built from S.

It is known that the maximum magnitude of the result cannot exceed $12 * 10^{14}$.

Input

There is one number in the first line — the number of tests. Each test is on a single line, containing the number K and the string S separated by one space.

Output

For each test you must write on one line the polynom that has the minimum value $P(K)$. If there exist several optimal polynoms, you must write the one that has the minimal degree. The polynom must be printed beginning with the lowest degree.

Note: For the second test of Sample Input you have $K = 3$, $S = 123$. S can be partitioned into (all possible partitions):

$S = 123$	polynom: $P(X) = 123$	value: $P(3) = 123$
$S = 1 + 23$	polynom: $P(X) = 1 + 23 * X$	value: $P(3) = 70$
$S = 12 + 3$	polynom: $P(X) = 12 + 3 * X$	value: $P(3) = 21$
$S = 1 + 2 + 3$	polynom: $P(X) = 1 + 2 * X + 3 * X^2$	value: $P(3) = 34$

Minimum polynom's value is 21 on partition $S = 12 + 3$, so the answer is $P(X) = 12 + 3 * X$.

Sample Input

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3
1 1234
3 123
1 1001
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Sample Output

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1 + 2 * X^1 + 3 * X^2 + 4 * X^3
12 + 3 * X^1
1 + 1 * X^1
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