Problem G. Infinite Fraction Path

The ant Welly now dedicates himself to urban infrastructure. He came to the kingdom of numbers and solicited an audience with the king. He recounted how he had built a happy path in the kingdom of happiness. The king affirmed Welly's talent and hoped that this talent can help him find the best infinite fraction path before the anniversary.

The kingdom has N cities numbered from 0 to $N-1$ and you are given an array $D[0 \cdots N-1]$ of decimal digits ($0 \le D[i] \le 9$, $D[i]$ is an integer). The destination of the only one-way road start from the i-th city is the city labelled $(i^2+1)\%N$.

A path beginning from the i-th city would pass through the cities u_1, u_2, u_3, and so on consecutively. The path constructs a real number $A[i]$, called the relevant fraction such that the integer part of it is equal to zero and its fractional part is an infinite decimal fraction with digits $D[i], D[u_1], D[u_2]$, and so on.

The best infinite fraction path is the one with the largest relevant fraction.

Input

The input contains multiple test cases and the first line provides an integer up to 100 indicating to the total number of test cases.

For each test case, the first line contains the integer N ($1 \le N \le 150000$). The second line contains an array of digits D, given without spaces.

The summation of N is smaller than 2000000.

Output

For each test case, you should output the label of the case first. Then you are to output exactly N characters which are the first N digits of the fractional part of the largest relevant fraction.

Sample

4 3 149 5 12345 7 3214567 9 261025520	Case #1: 999 Case #2: 53123 Case #3: 7166666 Case #4: 615015015

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