Given two polynomials $f(x)$ and $g(x)$ in Z_n, you have to find their GCD polynomial, ie, a polynomial $r(x)$ (also in Z_n) which has the greatest degree of all the polynomials in Z_n that divide both $f(x)$ and $g(x)$. There can be more than one such polynomial, of which you are to find the one with a leading coefficient of 1 (1 is the unity in Z_n. Such polynomial is also called a *monic polynomial*).

Note: A function $f(x)$ is in Z_n means all the coefficients in $f(x)$ is *modulo* n.

Input

There will be no more than 101 test cases. Each test case consists of three lines: the first line has n, which will be a prime number not more than 1500. The second and third lines give the two polynomials $f(x)$ and $g(x)$. The polynomials are represented by first an integer D which represents the degree of the polynomial, followed by $(D + 1)$ positive integers representing the coefficients of the polynomial. the coefficients are in decreasing order of Exponent. Input ends with $n = 0$. The value of D won't be more than 100.

Output

For each test case, print the test case number and $r(x)$, in the same format as the input

Note: The first sample input has $2x^3 + 2x^2 + x + 1$ and $x^4 + 2x^2 + 2x + 2$ as the functions.

Sample Input

```
3
3 2 2 1 1
4 1 0 2 2 2
0
```

Sample Output

```
Case 1: 2 1 2 1
```