Problem F
Multiplying Two Polynomials

Time limit: 5 seconds
Memory limit: 256 megabytes

Problem Description

Given an integer n, two polynomial $f(x) = a_0 + a_1x + \cdots + a_{n-1}x^{n-1}$ and $g(x) = b_0 + b_1x + \cdots + b_{n-1}x^{n-1}$. Compute $h(x) = f(x)g(x) = c_0 + c_1x + \cdots + c_{2n-2}x^{2n-2}$.

Input Format

The first line of the input contains an integer t ($t \leq 10$) indicating the number of test cases. Each test case consists of three lines. On the first line, there is an integer n ($n \leq 32768$). The maximum degree of f and g is $n-1$. Each of the second and the third line consists of n integral coefficients $a_0, \ldots, a_{n-1}$ and $b_0, \ldots, b_{n-1}$ separated by blanks, respectively. You may assume all coefficients are in $[-100, 100]$.

Output Format

For each test case, output the coefficients $c_0, \ldots, c_{2n-2}$ of the product of $f(x)$ and $g(x)$.

Sample Input

```
3
5
2 3 -2 0 0
-3 -3 0 -2 -1
5
2 1 1 -2 -3
-3 0 0 1 -2
5
-3 -2 0 -1 1
1 3 -1 1 1
```

Sample Output

```
-6 -15 -3 2 -8 1 2 0 0
-6 -3 -3 8 6 -1 -4 1 6
-3 -11 -3 -2 -7 2 -2 0 1
```