### SIENA COLLEGE

**25th Annual**

### High School Programming Contest

##### April 20, 2012

###### **Problem #5: FOIL++**

Background Information: The distributive property of multiplication over addition states that A \* (B + C) = A\* B + A \* C. Using the distributive property, you can multiply polynomials of any number of terms (not just 2 terms) together. FOIL works well for binomials, but not for polynomials of more than two terms.

In this problem, you will write a program that multiplies two polynomials of maximum degree 100 with integer coefficients (meaning at most 101 terms). Terms that would have zero coefficients are included, but the first coefficient of each polynomial will not be zero. The input will be on two lines; each line will represent a polynomial in the following order.

<number of terms> <coefficient 1> <coefficient 2> … <coefficient n>

One space exists in between all values. The coefficients are for the monomials in descending power. If the polynomial x2 – 4 (degree 2) were represented by its coefficients, then the input line would be

**3** **1 0 -4**

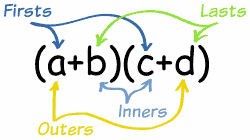
in that order. Your answer will be the product of the 2 polynomials in the exact same format as the input. A legal integer coefficient c will have |c| ≤ 1000.

###### Programming Problem:

Input: Two separate input lines of polynomials

Output: The product of the two polynomials

###### Example 1: Input: **2 1 1**

** 2 1 1**

###### Output: 3 1 2 1

###### Example 2: Input: **2 1 1**

**2 1 -1**

###### Output: 3 1 0 -1

###### Example 3: Input: **3 4 -4 -7**

**2 1 3**

###### Output: 4 4 8 -19 -21

###### Example 4: Input: **4 1 2 0 4**

**4 2 0 1 1**

###### Output: 7 2 4 1 11 2 4 4