Multiplying Polynomials

Multiplying polynomials of x and y. For example, to calculate

$$(-x^8y + 9x^3 - 1 + y).(x^5y + 1 + x^3)$$

getting the answer

$$-x^{13}y^2 - x^{11}y + 8x^8y + 9x^6 - x^5y + x^5y^2 + 8x^3 + x^3y - 1 + y$$

You are to write a program to perform such multiplications.

Input

The file of input data will contain pairs of lines, with each line containing no more than 80 characters. The final line of the input file contains a # as its first character. Each input line contains a polynomial written without spaces and without any explicit exponentiation operator. Exponents are positive non-zero unsigned integers. Coefficients are also integers, but may be negative. Both exponents and coefficients are less than or equal to 100 in magnitude. Each term contains at most one factor in x and one in y.

Output

Your program must multiply each pair of polynomials in the input, and print each product on a pair of lines, the first line containing all the exponents, suitably positioned with respect to the rest of the information, which is in the line below.

The following rules control the output format:

1. Terms in the output line must be sorted in decreasing order of powers of x and, for a given power of x, in increasing order of powers of y.

2. Like terms must be combined into a single term. For example, $40x^2y^3$ - $38x^2y^3$ is replaced by $2x^2y^3$.

3. Terms with a zero coefficient must not be displayed.

4. Coefficients of 1 are omitted, except for the case of a constant term of 1.

5. Exponents of 1 are omitted.

6. Factors of x^0 and y^0 are omitted.

7. Binary pluses and minuses (that is the pluses and minuses connecting terms in the output) have a single blank column both before and after.

8. If the coefficient of the first term is negative, it is preceded by a unary minus in the first column, with no intervening blank column. Otherwise, the coefficient itself begins in the first output column.

9. The output can be assumed to fit into a single line of at most 80 characters in length.

10. There should be no blank lines printed between each pair of output lines.

11. The pair of lines that contain a product should be the same length--trailing blanks should appear after the last non-blank character of the shorter line to achieve this.

Sample Input

```
-yx8+9x3-1+y
x5y+1+x3
1
1
#
```

Sample Output

```
   13 2     11         8        6     5       5 2      3       3
-x   y   - x   y + 8x y + 9x   - x y + x y   + 8x   + x y - 1 + y

1
```