

## Problem 6: Arbitrary Multiplication

In traditional "long multiplication" we determine the product of two integers,  $X$  and  $Y$ , by multiplying  $X$  by the individual digits of  $Y$ , in turn, starting with the units digit. The results of these multiplications are arranged appropriately and added, yielding the completed product.

The representation of these operations is usually done in a particular manner. Consider the multiplication of 123 by 95:

```

  123
  95
  ---
 615
1107
-----
11685

```

The numbers to be multiplied,  $X$  and  $Y$ , are each displayed on a separate line, followed by a horizontal line. The results of multiplying  $X$  by each digit of  $Y$  are then displayed on separate lines, followed by another horizontal line, and then the final product. In this problem you are to perform a sequence of such multiplications, displaying the results in this traditional representation, with the horizontal lines displayed using hyphens (minus signs).

### Input

There will be multiple input cases, sequentially numbered starting with 1. The input for each case will be a single line containing two integers,  $X$  and  $Y$ , separated by whitespace (one or more blanks and tab characters). Whitespace may also precede the first integer and follow the second integer. Each integer will have no more than 30 digits. A line containing only an end of line character follows the last case.

### Output

For each input case, first display the case number on a line by itself. Then perform the multiplication of  $X$  by  $Y$ , displaying the results in the form shown above and in the examples shown below. Follow the output for each multiplication by a blank line. If  $Y$  contains only a single significant digit, omit the second horizontal line and the sum (since in that case it would be superfluous). Display zeroes only when they are significant. There must be no unnecessary leading blanks on any output line. That is, the entire multiplication display must appear as far to the left as possible.

The number of hyphens in the first horizontal line should be the same as the number of significant digits in the larger of  $X$  and  $Y$ . The number of hyphens in the second horizontal line, if it is produced, should be the same as the number of significant digits in the product of  $X$  and  $Y$ .

**Sample Input**

```
4 7
135 46
    12345    862
this line contains only an end of line
```

**Output for the Sample Input**

Case 1:

```
4
7
-
28
```

Case 2:

```
135
 46
---
810
540
----
6210
```

Case 3:

```
    12345
      862
    -----
    24690
    74070
    98760
    -----
10641390
```