

**DWITE Online Computer Programming Contest  
January 2005**

**Problem 5**

**Different Bases Multiplication**

In normal everyday usage numbers are thought of in base 10. The reason for this is naturally due to humans having ten fingers on which to perform mathematical operations such as add, subtract and multiply. However, in computer technology, the use of low and high voltage states lends itself to thinking of operations defined on having only these two states. Hence, the binary system as a descriptive tool in computers is quite useful. Moreover, we could easily have a use for other number systems (cartoon characters counting in base 8, some alien species counting in base 97).

Your task is to take two different-base numbers, calculate their product, and return the answer in another base.

For example, "Find  $12_8 + 35_9$ , in base 10."

The input file (**DATA51.txt** for the first submission and **DATA52.txt** for the second submission) will contain five sets of data. The first line of each data set is the first number and its base, separated by a single space. The second line of each data set is the second number and its base, separated by a single space. The third line of each data set is the base in which the product is to be reported. All numbers will be positive and less than 5 digits in length. All bases will be integers from 2 to 10 inclusive.

The output file (**OUT51.txt** for the first submission and **OUT52.txt** for the second submission) will contain for each set of data, the product of the numbers in the specified base.

**Sample Input (Three sets given)**

```
12 8
35 9
10
121 7
121 7
7
1010 2
1010 3
4
```

**Sample Output**

```
320
14641
10230
```