CS1020E | Lab 9 | Exercise 2

Equation

Objectives

The objective of this exercise is to practice using **recursion** to solve problems.

Problem Description

Tony is learning mathematics, and he is interested in solving additive equations: $x + y = z$. In the equation, *x*, *y*, and *z* are integers. However, the exact values of *x*, *y*, and *z* are unknown. It is in the form of alphabet letters, for example

```
   ABBAC
+    BAC
---------
   ACCCD
```

where each alphabet letter represents a distinct digit (0–9). The same alphabet must represent the same digit. Leading zeros are permissible.

Tony has no problem finding an answer to this problem. However, now, he wants to know how many solutions are there to a given equation. You have to write a program to answer the question for Tony.

You would only **get at most 50% of the marks** if **recursion** is not used, in a **correct** and **meaningful** way.

Add your code only to the parts of the file indicated. Do not modify any other part of the given code, and do not add new files.

Inputs

The input contains three strings *x*, *y*, and *z* respectively, each occupies a line. Each string contains only alphabet letters 'A'–'G'. The length of each string is between 1 and 9 (inclusive).

Outputs

Output the number of solutions to the input equation.

Sample Input 1

```
AB
AB
BC
```

Sample Output 1

```
5
```

Explanation 1

The solutions are 12 + 12 = 24, 24 + 24 = 48, 25 + 25 = 50, 37 + 37 = 74, 49 + 49 = 98.

Sample Input 2

```
AB
AA
AC
```

Sample Output 2

```
0
```

Explanation 2

No solution.

Submission

You need to submit your completed **`Equation.cpp`** to CodeCrunch (https://codecrunch.comp.nus.edu.sg/) before the specified deadline. We will take only your latest submission.

Late submissions will not be accepted. The submission system in CodeCrunch will automatically close at the deadline.