Introduction to Computers and Programming

Homework 5

2023/10/17

1. Deadline

You have one week to complete the homework. Hand in your homework via E3 before 2023/10/24 23:55. Please finish your homework as soon as possible. In addition, make sure that your code can be executed on Visual Studio Community 2019.

2. Problems

2.1 Morse code

Before entering this class, there might not be any chance for you to learn Morse code. Therefore, we offer you a rare opportunity to implement a Morse Code Decoder. Voilà!

You will get some Morse code, and your job is to translate it into Arabic numerals.

By the way, you must use the template to solve this problem.

Input
A integer ***N*** represents the number of input lines of Morse code, followed by one or multiple lines of Morse code.

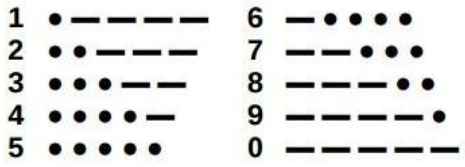
($1 \leq N \leq 10$, each line of Morse code will be less than 100 characters, including the '\0')

Output
Print out the translated numbers line by line, including the newline characters, even the last line.

Hint
A number is generated by 5 *dots* or *dahs*, that is, period or dash.

Between each character in numbers, there will be a space in Morse code.

You should regard the space character as a slash in Morse code.



Example 1 :

Input

1

.---- ....- ..--- ---.. ..... --...

Output (Symbol '↵' represents the presence of a newline character, not meant to be actually output.)

142857↵

Example 2 :

Input

3

.---- ....- ----- / .---- .---- ...-- / ---.. --... / ---.. --...

....--- .---- .---- ...-- / .---- .---- ....- ---.. ---..

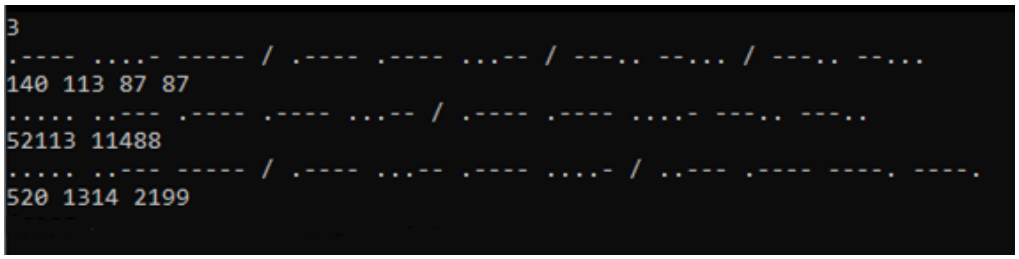
....--- ----- / .---- ...-- .---- ....- / ..--- .---- ----. ----.

Output (Symbol '↵' represents the presence of a newline character, not meant to be actually output.)

140 113 87 87↵

52113 11488↵

520 1314 2199↵



2.2 How many division case?

Given a number N, find out how many cases satisfy the following conditions:

The first number A divided by the second number B equals N, and both A and B are five-digit numbers that use each digit from 0 through 9 exactly once between them.

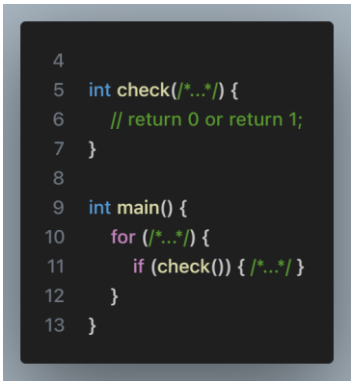
That is,

$$\frac{abcde}{fghij} = N$$

where each letter(a,b,c,d,e,f,g,h,i,j) represents a different digit. The first digit of one of the numerals is allowed to be zero.

Hint:

I would suggest creating a ‘check’ function to verify that the digits of A and B are all distinct. This can help keep your code clean and organized. For example,



```
4
5   int check(/*...*/) {
6       // return 0 or return 1;
7   }
8
9   int main() {
10      for (/*...*/) {
11          if (check()) { /*...*/ }
12      }
13  }
```

Input
A integer ***N*** represents the result of division between two five-digit numbers.

($2 \leq \boldsymbol{N} \leq 79$)

Output
The number of possible cases.

Example:
Input
3

Output (Symbol '↵' represents the presence of a newline character, not meant to be actually output.)
8↵

Explanation
17469 / 05823 = 3

17496 / 05832 = 3

50382 / 16794 = 3

53082 / 17694 = 3

61749 / 20583 = 3

69174 / 23058 = 3

91746 / 30582 = 3

96174 / 32058 = 3

There are 8 possible cases.

Input
4

Output (Symbol '↵' represents the presence of a newline character, not meant to be actually output.)
12↵

Explanation
15768 / 03942 = 4

17568 / 04392 = 4

23184 / 05796 = 4

31824 / 07956 = 4

60948 / 15237 = 4

68940 / 17235 = 4

69408 / 17352 = 4

81576 / 20394 = 4

81756 / 20439 = 4

86940 / 21735 = 4

94068 / 23517 = 4

94860 / 23715 = 4

There are 12 possible cases.

Input
66

Output (Symbol '↵' represents the presence of a newline character, not meant to be actually output.)
1↵

Explanation
83754 / 01269 = 66

There is 1 possible case.

Input
79

Output (Symbol '↵' represents the presence of a newline character, not meant to be actually output.)
0↵

Explanation
There are no possible cases for 79.

3. Submission format

Your submission should follow the format below, or you might get some penalty for the wrong format.

yourStudentID_hw_w06.zip

- /yourStudentID_hw_01.cpp
- /yourStudentID_hw_02.cpp

4. Reminders

- Please use the template provided in E3 to solve 2.1 Morse code.
  - Do NOT modify the main function.
  - Edit the TODO only, otherwise, you will get 0 points.
- Remember to change the filename before handing in the homework.