



CS3201

Algorithm Design

Project Report

Problem : 1014

Product of Digits

Submitted to

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1. Introduction

- Problem detail

Problem number : 1014

Problem name : Product of digits

Difficulty : 104

Problem Source: Ural State University Internal Contest '99 #2

Problem conditions :

- Time limit : 1.0 second

- Memory limit : 64 MB

Problem description : Your task is to find the minimal positive integer number Q so that the product of digits of Q is exactly equal to N .

Reference : <http://timus-new.k8n.ru/problem.aspx?space=1&num=1014>

- Input & Output

Input : The input contains the single integer number N ($0 \leq N \leq 109$).

Output : Your program should print to the output the only number Q . If such a number does not exist print -1 .

Sample

Input	Output
10	25

2. Code Overview

2.1 Solution

```
1  number = int(input())
2  result = ""
3  if number == 0:
4      print(10)
5  elif number == 1:
6      print(number)
7  else:
8      i = 9
9      while i >= 2:
10         while number % i == 0:
11             result += str(i)
12             number /= i
13             i -= 1
14         if number == 1:
15             print(result[::-1])
16         else:
17             print(-1)
```

2.2 Implementation steps

Line 1: We first declared a variable that is called 'number' and set it to receive the input from the user as well as convert itself to integer.

Line 2 : Declared a variable 'result' to collect the result data output that will show after the program has been terminated

Line 3 & 4 : Setting the default value to determine that if the users enter the number of 0, the program will return 10 immediately.

Line 5 & 6 : Setting a further condition from line 3 & 4 that if the number that the user enters is 1, the program will return 1 right away.

Line 7 - 17 is the condition apart from the number of 0 and 1 from Line 3 - 6 (Looping)

Line 8 : Declaring a temporary variable that have the value of 9 (More on that in the later coding process)

Line 9 : Setting up a loop with the condition while l is more than or equal to 2

Line 10 - 12 : Inside the first while loop, we set another while loop with the condition, while the number that can mod with 'i' equal to 0. We will add the number to the value of the result as well as casting it to a string. (Caution: The result number that we have declare is the empty

of string which is similar to String() in Java). After that, We will divide the number with 'i' and assign that value back to integer 'number'

Line 13 : Whenever that stage goes out from the second loop, we will decrement 'i' by 1, and start it again until 'i' becomes less than 2

Line 14 -15 : After we break out from both loop, we will check whether the number is equal to 1 or not. If it is, we will print the result backwards.

Line 16-17 : If the number is not equal to 1, the program will then return -1. So it means that there is no such value that can multiply up to get the input value.

2.3 Outputs

```
----- RESTART: /Users/Lily/Desktop/1014 product of digits.py -----
10
25
>>>
----- RESTART: /Users/Lily/Desktop/1014 product of digits.py -----
0
10
>>>
----- RESTART: /Users/Lily/Desktop/1014 product of digits.py -----
1
1
>>>
----- RESTART: /Users/Lily/Desktop/1014 product of digits.py -----
22
-1
>>>
----- RESTART: /Users/Lily/Desktop/1014 product of digits.py -----
36
49
|
```

3. Submission

3.1 Submission result from Timus

ID	Date	Author	Problem	Language	Judgement result	Test #	Execution time	Memory used
7643870	17:13:30 29 Nov 2017	Nafaliesho	1014. Product of Digits	Python 3.6	Accepted		0.093	232 KB
7643869	17:06:38 29 Nov 2017	Nafaliesho	1014. Product of Digits	Python 3.6	Time limit exceeded	4	1.014	1 588 KB

3.2 Submission detail

Language : Python 3.6

Execution time : 0.093

Memory used : 232 KB