

UVA10922

A well-known trick to know if an integer N is a multiple of nine is to compute the sum S of its digits. If S is a multiple of nine, then so is N . This is a recursive test, and the depth of the recursion needed to obtain the answer on N is called the 9-degree of N . Your job is, given a positive number N , determine if it is a multiple of nine and, if it is, its 9-degree.

我們知道要怎麼確定一個整數是不是 9 的倍數 - 如果它每位數的總和是9的倍數，那它就是9的倍數。這種檢驗的方法其實是一種遞迴的方法，而且我們把這種方法遞迴的深度稱作 N 的 9-degree。

你的工作就是，給你一個正整數 N ，判斷他是不是9的倍數，而且如果他是9的倍數你還需要判斷它的 9-degree。

輸入與輸出

3

Input : The input is a file such that each line contains a positive number. A line containing the number 0 is the end of the input. The given numbers can contain up to 1000 digits.

Output : The output of the program shall indicate, for each input number, if it is a multiple of nine, and in case it is, the value of its nine-degree. See the sample output for an example of the expected formatting of the output.

輸入：

輸入含有多組測試資料。每組測試資料一行包含一個正數 N。


當 N=0 時代表輸入結束；輸入的數最大可以到1000位數。

輸出：

對於每一組測試資料，請輸出它是否是 9 的倍數及它的 9-degree。

Step 1：輸入測資

變數	備註
s	輸入的正整數

```
5  
6  string s;  
   while (cin >> s, s != "0") {
```

Step 2：計算總和並判斷是否為9的倍數

變數	備註
s	輸入的正整數
total	每位數的總和
degree	遞迴深度

```
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9
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14

int total=0,degree=1;
for(int i:s)
    total+=i-'0';
if(total%9!=0){
    cout<<"is not a multiple of 9.\n";
    continue;
}
```

Step 3：計算遞迴深度並輸出

變數	備註
s	輸入的正整數
total	每位數的總和
degree	遞迴深度

```
15 while(total!=9){  
16     int t=0;  
17     while (total>0){  
18         t+=total%10;  
19         total/=10;  
20     }  
21     total=t;  
22     degree++;  
23 }  
24 cout<<"is a multiple of 9 and has 9-degree "<<degree<<".\n";
```

完整程式碼

8

```
1  #include<string>
2  #include<iostream>
3  using namespace std;
4  int main(){
5      string s;
6      while(cin>>s,s!="0"){
7          cout<<s<<" ";
8          int total=0,degree=1;
9          for(int i:s)
10             total+=i-'0';
11         if(total%9!=0){
12             cout<<"is not a multiple of 9.\n";
13             continue;
14         }
15         while(total!=9){
16             int t=0;
17             while (total>0){
18                 t+=total%10;
19                 total/=10;
20             }
21             total=t;
22             degree++;
23         }
24         cout<<"is a multiple of 9 and has 9-degree "<<degree<<".\n";
25     }
26 }
```


資料來源

9

英文題目 : <https://vjudge.net/problem/UVA-10922>

中文題目 : <https://zerojudge.tw/ShowProblem?problemid=d672>

THANK YOU