## 1013 Digital Roots

### 一、题目

#### 问题描述

The digital root of a positive integer is found by summing the digits of the integer. If the resulting value is a single digit then that digit is the digital root. If the resulting value contains two or more digits, those digits are summed and the process is repeated. This is continued as long as necessary to obtain a single digit.

For example, consider the positive integer 24. Adding the 2 and the 4 yields a value of 6. Since 6 is a single digit, 6 is the digital root of 24. Now consider the positive integer 39. Adding the 3 and the 9 yields 12. Since 12 is not a single digit, the process must be repeated. Adding the 1 and the 2 yeilds 3, a single digit and also the digital root of 39.

#### 输入数据

The input file will contain a list of positive integers, one per line. The end of the input will be indicated by an integer value of zero.

#### 输出数据

For each integer in the input, output its digital root on a separate line of the output.

#### 输入样例

24 39 0

#### 输出样例

6 3

#### 题目来源

HDU 1013 http://acm.hdu.edu.cn/showproblem.php?pid=1013

### 二、题解

#### 解题思路

题目大意是给定一个整数，求该整数的数字根。当输入为0时停止程序。

数字根的定义是：将输入的整数各个位上的数相加，若所得数小于10则输出，否则将所得数的各位继续相加，直至所得数小于10。

需要注意的是，输入的整数可能不在int范围内，甚至不在long范围内，所以用字符串来处理会比较得当。

用数组储存输入的字符串后，用strlen函数来计算字符串的长度，然后写一个循环，把各个位数的上数字相加。（因数组里储存的数据是char类型，所以要减去’0’得到真正的数字）。

最后相加完后再来判断和是否大于等于10，把和拿来再一次循环，直至最后所得数小于10.

#### 参考程序

#include <stdio.h>  
#include <string.h>  
int main()  
{  
 char a[10000];  
 while(scanf("%s",a)!=EOF)  
 {  
 if(a[0]=='0') break;  
 int l,i,sum=0,sum2=0;  
 l=strlen(a);  
  
 for(i=0;i<l;i++)  
 {  
 sum+=a[i]-'0';  
 }  
   
 if (sum<10)  
 {  
 printf("%d\\n",sum);  
 }  
 else  
 {  
 while(sum>=10)  
 {  
 sum2=0;  
 while(sum!=0)  
 {  
 sum2+=sum%10;  
 sum=sum/10;   
 }  
 sum=sum2;  
 }   
 printf("%d\n",sum);  
 }  
 memset(a,0,sizeof(a));  
 }  
 return 0;  
}

#### 复杂度分析

无

#### 编程技巧

无