## 1058 Digital Roots

### 一、题目

#### 问题描述

A number whose only prime factors are 2,3,5 or 7 is called a humble number. The sequence 1, 2, 3, 4, 5, 6, 7, 8, 9, 10, 12, 14, 15, 16, 18, 20, 21, 24, 25, 27, … shows the first 20 humble numbers.

Write a program to find and print the nth element in this sequence

#### 输入数据

The input consists of one or more test cases. Each test case consists of one integer n with 1 <= n <= 5842. Input is terminated by a value of zero (0) for n.

#### 输出数据

For each test case, print one line saying “The nth humble number is number.”. Depending on the value of n, the correct suffix “st”, “nd”, “rd”, or “th” for the ordinal number nth has to be used like it is shown in the sample output.

#### 输入样例

1 2 3 4 11 12 13 21 22 23 100 1000 5842 0

#### 输出样例

The 1st humble number is 1. The 2nd humble number is 2. The 3rd humble number is 3. The 4th humble number is 4. The 11th humble number is 12. The 12th humble number is 14. The 13th humble number is 15. The 21st humble number is 28. The 22nd humble number is 30. The 23rd humble number is 32. The 100th humble number is 450. The 1000th humble number is 385875. The 5842nd humble number is 2000000000.

#### 题目来源

HDU 1058 http://acm.hdu.edu.cn/showproblem.php?pid=1058

### 二、题解

#### 解题思路

是用2，3，5，7循环来，求第i个f[i],第i个f[i]必定等于前i-1个数中其中一个数与｛2，3，5，7｝中，其中一个的乘积，于是答案就出来了,就是取从1开始取与2,3,5,7相乘，去最小的，取了一个对应指针就往前移一位。

#### 参考程序

#include<stdio.h>  
int main()  
{  
 int i,a,t,k,p2=0,p3=0,p5=0,p7=0;  
 int x[5842]={1};  
 for(i=1;i<5842;)  
 {  
 x[i]=2\*x[p2]>3\*x[p3]?(3\*x[p3]):(2\*x[p2]);  
 x[i]=x[i]>5\*x[p5]?(5\*x[p5]):x[i];  
 x[i]=x[i]>7\*x[p7]?(7\*x[p7]):x[i];  
 if(x[i]==2\*x[p2])  
 p2++;  
 if(x[i]==3\*x[p3])  
 p3++;  
 if(x[i]==5\*x[p5])  
 p5++;  
 if(x[i]==7\*x[p7])  
 p7++;  
 i++;  
 }  
 while(scanf("%d",&a)&&a!=0)  
 {  
 t=a;  
 t=t%100;  
 if(t<14&&t>10)  
 {  
 t=t+5;  
 t=t%10;  
 }  
 else  
 {  
 t=t%10;  
 }  
 if(t==1)  
 printf("The %dst humble number is %d.\n",a,x[a-1]);  
 else if(t==2)  
 printf("The %dnd humble number is %d.\n",a,x[a-1]);  
 else if(t==3)  
 printf("The %drd humble number is %d.\n",a,x[a-1]);  
 else  
 printf("The %dth humble number is %d.\n",a,x[a-1]);  
  
 }  
  
 return 0;  
  
}

#### 复杂度分析

无

#### 编程技巧

无