ccu13a03: Cycle length in decimal expansion
time limit: 1 sec

Problem Description
Given integers p<=q in which p>=0 and q>0, find the cycle length in the decimal expansion of p/q. For example, 1/7=0.142857142857…, the cycle length is six; and 1/3=0.333…, so the cycle length is one. Note that 1/2=0.5 which can also be expressed as 0.500…, and we assume the length is one.

Input
The input consists of several cases. Each case contains two integers p and q in one line. We assume that 0<=p<=q<=1000100.
The case with q=0 ends the input, and you don't need to compute this case.

Output
For each case, print the cycle length in one line.

Sample Input
1 7
2 3
1 1
2 0

Sample Output
6
1
1

Solution
如果會做請先不要看次頁解答

Solution

題意: 求有理數化小數十的循環節長度
題型: simulation:
模擬的題目通常是要你以程式模擬某個動作，大多數的題目並不難，在模擬過程中必須記錄某些值，常運用到陣列

本題你可以模擬人在做除法運算時的動作
每次將餘數乘以 10 在求餘數
何時循環? 當餘數重複時就表示循環了

如何記錄餘數
直覺方法一: 以一個陣列 book[i]記錄下第 i 次的餘數
缺點: 要每次掃描 book[1]到 book[i]，當循環節很大時會花很多時間 O(n^2)

方法二: 以一個陣列 book[i]記錄下 i 這個餘數在第幾次出現
因為餘數必定 0~n-1
Initial set book[i]=0 for all i
檢查餘數只要檢查 book[i]是否等於 0

```
for (i=0;i<m;i++) book[i]=0;
for (i=1;;i++) {
    if (book[n]>0) break;
    book[n]=i;
    n=(n*10)%m;
}
```

這種轉換紀錄對象的手法經常使用，請大家多多了解。

記憶體問題：
宣告 int book[1000100];
可能會有陣列太大的問題，有兩個方法可以獲得更大記憶體
(1)用 malloc

```
int *book;
book=malloc(sizeof(int)*1000100);
```

(2) global variable.