NPTEL (https://swayam.gov.in/explorer?ncCode=NPTEL) » Introduction to Programming in C (course)

Announcements (announcements)

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Progress (student/home)   Mentor (student/mentor)

A6-Q3

Due on 2019-09-14, 23:59 IST
In this question, you are given two positive integers $M$ and $N$, where $M < N$. You may assume that $N$ is less than or equal to 100.

The orbit of $M$ with respect to $N$ is defined to be the sequence:

$M, (2*M) \mod N, (2^2*M) \mod N, \ldots$

There are at most $N$ elements in the sequence, but for some $M$, the number of elements in this sequence may be fewer.

You have to output the maximum number of distinct integers in the orbit of $M$.

For example, if $M=5$ and $N=8$, then the orbit of 5 with respect to 8 is:

$5, 2*5 \mod 8, 4*5 \mod 8, 8*5 \mod 8$

which is equal to:

$5, 2, 4, 0.$

Hence the number of distinct integers in the orbit of 5 is 4.

### Sample Test Cases

<table>
<thead>
<tr>
<th></th>
<th>Input</th>
<th>Output</th>
</tr>
</thead>
<tbody>
<tr>
<td>Test Case 1</td>
<td>2 5</td>
<td>4</td>
</tr>
<tr>
<td>Test Case 2</td>
<td>4 6</td>
<td>2</td>
</tr>
<tr>
<td>Test Case 3</td>
<td>5 8</td>
<td>4</td>
</tr>
</tbody>
</table>

The due date for submitting this assignment has passed.
As per our records you have not submitted this assignment.
Sample solutions (Provided by instructor):

```c
#include <stdio.h>

int orbit[100];
```
```c
void initialize()
{
    int i;
    for (i=0; i<100; i++){
        orbit[i] = -1;
    }
    return;
}

int main()
{
    int m;
    int n;
    int orbit_length=0;
    int current;
    scanf("%d", &m);
    scanf("%d", &n);
    initialize();
    current=m;
    while(orbit[current]== -1){
        orbit[current]=1;
        orbit_length++;
        current = (current * 2) % n;
    }
    printf("%d\n", orbit_length);
    return 0;
}
```