
P0017. Siracusa attacks again

P14410_en

Being n a natural number greater than zero. Consider this algorithm:

- If $n = 1$, stop.
- If n is an even number, divide it by 2.
- If n is an odd number, multiply it by 3 and add 1.

For instance, starting with 6 we obtain $6 \rightarrow 3 \rightarrow 10 \rightarrow 5 \rightarrow 16 \rightarrow 8 \rightarrow 4 \rightarrow 2 \rightarrow 1$.

The conjecture $3n + 1$ says that starting with any natural number $n > 0$, it always arrives to 1. Although it has not still been proved, using computers we know that is true for numbers $n \leq 4035225266123964416$.

Your task is to write a program that reads two natural numbers m and p and prints which natural numbers between 1 and m arrive to 1 in p or more steps. It must print also which is the greatest number contained in their steps.

Your program must implement and use the procedure

```
void converge(int n, int& k, int& far);
```

that, given an integer strictly positive n , stores at the parameter k the number of steps that needs n to arrive to 1, and at the parameter far the greatest number seen in the process. For instance, `converge(6, k, far);` stores an 8 at k and a 16 at far . Similarly, `converge(4, k, far);` stores a 2 at k and a 4 at far , and `converge(1, k, far);` stores a 0 at k and an 1 at far .

Input

The input is two natural numbers m and p , with $1 \leq m \leq 50000$.

Output

Your program must print all the numbers between 1 and m that arrive to 1 in p or more steps, one per line. Besides, print also the greatest produced number, following the format of the instances.

Sample input 1

6 7

Sample input 2

16 0

Sample input 3

1 0

Sample input 4

2 1

Sample input 5

30 200

Sample input 6

50000 323

Sample input 7

447 140

Problem information

Author : Professorat de P1
Translator : Carlos Molina
Generation : 2013-09-02 15:13:46

© *Jutge.org*, 2006–2013.
<http://www.jutge.org>

Sample output 1

3
6
The greatest reached number is 16.

Sample output 2

1
2
3
4
5
6
7
8
9
10
11
12
13
14
15
16
The greatest reached number is 160.

Sample output 3

1
The greatest reached number is 1.

Sample output 4

2
The greatest reached number is 2.

Sample output 5

The greatest reached number is 9232.

Sample output 6

35655
The greatest reached number is 121012864.

Sample output 7

327
The greatest reached number is 39364.