Collatz it up!

ZPRAC-16-17-LabExam-1_Session-1

[15 marks]

Collatz conjecture is a famous conjecture which has troubled mathematicians since 1930s. The conjecture says if a_0 is a positive number and you find a sequence $\{a_i\}$ given by :

$a_{i+1}=a_i2$ if a_i is an even number
$a_{i+1}=3*a_i+1$ otherwise

Then you reach 1 for some i.

Although this conjecture has not been proved or disproved, you are going to have fun playing with this sequence. Let us define $f(a_0)$ as the smallest i such that $a_i=1$ for that a_0. Your job is to calculate $f(a_0)$ for given a_0

 Input:
The first line contains a line T, denoting the number of a_0s for which you have to calculate $f(a_0)$. It is followed by T lines, with an integer a_0 in each line.

Output
Output contains T lines, containing $f(a_0)$ for the corresponding a_0.

Constraints and Assumptions:
$1 \leq T \leq 1000$
$1 \leq a_0 \leq 10^6$ and $a_i \leq 10^9$ for all i $\leq f(a_0)$
All the the sequeces indeed reach 1 and $f(a_0) \leq 500$ for all the inputs.

Example:
Input:
2
4
5

Output:
2
5

Explanation:
i) For $a_0=4$, we get the sequene 4,2,1 hence $f(a_0)=2$.
ii) For $a_0=5$, we get the sequene 5,16,8,4,2,1 hence $f(a_0)=5$.