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A5-Q1

Due on 2019-09-07, 23:59 IST

The Collatz function is defined for a positive integer n as follows.
f(n) = 3n+1 if n is odd
n/2 if n is even

We consider the repeated application of the Collatz function starting with a given integer n, as follows:
f(n), f(f(n)), f(f(f(n))), …

It is conjectured that no matter which positive integer n you start from, this sequence eventually will have 1 in it. It has been verified to hold for numbers up to 5×2^{60} [Wikipedia: Collatz Conjecture].

e.g. If n=7, the sequence is

1. f(7) = 22
2. f(f(7)) = f(22) = 11
3. f(11) = 34
4. f(34) = 17
5. f(17) = 52
6. f(52) = 26
7. f(26) = 13
8. f(13) = 40
9. f(40) = 20
10. f(20) = 10
11. f(10) = 5
12. f(5) = 16
13. f(16) = 8
14. f(8) = 4
15. f(4) = 2
16. f(2) = 1

Thus if you start from n=7, you need to apply f 16 times in order to first get 1.

In this question, you will be given a positive number <= 32,000. You have to output how many times f has to be applied repeatedly in order to first reach 1.

Sample Test Cases

	Input	Output
Test Case 1	101	25
Test Case 2	100	25
Test Case 3	2463	208
Test Case 4	1	0
Test Case 5	7	16

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

```
#include <stdio.h>
#include <limits.h>

int collatz_repeat(int n)
```

```
{
    if ( n == 1 ) {
        return 0;
    }else{
        if ( n % 2 == 1 ) {
            return 1 + collatz_repeat(3*n+1);
        }else{
            return 1 + collatz_repeat(n/2);
        }
    }
}


int main()
{
    int n;
    scanf("%d",&n);
    printf("%d\n", collatz_repeat(n));
    return 0;
}

```