Some algorithms are hard to determine the number of iterations they could be run. For example, consider the following algorithm:

1. Input x
2. While x is not equal to 1
3. If x is even then $x = \frac{x}{2}$
4. If x is odd then $x = 3x + 1$
5. End While

Your goal is to write a program to determine the number of iterations for each input x, and record the sequence of x.

Input

The input has several cases and ends with EOF. Each case contains one integer, which denotes the value x.

Output

For each case, output the sequence of x and determine the maximum number of iterations as the format shown in the sample output. Two consecutive cases should be separated by a blank line.

Sample Input

```
6
8
```

Sample Output

```
Case 1:
Iteration 1: 6
Iteration 2: 3
Iteration 3: 10
Iteration 4: 5
Iteration 5: 16
Iteration 6: 8
Iteration 7: 4
Iteration 8: 2
Iteration 9: 1
The number of iterations is 9.

Case 2:
Iteration 1: 8
Iteration 2: 4
Iteration 3: 2
Iteration 4: 1
The number of iterations is 4.
```