Let's play a number game. We start with $N = 0$, and we want to make $N = a$ given integer S.

Only **three** types of operations are allowed:

1. `INC` : increment N by 1, i.e. $N \leftarrow N + 1$
2. `DEC` : decrement N by 1, i.e. $N \leftarrow N - 1$
3. `DBL` : double N, i.e. $N \leftarrow 2N$

Of course we want to make $N = S$ with the minimum number of operations. Consider an example: Let $S = 7$. Then only 5 steps are required, for instance:

1. `INC` : $N = 0 + 1 = 1$
2. `INC` : $N = 1 + 1 = 2$
3. `DBL` : $N = 2 \times 2 = 4$
4. `DBL` : $N = 2 \times 4 = 8$
5. `DEC` : $N = 8 - 1 = 7 \leftarrow$ DONE!!

Input

Input contains no more than 200 lines. Each line contains one integer S ($0 \leq S \leq 2^{31}$). Input is terminated by EOF.

Output

For each S, output the minimum number of operations required to make $N = S$. You may assume that N is of infinite precision, so NO overflow will ever occur.

Sample Input

```
7
```

Sample Output

```
5
```