Problem A. Boxes and Balls

Little Tom's friend Jack just showed him a great magic trick. At the beginning of the trick, there is one box on the ground with some number of balls in it. Jack then performs this operation over and over again:

1. put a new empty box down on the ground
2. move one ball from each other box into that new empty box
3. remove any boxes that are now empty
4. sort the boxes in nondecreasing order by the number of balls in them

Tom noticed that it is possible for this operation to leave the state of the boxes and balls unchanged! For example:

- Suppose that at the beginning of the trick, the one box contains 3 balls.
- In the first operation, Jack adds a new empty box, puts 1 ball from the existing box into it, and sorts the boxes, so after that operation, there will be 2 boxes on the ground, one with 1 ball and one with 2 balls.
- In the second operation, Jack adds a new empty box and puts 1 ball from each of the existing 2 boxes into it; this creates one empty box, which Jack removes, and then he sorts the boxes. So there are 2 boxes on the ground, one with 1 ball and one with 2 balls. But this is exactly the state that was present before the second operation!

Tom thought about the trick some more, and realized that for some numbers of balls, it is not possible for the operation to leave the state unchanged. For example, if there are 2 balls at the beginning, then after one operation, there will be two boxes with 1 ball each, and after 2 operations, there will be one box with 2 balls, and so on, alternating between these two states forever.

Tom looked around in his room and found infinitely many empty boxes, but only N balls. What is the maximum number of those balls that he could use to perform this trick, such that one operation leaves the state unchanged?

Input

The first line of the input gives the number of test cases, T. T lines follow.

Each line consist of one integer N, the number of balls Tom could find.

Output

For each test case, output one line containing "`Case #x: y`", where `x` is the test case number (starting from 1) and `y` is the maximum number of balls that Tom could use to perform the trick, as described above.

Limits

- $1 \leq T \leq 100$.
- $1 \leq N \leq 10^{18}$.

Sample input and output

Sample Input	Sample Output
3 1 2 3	Case #1: 1 Case #2: 1 Case #3: 3

Note

The trick can be performed with 1 ball or 3 balls, but not with 2 balls. So, for Case #2, Tom can use at most 1 of the 2 balls.