Sky_miner and Odious Number

Description

Sky_miner decides to BG all the members of BG Zhejiang University ACM-ICPC Team. At the same time, he came up with a problem. If you can solve this problem, you can eat one more BG by sky_miner.
The problem is about the Odious Number, of which the definition is given below:
An Odious Number is a number whose binary representation contains an odd number of '1'.
For instance, 10 = $(1010)_2$ with 2 '1's in its binary representation so it's not an odious number; meanwhile, 7 = $(111)_2$ with 3 '1's in its binary representation so it's an odious number.
Please find the i-th odious number so that you can baipiao one more BG.

Input

The input will consist of multiple cases.
The first line will contain a single integer T($T \leq 100$), indicating the number of cases.
For the next T lines, each line contains one interger N.($1 \leq N \leq$ 1e18)

Output

For each case, output one integer in a separate line, indicating the *N-th* odious number.

Sample Input

2
2
3

Sample Output

2
4