

Huseyn and his game

Once our hero Huseyn invited Ziya the ProGammer ProGamer to play his new game with him. Ziya has a great prestige in the gamers area, so he must win the game or ignore the invitation to save his reputation. The rules of the game are not difficult:

- Initially, there are **N** stones on the table. Huseyn will start the game and they will play alternatively.
- Each turn consisting of replacing the number of stones **n** on the table with **n-1** or **$\lfloor (n+1)/2 \rfloor$** . Here $\lfloor \cdot \rfloor$ is floor function.
- The player who makes **1** stone remain wins.

As Ziya is busy with playing games (you know, he can't pause online games :P) you need to make an honest decision for him.

Input

There will be multiple test cases. The first line of the input consisting of the number of the test cases - **T** ($1 \leq T \leq 10000$). For each test case, there will be only one line donating single integer - **N** ($1 \leq N \leq 10^{18}$).

Output

For each test case, print "ZiYES" if Ziya can win the game without matter of the Huseyn's moves, "HuseyNO" otherwise.

Example

Input:

3
1
2
3

Output:

HuseyNO
HuseyNO
ZiYES