

Problem Description

Si Jie the mugger was playing a game with his 2D girlfriend (a.k.a. anime character) after a long day of getting WA for contests. He is fed up and wants to win in this game.

This is a game of Nim, and the game is played this way:

1. The game first starts with a pile of N CP3 books. (Yes that's why Dr Halim manages to sell so many books).
2. Si Jie's 2D girlfriend allows him to always start first, and turns alternate between Si Jie and the 2D character.
3. You must pick at least 1 book, and at most 3 books to read each turn.
4. The person who reads the last book wins.

You are supposed to help Si Jie win the game and tell him the results. Being an AI, Si Jie's 2D girlfriend will always play optimally, so Si Jie is counting on you to try your best. Even though it may not be possible to win all games, you should nevertheless try your best and tell Si Jie the results of the game.

To help you, Si Jie has coded some functions, so that you don't have to manually pick up the books each time. Beware though, Si Jie often receives WA verdicts (joking, the functions are guaranteed to work perfectly – Si Jie gets more AC than WA because he doesn't like to attempt problems that he doesn't know how to do).

Your program is provided with the following function:

1. `int pick (int P)`, which simulates you picking up P books. The AI would then pick and return C , the number of books remaining in the pile. If you picked the last book, this function would return -1 . If AI picked the last book, this function would return 0 .
You are not allowed to pick less than 1 book, or more than 3 books, otherwise you will be considered to have cheated and disconnected from the game. If you tried to pick more books than there are available, you will similarly be disconnected.
2. `void answer (bool S)`, which returns whether Si Jie has won the game. (i.e. If Si Jie wins the game, call `answer(true)`. If Si Jie loses, call `answer(false)`).

You should implement the following functions in your program:

1. `void win(int N)`, which is called at the very beginning of the game with N number of books in the pile.

Scoring

If your answer is incorrect (e.g. Si Jie could have won if he played it correctly but you insisted that Si Jie will lose no matter what OR if Si Jie would never be able to win yet you magically made him win) – you receive a WA verdict / 0 marks.

If your answer is correct, your score is based on T , the number of times you call `pick(int P)`. Your score is calculated by $(1 - (T-50)/(N/4)) * 100$. If you called `pick` ≤ 50 times, you receive 100 marks. If you called `pick` more than $(N/4)$ times, you receive 0 marks (with an additional punch from Si Jie for hogging the computer for so long).

Your overall score for the subtask is the lowest score of all the testcases. (Minimum scoring)

Limits

For all subtasks, $0 < N \leq 1\,000\,000$.

Subtask 1 (5 marks): $N = 1, 2$ or 3 .

Subtask 2 (25 marks): $N \leq 150$, so it's guaranteed that you will be able to solve the problem with less than 50 calls.

Subtask 3 (40 marks): $N \leq 100\,000$.

Subtask 4 (30 marks): No restrictions.

Sample Input

```
pick(298);
```

Sample Output

```
answer(1);
```

Sample Output Explanation

The program should call `answer(1)`, indicating that Si Jie has won the game. The answer can be derived by simply simulating the game.