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Badge Progress (Details)

Points: 126   Rank: 270332

Alice and Bob's Silly Game 🔖

by raman_1729

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Alice and Bob invented the following silly game:

- The game starts with an integer, n, that's used to build a *set* of n distinct integers in the inclusive range from 1 to n (i.e., $set = \{1, 2, 3, \ldots, n-1, n\}$).

- Alice always plays first, and the two players move in alternating turns.

- During each move, the current player chooses a prime number, p, from *set*. The player then removes p and all of its multiples from *set*.

- The first player to be unable to make a move loses the game.

Alice and Bob play g games. Given the value of n for each game, print the name of the game's winner on a new line. If Alice wins, print `Alice`; otherwise, print `Bob`.

Note: Each player always plays optimally, meaning they will not make a move that causes them to lose the game if some better, winning move exists.

Input Format

The first line contains an integer, g, denoting the number of games Alice and Bob play.
Each line i of the g subsequent lines contains a single integer, n, describing a game.

Constraints

- $1 \leq g \leq 1000$
- $1 \leq n \leq 10^5$

Subtasks

- $1 \leq n \leq 1000$ for 50% of the maximum score

Output Format

For each game, print the name of the winner on a new line. If Alice wins, print `Alice`; otherwise, print `Bob`.

Sample Input 0

```
3
1
2
5
```

Sample Output 0

```
Bob
Alice
Alice
```

Explanation 0

Alice and Bob play the following $g = 3$ games:

1. We are given $n = 1$, so $set = \{1\}$. Because Alice has no valid moves (there are no prime numbers in the set), she loses the game. Thus, we print `Bob` on a new line.

2. We are given $n = 2$, so $set = \{1, 2\}$. Alice chooses the prime number $p = 2$ and deletes it from the set, which becomes $set = \{1\}$. Because Bob has no valid moves (there are no prime numbers in the set), he loses the game. Thus, we print `Alice` on a new line.

3. We are given $n = 5$, so $set = \{1, 2, 3, 4, 5\}$. Alice chooses the prime number $p = 2$ and deletes the numbers 2 and 4 from the set, which becomes $set = \{1, 3, 5\}$. Now there are two primes left, 3 and 5. Bob can remove either prime from the set, and then Alice can remove the remaining prime. Because Bob is left without a final move, Alice will always win. Thus, we print `Alice` on a new line.

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Submissions: 1633

Max Score: 30
Difficulty: Medium

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More

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```java
1  import java.io.*;
2  import java.util.*;
3  import java.text.*;
4  import java.math.*;
5  import java.util.regex.*;
6
7  public class Solution {
8
9      public static void main(String[] args) {
10         Scanner in = new Scanner(System.in);
11         int g = in.nextInt();
12         for(int a0 = 0; a0 < g; a0++){
13             int n = in.nextInt();
14             // your code goes here
15         }
16     }
17 }
18
```

Line: 1 Col: 1

⬆ Upload Code as File   ☐ Test against custom input   Run Code   Submit Code

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