Stone Division

by zemen

Problem Submissions Leaderboard Discussions Editorial

Consider the following game:

- There are two players, *First* and *Second*, sitting in front of a pile of n stones. *First* always plays first.
- There is a set, S, of m distinct integers defined as $S = \{s_0, s_1, \ldots, s_{m-1}\}$.
- The players move in alternating turns. During each turn, a player chooses some $s_i \in S$ and splits one of the piles into exactly s_i smaller piles of equal size. If no s_i exists that will split one of the available piles into exactly s_i equal smaller piles, the player loses.
- Both players always play optimally.

Given n, m, and the contents of S, find and print the winner of the game. If *First* wins, print `First`; otherwise, print `Second`.

Input Format

The first line contains two space-separated integers describing the respective values of n (the size of the initial pile) and m (the size of the set).
The second line contains m distinct space-separated integers describing the respective values of $s_0, s_1, \ldots, s_{m-1}$.

Constraints

- $1 \leq n \leq 10^{18}$
- $1 \leq m \leq 10$
- $2 \leq s_i \leq 10^{18}$

Output Format

Print `First` if the *First* player wins the game; otherwise, print `Second`.

Sample Input 0

```
15 3
5 2 3
```

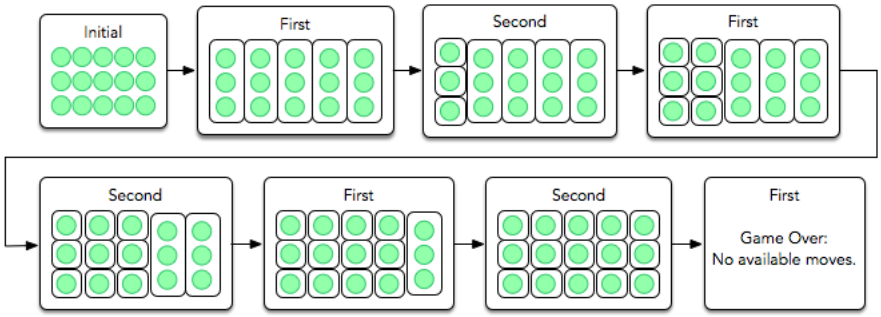
Sample Output 0

```
Second
```

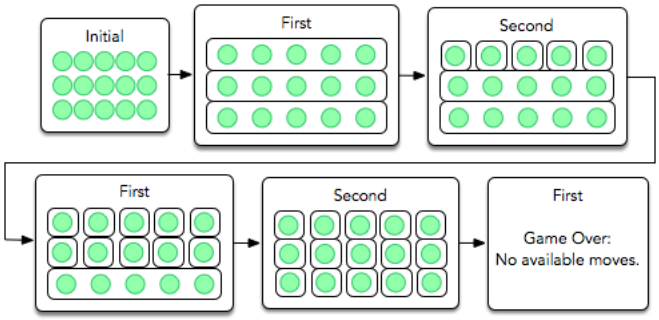
Explanation 0

The initial pile has $n = 15$ stones, and $S = \{5, 2, 3\}$. During *First*'s initial turn, they have two options:

1. Split the initial pile into 5 equal piles, which forces them to lose after the following sequence of turns:



2. Split the initial pile into **3** equal piles, which forces them to lose after the following sequence of turns:



Because *First* never has any possible move that puts them on the path to winning, we print `Second` as our answer.

Submissions:279

Max Score:50

Difficulty: Hard

Rate This Challenge:

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Current Buffer (saved locally, editable) Java 7

```
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         /* Enter your code here. Read input from STDIN. Print output to STDOUT. Your class should be named Solution. */
11     }
12 }
```

Line: 1 Col: 1

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