

C - Remainder Game

Editorial

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Time Limit: 2 sec / Memory Limit: 256 MB

Score : 700 points

Problem Statement

Aoki is playing with a sequence of numbers a_1, a_2, \dots, a_N . Every second, he performs the following operation :

- Choose a positive integer k . For each element v of the sequence v , Aoki may choose to replace v with its remainder when divided by k , or do nothing with v . The cost of this operation is 2^k (regardless of how many elements he changes).

Aoki wants to turn the sequence into b_1, b_2, \dots, b_N (the order of the elements is important). Determine if it is possible for Aoki to perform this task and if yes, find the minimum cost required.

Constraints

- $1 \leq N \leq 50$
- $0 \leq a_i, b_i \leq 50$
- All values in the input are integers.

Input

Input is given from Standard Input in the following format:

```
N
a1 a2 ... aN
b1 b2 ... bN
```

Output

Print the minimum cost required to turn the original sequence into b_1, b_2, \dots, b_N . If the task is impossible, output -1 instead.

Sample Input 1

Copy

```
3
19 10 14
0 3 4
```

Copy

Sample Output 1

Copy

```
160
```

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Here's a possible sequence of operations :

- Choose $k = 7$. Replace 19 with 5, 10 with 3 and do nothing to 14. The sequence is now 5, 3, 14.
- Choose $k = 5$. Replace 5 with 0, do nothing to 3 and replace 14 with 4. The sequence is now 0, 3, 4.

The total cost is $2^7 + 2^5 = 160$.

Sample Input 2

Copy

```
3
19 15 14
0 0 0
```

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Sample Output 2

Copy

```
2
```

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Aoki can just choose $k = 1$ and turn everything into 0. The cost is $2^1 = 2$.

Sample Input 3

Copy

```
2
8 13
5 13
```

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Sample Output 3

Copy

```
-1
```

Copy

The task is impossible because we can never turn 8 into 5 using the given operation.

Sample Input 4

Copy

```
4
2 0 1 8
2 0 1 8
```

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Sample Output 4

Copy

```
0
```

Copy

Aoki doesn't need to do anything here. The cost is 0.

Sample Input 5

Copy

```
1
50
13
```

Copy

Sample Output 5

Copy

```
137438953472
```

Copy

Beware of overflow issues.

Language

C++ (GCC 9.2.1)

Source Code

1

Open File

Toggle Editor

Auto Height

Submit

⌘ at most 512 KiB

⌘ Your source code will be saved as Main.extension.