



Beautiful Quadruples

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Problem

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We call an quadruple of positive integers, (W, X, Y, Z) , *beautiful* if the following condition is true:

$$W \oplus X \oplus Y \oplus Z \neq 0$$

Note: \oplus is the [bitwise XOR](#) operator.

Given A, B, C , and D , count the number of *beautiful* quadruples of the form (W, X, Y, Z) where the following constraints hold:

- $1 \leq W \leq A$
- $1 \leq X \leq B$
- $1 \leq Y \leq C$
- $1 \leq Z \leq D$

When you count the number of *beautiful* quadruples, you should consider two quadruples as same if the following are true:

- They contain same integers.
- Number of times each integers occur in the quadruple is same.

For example $(1, 1, 1, 2)$ and $(1, 1, 2, 1)$ should be considered as same.

Input Format

A single line with four space-separated integers describing the respective values of A, B, C , and D .

Constraints

- $1 \leq A, B, C, D \leq 3000$
- For 50% of the maximum score, $1 \leq A, B, C, D \leq 50$

Output Format

Print the number of *beautiful* quadruples.

Sample Input

```
1 2 3 4
```

Sample Output

```
11
```

Explanation

There are 11 beautiful quadruples for this input:

1. (1, 1, 1, 2)
2. (1, 1, 1, 3)
3. (1, 1, 1, 4)
4. (1, 1, 2, 3)
5. (1, 1, 2, 4)
6. (1, 1, 3, 4)
7. (1, 2, 2, 2)
8. (1, 2, 2, 3)
9. (1, 2, 2, 4)
10. (1, 2, 3, 3)
11. (1, 2, 3, 4)

Thus, we print **11** as our output.

Note that (1, 1, 1, 2) is same as (1, 1, 2, 1).

[f](#) [t](#) [in](#)

Submissions: [835](#)

Max Score: 50

Difficulty: Medium

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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         Scanner in = new Scanner(System.in);
11         int A = in.nextInt();
12         int B = in.nextInt();
13         int C = in.nextInt();
14         int D = in.nextInt();
15     }
16 }
17
```

Line: 1 Col: 1

 [Upload Code as File](#) ☐ Test against custom input

Run Code

Submit Code

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