Contests

Beautiful Quadruples





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Submissions: 678

Difficulty: Moderate

Max Score: 50

More

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

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

Leaderboard

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:

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

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

- $1 \leq A, B, C, D \leq 3000$
- ullet 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
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Sample Gatpa

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).

