

PSH: Spring Cleaning at the Big Bang 1

Every May 5th at precisely 5pm, Sheldon organizes his wardrobe according to very precise standards. He classifies each item of his clothing according to n different criteria, e.g. summer wear, winter wear, theoretical physics wear, Star Trek wear, and so on. Of course, one piece of clothing can be classified according to multiple criteria. However, each item of clothing must fit at least one criterion.

This year, as in every other year, he counted the total items that were classified in each of the n criteria, then he counted the total number of items that fell in each of the distinct combinations of two criteria, followed by the total number of items that fell in each of the distinct combinations of three criteria, and so on, ending with the total number of items that were classified using all criteria.

Your task is to calculate the total number of items of clothing that Sheldon owns.

Input Format

The input begins with an integer $n > 1$ indicating the number of criteria used in Sheldon's classification scheme. This is followed by n integers with total number of items clothing for each of the n criteria.

Next come $(n^2 - n) / 2$ integers with the total number of items of clothing for each of the unique combinations of two criteria. If $n > 2$, the next lines would contain the $(n^3 - 3n^2 + 2n) / 6$ totals for the unique combinations of three criteria. If n is large enough, the next lines would contain the totals for the unique combinations of four criteria, followed by the totals for the unique combinations of five items, and so on, until the last line within would have the total of the items that met all criteria.

Constraints:

$$1 \leq n \leq 20$$

Sheldon has at most 10^{10} items of clothing.

Output Format

Your output is a single number containing the number of items of clothing that Sheldon owns. Note that your program should return a 0 to the operating system.

Sample Input

```
2
3
3
2
```

Sample Output

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4
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Explanation

Sheldon uses two criteria in this case.

The first criteria applies to 3 items. The second applies to 3 items. However, there is overlap because both criteria apply to 2 items.

Given this overlap, you can conclude that Sheldon classified 4 items of clothing.