Problem 1: she shells book shelves by the she shelf
3 Point(s)

Problem ID: `bookshelf`
Rank: `1`

Introduction

Your graduate "degree" in bookshelves from bookshelf school has finally paid off! After years of toiling over mortise joint design, applying for marquetry internships, and practicing wood impregnation techniques, you're finally working your dream job at JKEA, where you've been spending your days designing premier wooden bookshelves for clients.

There's just one problem: your trusty look-at-it-and-wing-it approach for estimating material costs has led to exorbitant receipts and unhappy customers! After dozens of complaints and multiple lawsuits, your manager has had enough: one more complaint, and you're out of a job. You're already facing a pending fraud investigation into your faked graduate degree, so you need to get your act together—fast!

Problem Statement

You are given a design for a vertical bookshelf made of wooden boards with a thickness of B inches. The design has N vertically-stacked rectangular shelves with boards on each side, with adjacent shelves sharing the same board. The shelves are all W inches wide (not including the boards) and have heights given by the sequence H_1, H_2, …, H_N, in inches. The bookshelf also has a depth of D inches but no front or back. Given this design, find the total volume of wood needed to construct the bookshelf, in cubic inches.

*Note: This problem—alongside **all other problems in this contest**—has templates available in Python, Java, and C++! You can find them in the [contest.zip provided at the start of the contest](). Templates parse the input into a neat function to fill out, so you can jump right into problem solving!*
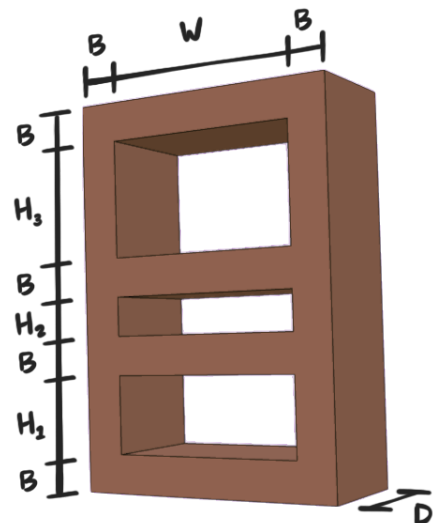
Input Format

The first line of the input contains an integer T denoting the number of test cases that follow.
For each test case:

- The first line contains four space-separated integers N B W D where:
  - N denotes the number of shelves in the bookshelf.
  - B denotes the thickness of the boards, in inches.
  - W denotes the width of the shelves, in inches.
  - D denotes the depth of the bookshelf, in inches.
- The second line contains a space-separated sequence of N integers H_1, H_2, …, H_N denoting the height of each of the bookshelf's shelves, in inches.

Output Format

For each test case, output a single line containing the total volume of wood needed to construct the bookshelf, in cubic inches.

Constraints

$1 \le T \le 100$
$1 \le N, B, W, D \le 50$
$1 \le H_i \le 50$

Sample Test Cases

Sample Input

```
3
3 1 5 3
2 1 3
5 2 20 15
3 3 9 1 21
1 3 1 1
5
```
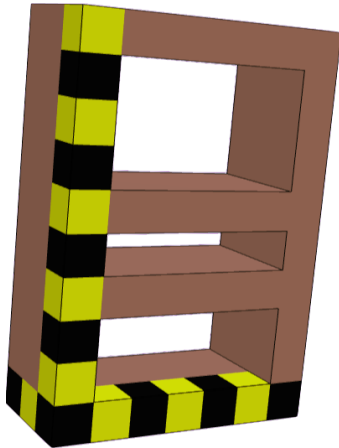
## Sample Output

```
120
6540
72
```

Sample Explanations

Test Case #1:
The bookshelf described looks like this, and has a total volume of 120 cubic inches. The left and right sides of the bookshelf each contribute 1 × 10 × 3 = 30 cubic inches of volume, and each horizontal board contributes 5 × 1 × 3 = 15 cubic inches of volume. 2 × 30 + 4 × 15 = 120 cubic inches of volume total.
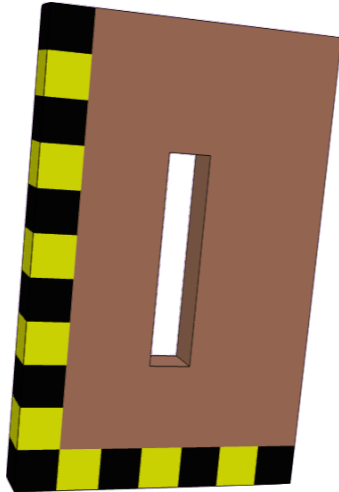
Note that while the width of each shelf **W** is 5 inches, the width of the entire bookshelf is actually 7 inches.
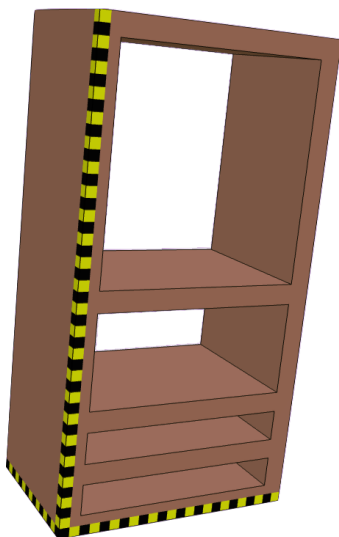
Test Case #2:
The bookshelf described looks like this, and has a total volume of 6540 cubic inches.

Although this bookshelf seems much larger than the other two samples provided, it would actually only be just over 4 feet (1.2 meters) tall!

Test Case #3:

The bookshelf described looks like this, and has a total volume of 72 cubic inches. Note how boards of thickness $B = 3$ surround the only shelf on all sides.

Admittedly, the bookshelf only having a depth of $D = 1$ makes this more of a door than a proper bookshelf.