Problem 208: Are We on Budget?

Difficulty: Medium

Author: Sowmya Chandrasekaran, Sunnyvale, California, United States

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Problem Background

Earned Value Management (EVM) is a program management technique used by the Department of Defense, and therefore defense companies, to provide situational awareness of program status and to assess cost, schedule, and technical performance of programs. Lockheed Martin's Finance and Business Operations team works closely with technical groups to accurately predict monthly costs and schedules, and conduct analyses each month to showcase to stakeholders how accurate their predictions were. Essentially, this system helps a program's stakeholders understand how money and time are being spent - this is especially important since a single spacecraft can be worth more than a billion dollars!

Problem Description

One of the metrics that Lockheed Martin tracks is "Cost Variance," the difference between the budgeted cost of an item or task and the actual cost incurred. If this variance is equal to 0, that means that the prediction was exactly correct, and the project is on budget. For example, if a program expected to spend $1000.00 but only spent $900.00, it has a cost variance of -$100.00; it was under budget. In order to provide a better overview of the program, cost variances are usually calculated according to individual line items (software development, systems engineering, purchasing parts, etc.) and then those variances are averaged for presentation to stakeholders.

Your team will be given a list of cost estimates and a list of the corresponding actual costs for a program during the previous month. You'll need to write a program that calculates the average cost variance for that month.

Sample Input

The first line of your program's input, **received from the standard input channel**, will contain a positive integer representing the number of test cases. Each test case will include:

- A line containing a single integer, **N**, representing the number of line items in the monthly budget.
- A line containing **N** decimal values, separated by spaces, each representing the budgeted amount for a line item in the program's overall budget.

- A line containing N decimal values, separated by spaces, each representing the actual cost for each line item in the program's budget. Each value in this list corresponds with the same-indexed item in the previous list.

```
2
6
123.45 678.90 1234.56 789.01 2345.67 8901.23
321.54 876.09 1432.65 987.10 2543.76 8109.32
6
250.00 349.99 150.45 782.15 650.00 99.99
225.16 299.99 160.14 798.16 650.00 75.00
```

Sample Output

For each test case, your program must calculate the cost variance for each line item, then print out a single line with the average cost variance across all line items. Round your result to two decimal places and include any trailing zeroes.

```
32.94
-12.36
```