Area Under Curves and Volume of Revolving a Curve ■



ubmissions Leaderboard Discussion

Definite Integrals via Numerical Methods

This relates to definite integration via numerical methods

Consider the algebraic expression given by:

$$(a_1)x^{b_1}+(a_2)x^{b_2}+(a_3)x^{b_3}\ldots\ldots(a_n)x^{b_n}$$

For the purpose of numerical computation, the area under the curve y = f(x) between the limits a and b can be computed by the Limit Definition of a Definite Integral.

Here is some background about areas and volume computation.

Using equal subintervals of length = 0.001, you need to:

- 1. Evaluate the area bounded by a given polynomial function of the kind described above, between the given limits of \boldsymbol{L} and \boldsymbol{R} .
- 2. Evaluate the volume of the solid obtained by revolving this polynomial curve around the \boldsymbol{x} -axis.

An absolute error margin of 0.02 will be tolerated.

Input Format

The first line contains N integers separated by spaces, which are the values of $a_1, a_2, \ldots a_N$.

The second line contains N integers separated by spaces, which are the values of $b_1, b_2 \dots b_N$.

The third line contains two space separated integers, L and R, the lower and upper range limits in which the integration needs to be performed, respectively.

Constraints

$$\begin{array}{l} -1000 <= a <= 1000 \\ -20 <= b <= 20 \\ 1 <= L < R <= 20 \end{array}$$

Output Format

The first line should contain the area between the curve and the æ-axis, bound between the specified limits.

The second line should contain the volume of the solid obtained by rotating the curve around the x-axis, between the specified limits.

Sample Input

Explanation

The algebraic expression represented by:

$${\scriptstyle (1)x^6+(2)x^7+(3)x^8+(4)x^9+(5)x^{10}}$$

We need to find the area of the curve enclosed under this curve, between the limits x = 1 and 4. We also need to find the volume of the solid formed by revolving this curve around the x-axis between the limits x = 1 and 4.

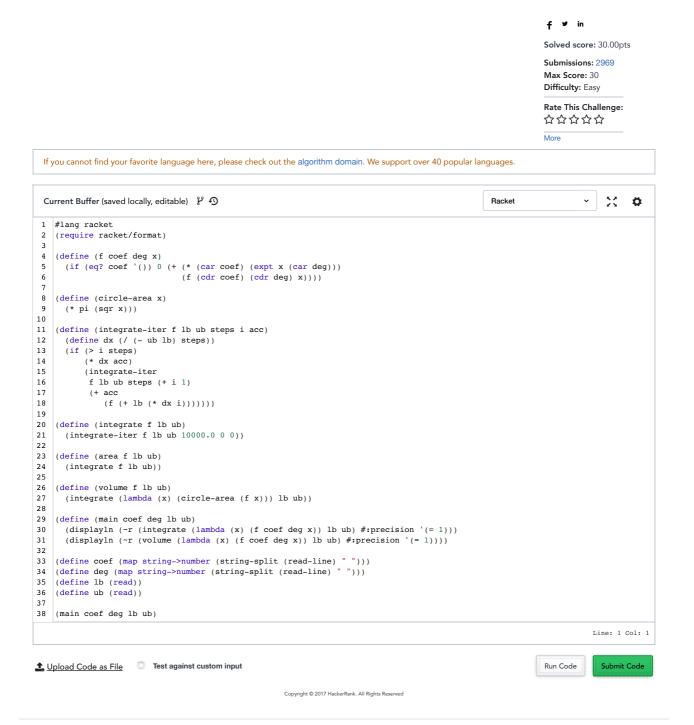
Sample Output

2435300.3 26172951168940.8

Scoring

All test cases are weighted equally. You need to clear all the tests in a test case.

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