

Georgia Tech Code Challenge Practice

Saturday, March 31 2012

Rules and Guidelines

1. There are **three** problems to be completed in **one hour**
2. The input is from standard in and the output is to standard out
3. The allowed programming languages are C, C++, Java and Python
4. Name files (and classes in Java) as A, B or C
5. Maximum number of test cases (T) for all problems is 100
6. Time limit for each problem is 10 seconds (on the judging system)
7. Judges' decisions are to be considered final. No cheating will be tolerated

File	Problem Name	Difficulty
A	Sum	1
B	Area	2
C	Lineland	5

A: Sum

Difficulty: 1

Given a positive integer N , find the sum from 1 to N , inclusive.

Input

The first line contains a single integer T specifying the number of test cases. T lines follow each containing a single integer N .

$$1 \leq N \leq 100$$

Output

For each test case, output a line with the given sum.

Samples

Input	Output
2	10
4	6
3	

B: Area

Difficulty: 2

Given a radius R , compute the area of the circle of radius R .

Input

The first line contains a single integer T specifying the number of test cases. T lines follow each containing a single positive integer R .

$$1 \leq R \leq 100$$

Output

For each test case, output a line with the given area. The area should be rounded to 4 decimal places. You must always print **exactly** 4 decimal places.

Samples

Input	Output
2	3.1416
1	12.5664
2	

C: Lineland

Difficulty: 5

One-dimensional world Lineland is inhabited by lustrous points. Despite being very small in size, they have a rich and diverse culture as well as advanced technology and science. They have answers to many questions about the world, and yet the finiteness of Lineland's universe remains one of the greatest mysteries since the ancient times.

The Limit Expedition, TLE, is a group of scientists and engineers sent towards the Positive Infinity, one of the conjectural ends of the world, to build a new observatory. The observatory is meant to observe quantum fluctuations of a few important places and collect the data for further research on the finiteness of the universe.

TLE hires you to determine the location for the observatory. They provide the coordinates of the important places; and they also want the observatory to be built such that the sum of distances to the important places is minimized. In case there are many acceptable locations for the observatory, provide the location closest to Zero, the capital of Lineland.

Input

The first line contains a single integer T specifying the number of test cases. Each test case begins with an integer N , on a line by itself, ($N < 100,000$) indicating the number of the important places, followed by a line containing N positive integers, which represent the coordinates of the important places. You may assume that the coordinates fit in 32-bit signed integers. The location of the capital is always 0.

Output

For each test case, output a line with the location of the observatory to be built. The location should be rounded to 2 decimal places. You must always print **exactly** 2 decimal places.

Samples

Input	Output
2	1000.00
2	14.00
1000 2000	
3	
10 15 14	