

Calculating Volume

You are given a class *Solution* and its *main* method in the editor. In each test cases, it takes an input *ch* which represents a choice of the following:

- *ch* = 1 represents the volume of a cube that has to be calculated where *a* represents the length of the sides of the cube.
- *ch* = 2 represents the volume of a cuboid that has to be calculated where *l*, *b*, *h* represent the dimensions of a cuboid.
- *ch* = 3 represents the volume of a hemisphere that has to be calculated where *r* represents the radius of a hemisphere.
- *ch* = 4 represents the volume of a cylinder that has to be calculated where *r*, *h* represent the radius and height of the cylinder respectively.

Your task is to create the class *Calculate* and the required methods so that the code prints the volume of the figures rounded to exactly 3 decimal places.

In case any of the *dimensions* of the figures are ≤ 0 , print *"java.lang.NumberFormatException: All the values must be positive"* without quotes and *terminate the program*.

Note: Use `Math.PI` or `3.14159265` as the value of pi.

Input Format

First line contains *T*, the number of test cases. Each test case contains *ch*, representing the choice as given in the problem statement.

- When *ch*=1, Next line contains *a*, length of the sides of the cube.
- When *ch*=2, Next three lines contain *l*, *b*, *h* representing length, breadth and height of the cuboid respectively. *l*, *b*, *h* will be in three separate lines
- When *ch*=3, Next line contains *r*, the radius of the hemisphere
- When *ch*=4, Next two lines contain *r*, *h* representing the radius and height of the cylinder respectively. *r*, *h* will be in two separate lines.

Note: You have to determine the *data type* of each parameter by looking at the code given in the *main* method.

Constraints

$$1 \leq ch \leq 4$$

$$-100 \leq a, l, b, h, r \leq 100$$

There will be at most 3 digits after decimal point in input.

Output Format

For each test case, print the answer rounded up to exactly 3 decimal places in a single line. For example, 1.2345 should be rounded to 1.235, 3.12995 should be rounded to 3.130.

Sample Input 1

```
2
1
4
4
```

```
67.89
-98.54
```

Sample Output 1

```
64.000
java.lang.NumberFormatException: All the values must be positive
```

Explanation

There are two test cases. In the first test case $ch = 1$, means you have to calculate the volume of a cube. The next line contains the $a=4$, means the side of the cube is **4**. So the volume of the cube is **64.000**. In the second test case, you have to calculate volume of a cylinder. But the height of the cylinder is negative, so an exception is thrown.

Sample Input 2

```
1
3
1.02
```

Sample Output 2

```
2.223
```