

# 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 values are  $\leq 0$ , 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
```