8. Mmmmmath

Program Name: math.java Input File: math.in

The mean, or average, of a set of integers is the sum of all the integers of the list divided by the number of integers in the list. For example, the mean of the set {1,1,4,9,9} is (1+1+4+9+9)/5 = 4.8.

The median of a set of integers is the middle value in the set if it were sorted lowest to highest. If there are two middle values (i.e., there are an even amount of integers in the set), then the median is the average of the two middle values. For example, the median of the set {1,1,4,9,9} is 4 and the median of the set {1,1,1,4,9,9} is 2.5 (the average of the two middle values, 1 and 4).

The mode of a set of integers is a set of the elements that occur most often, sorted in ascending order. For example, the mode of the set {1,1,1,4,9,9} is {1} and the mode of the set {1,1,4,9,9} is {1,9}.

The meanode of a set of integers is the mean of its mode. For example, the meanode of the set {1,1,4,9,9} is 5, since the mode of the set is {1,9} and the mean of that set is 5.

The mediode of a set of integers is the median of its mode. For example, the mediode of the set {1,1,4,4,9,9} is 4, since the mode of the set is {1,4,9} and the median of that set is 4.

Note: The terms meanode and mediode are inventions of the authors for the purposes of this problem and are not actual terms.

Input

The first line of the input file will contain a single integer, *n,* indicating the number of sets to analyze.
Each of the following *n* lines will consist of a comma-separated list of integers enclosed in curly braces, as shown in the introduction. Each list will be sorted in ascending order.

Output

For each set of integers, print a single line of the mean, median, mode, meanode, and mediode values, each separated by a single space. Print the mode values in set notation (comma-separated list of integers enclosed in curly braces). Truncate any portions of values beyond two decimal values. (e.g., print 4.16 for a value of 4.16666666).

Example Input File

```
4
{1,1,4,9,9}
{1,1,1,4,9,9}
{1}
{9,9,9,9,9,9,9}
```

Example Output To Screen

```
4.8 4 {1,9} 5 5
4.16 2.5 {1} 1 1
1 1 {1} 1 1
9 9 {9} 9 9
```