Assignment 3

Exercise 1

Describe the parts of this class:

```
public class Cube {
  private double depth = 10;
  private double width = 10;
  private double height = 10;

  private static int numOfCubes = 0;

  public static int getNoOfCubes() {
    return numOfCubes;
  }

  public Cube() {
    numOfCubes++;
  }

  public void scale(double scaling) {
    depth *= scaling;
    width *= scaling;
    height *= scaling;
  }

  public double getVolume() {
    return depth * width * height;
  }

  public double getDepth() {
    return depth;
  }

  public void setDepth(double depth) {
    this.depth = depth;
  }
}
```

Exercise 2

Draw an UML diagram of the previous class.

Exercise 3

Write a program that reads positive numbers until the user inserts a negative one (Note: the negative number does not count).

After having read the number the program should print:

- Their average
- Their minimum and maximum
- Their standard deviation (square root of the sum of the squared differences from the mean divided by total minus 1) https://en.wikipedia.org/wiki/Standard_deviation
- Their median (the value separating the higher half of a data) https://en.wikipedia.org/wiki/Median

Note: for computing the last two statistics you need to store an arbitrary number of number. To do that you will need to implement the `InfinitArray` class.

This class should contain a normal array (`double[]`) as internal storage and provide an `add(double value)` method which insert values inside the storage.

When the storage is full, the add method should create a new storage twice as big and copy all values from the old storage to the new one. The effect will be to have the same value inside the storage but its size will be larger.

You can add other fields (e.g., the current size), getters (e.g., `at(int index)`), or methods (e.g., `sort()`).

Please provide also an UML diagram of your class.

Example:

```
Insert numbers (terminate with negative number):
> 2.1
> 2.6
> 1
> -1

Their average is 1.9
Their min/max is 1.0/2.6
Their standard deviation is 0.6683312551921144
Their median is 2.1
```

Instructions

Please provide the solution to exercises 1 and 2 in a **unique** pdf. The solution of exercise must be provides as a **java** file. The t**wo files must be zipped** together before upload.

Assignment not respecting these instructions will be ignored.