

# COMS 3137 Data Structures and Algorithms.

## Homework 1

Submit your electronic files via <http://courseworks.columbia.edu>. Place your files into a directory named

`<your_uni>_homework1`

and archive your submission folder using the command:

```
tar -czvf uni1234_homework1.tgz uni1234_homework1
```

Upload your archive to the Class Files section of courseworks in the Homework 1 subdirectory. It is also recommended that you keep a pristine copy of your submission folder in case there is any submission error.

### 1 Written Problems

1. Weiss 1.7
2. Weiss 1.12
3. Weiss 2.1
4. Weiss 2.6
5. Weiss 2.10 a, b, or c. Choose whichever you prefer to analyze. But don't do more than one, we'll just grade the first one we see.
6. Weiss 2.27. Pseudocode or even clear, unambiguous English is fine.
7. Weiss 2.30. Pseudocode or even clear, unambiguous English is fine.

## 2 Programming Problems

### 1. Weiss 1.1.

Have your program spit out the running time table in plain text. Here is a simple class to do code timing (you can also write your own if you prefer):

```
public class TimeInterval {
    private long startTime, endTime;
    private long elapsedTime; // Time Interval in milliseconds
// Commands
    public void startTiming() {
        elapsedTime = 0;
        startTime = System.currentTimeMillis();
    }

    public void endTiming() {
        endTime = System.currentTimeMillis();
        elapsedTime = endTime - startTime;
    }

//Queries
    public double getElapsedTime() {
        return (double) elapsedTime / 1000.0;
    }
}
```

### 2. Weiss 2.7.

Treat this problem as a you would a science experiment. Consider your analyses in part (a) your hypotheses and part (b) the experiment. Plot your running times using the Java graph package at <http://www.sci.usq.edu.au/staff/leighb/graph/>.