

# Homework 1

Due Monday, June 23, at 9 AM (GMT-7)

CSc 345 – Summer 2014

Instructor: Qiyam Tung

## Instructions

1. This is an individual assignment. You must do your own work.
2. If you are having difficulty and need to ask a question you can:
  - (a) Ask questions in class.
  - (b) Stop by my office hours (or make an appointment).
  - (c) Post a question on Piazza.
  - (d) Post a private question on Piazza if the question is too specific.
3. Show all work. Incomplete solutions will **not** receive full credit
4. You may write your solutions by hand, or you may type them using any appropriate program such as Microsoft Word, OpenOffice Writer, L<sup>A</sup>T<sub>E</sub>X, etc...  
However, the final copy should be in PDF form and formatted so that it is legible.
5. If the listed problem is only a number, refer to the online book for the description of the problem (starting at page 46).

## Problems (50 points)

1. (5) Step-count the problem in Figure ???. Use the pessimistic (worst case) approach for IF and IF-ELSE statements.

```
min = max = list[0];

for(int i = 1; i < n-1; i+=2){
    if(list[i] < list[i+1]){
        if(list[i] < min)
            min = list[i];
        if(list[i+1] > max)
            max = list[i+1];
    } else {
        if(list[i+1] < min)
            min = list[i+1];
        if(list[i] > max)
            max = list[i];
    }
}

if(i == n-1){
    if(list[i] < min)
        min = list[i];
    if(list[i] > max)
        max = list[i];
}
```

Figure 1: An algorithm for finding min-max value in a list.

2. (5) Question 3.3 (P.85)
3. (8) Question 3.8 (P.85)  
Notes: find the **TIGHTEST** possible bounds
4. (12) Question 3.12 (c) (e) (g) (i) (P.86 - P.87)  
Notes: calculate **Big-O** for these code fragments in the **worst** cases.
5. (10) Question 14.14 (P.481)  
Notes: use Big-O instead of Big-Theta.
6. (10) Question 14.15 (P.481)  
Notes: in addition to the exact solution, also show the asymptotic solution using Big-O notation. And prove your answer is correct.