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, \LaTeX{}, 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 1. Use the pessimistic (worst case) approach for IF and IF-ELSE statements.

   \begin{verbatim}
   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];
   }
\end{verbatim}

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.