EECS 3101 Fall '17: Design and Analysis of Algorithms

Assignment 2

Weight: 4%, Due: Oct 25, in the drop box by 3:45 pm or in class by 4:10 pm

Notes:

1. The assignment can be handwritten or typed. It MUST be legible.
2. You must do this assignment individually.
3. Submit this assignment only if you have read and understood the policy on academic honesty on the course web page. If you have questions or concerns, please contact the instructor.
4. Use the dropbox near the EECS main office to submit your assignments, or bring them to class. No late submissions will be accepted. Please do not send files by email unless you have the instructor's permission to do so.

Problem 1

Prove that the following procedure finds the minimum of n numbers stored in an array correctly. The input specification is that array A contains n positive integers.

```
StrangeMin(A)
 1  n ← length(A)
 2  min1 ← A[2]
 3  min2 ← A[1]
 4  for i ← 2 to ⌊n/2⌋
 5  do if min1 > A[2i]
 6        then min1 ← A[2i]
 7     if min2 > A[2i − 1]
 8        then min2 ← A[2i − 1]
 9  min ← A[n]
10  if min > min2
11     then min ← min2
12  if min > min1
13     then min ← min1
14  return min
```

Problem 2

Solve the following recurrence.

$T(1) = T(2) = 1$, and for $n > 2$, $T(n) = T(n-1) + T(n-2) + 5$.

Hint: Try to convince yourself that the solution is an exponential function in n.