

EECS 336: Design and Analysis of Algorithms Weekly Problem Set #1

Class Homepage: www.cs.northwestern.edu/~kao/eecs336-algorithms/index.htm

Posted on the Class Homepage: Tuesday, September 30, 2014.

Due Time: the start of class on Tuesday, October 7, 2014.

Policy for This Problem Set: Different problem sets may have different policies. This problem set is to be done by one student singly. To answer the questions in this problem set, you may consult your textbook, your lecture notes, the Internet, and any materials that you can find in libraries. You may also discuss solution ideas for these questions with the instructor or the teaching associates, but no one else. You may not copy answers from other people, including those from your fellow students or those posted on the Internet. If you copy all or portions of your answers from other people, you will receive 0 point for the entire problem set. If two students have identical or essentially identical answers but the original sources of the answers cannot be determined, both students will receive 0 point for the entire problem set.

Questions: There are 3 questions.

1. (34 points) Exercise 4.3-9 on page 88. Change the equation to the following. All log functions are base 3.

$$T(n) = 2 \cdot T(n^{1/3}) + 28 \cdot T(n^{1/6}) + (\log n)^2 \cdot (\log \log n)^{1.5} + 10000 \cdot (\log n)^2$$

2. (33 points) Generalize Exercise 9.3-8 on page 223 by changing the input from two arrays X and Y to four arrays A, B, C, and D, each containing n numbers already in sorted order.
3. (33 points) Generalize Exercise 30.1-7 on page 906 by changing the input from two sets A and B to four sets W, X, Y, Z, each having n integers in the range from 0 to 10n.