FALL 2008: **COT 5407** Intro. to Algorithms
[Homework 3; Due Oct 14 at start of class]

General submission guidelines and policies: Add the following signed statement. Without this statement, your homework will not be graded.

> I have adhered to the collaboration policy for this class. In other words, everything written down in this submission is my own work. For problems where I received any help, I have cited the source, and/or named the collaborator.

Read the handout on **Homework guidelines and collaboration policy**.

Problems

16. (**Exercise**) Solve these exercises: Exercise 6.2-1, p132; Exercise 6.3-1, p135; Exercise 6.4-1, p136; Exercise 6.5-1, p140; Exercise 8.2-1, p170; Exercise 8.3-1, p173; Exercise 9.3-3, p192;

17. (**Exercise**) Study Section 6.5 titled "Priority queues" from your text. In particular, study the algorithm MAX-HEAP-INSERT(A, key) that inserts an item with value key into a heap A.

18. (**Regular**) Solve 6.5-2, p140. You may draw the pictures by hand.

19. (**Regular**) QUICKSORT runs in time $O(n^2)$ on the average. Explain how it can be easily modified into an algorithm with a worst-case running time of $O(n \log n)$ by using the IMPROVEDSELECT algorithm we discussed in class.

20. (**Regular**) The binary sysem has base 2, while the decimal system has base 10. If the base of my system is n, how many digits do I need to express a number that is less than n^k? Now use this information to solve Exercise 8.3-4, p173.

21. (**Extra Credit**) Solve Exercise 8-5, p180

22. (**Exercise**) Run all the animation demos recommended in class.