Note:
1. Submit your assignments in the box outside the CS Dept. Office. The box is labeled with the course number and the name.
2. Do NOT try to find the solution by google. This is forbidden. I want the solution is got by yourself.
3. In your submission, please indicate you are in CS463 or CS363.

7.3-2
During the running of the procedure RANDOMIZED-QUICKSORT, how many calls are made to the random-number generator RANDOM in the worst case? How about in the best case? Give your answer in terms of \( \Theta \)-notation.

9.3-1
In the algorithm SELECT, the input elements are divided into groups of 5. Will the algorithm work in linear time if they are divided into groups of 7? Argue that SELECT does not run in linear time if groups of 3 are used.

9-1 Largest \( i \) numbers in sorted order
Given a set of \( n \) numbers, we wish to find the \( i \) largest in the sorted order using a comparison-based algorithm. Find the algorithm that implements each of the following methods with the best asymptotic worst-case running time, and analyze the running times of the algorithms in terms of \( n \) and \( i \).

a. Sort the numbers, and list the \( i \) largest.

b. Build a max-priority queue from the numbers, and call EXTRACT-MAX \( i \) times.

c. Use an order-statistic algorithm to find the \( i \)th largest number, partition around that number, and sort the \( i \) largest numbers.

17.1-3
A sequence of \( n \) operations is performed on a data structure. The \( i \)th operation costs \( i \) if \( i \) is an exact power of 2, and 1 otherwise. Use aggregate analysis to determine the amortized cost per operation.

17.2-2
Redo the above problem using an accounting method of analysis.