Assignment 2 (Programming)

Due at the end of the class meeting on Wednesday, Sep. 11th

Consider sorting n numbers stored in array A by first finding the smallest element of A and exchanging it with the element in $A[1]$. Then find the second smallest element of A, and exchange it with $A[2]$. Continue in this manner for the first $n-1$ elements of A, this algorithm is known as ***selection sort***.

1. Implement the selection sort.

2. Implement the insertion sort.

(For problem 1 and 2, please:

a. let your program generate a random array.
b. Output both your original random array and the sorted version of it)

Optional Problem: (Extra Credit: 100, due at the end of this semester)

3. Write a program to transform a free tree to a rooted tree. The free tree and the root are input by the user, and for the rooted tree, you output it level by level.

(Hint: Use Adjacency Matrix or Adjacency Lists to store the tree, and use queue to implement the transformation.)