**CSCI 520.001**

**Programming Assignment #10**

Turn in your work in the drop box for Assignment 10 (in Week 10) in eCollege 520.001 course by 11:59pm on Thursday, Nov. 20

In this assignment, you are given two functions **quicksort** and **partition**. You are required to do the following:

1. Modify as necessary all functions (partition and quicksort) such that quicksort returns the number of comparisons that it, and partition function together (in total) have performed in sorting the given array **a**. In these comparisons, only the comparisons that involve array elements are counted. **You are not allowed to use any global variable in counting these comparisons. You may want to add new parameters to functions and/or make them return integer values.**
2. Write a C++ program that receives as input an array of integers and calls quicksort to sort this array. Output must include the final sorted array and number of comparisons performed as described in Item 1 above.

One input to your program is the following:

28 14 5 19 23 6 29 4 13 18 22 10 16 21 3 5 7 26 18 20 11 25 17 27 9 30 24 8

Quicksort:

void quicksort(int a[], int l, int r)

{

if (r <= l) return;

/\* call for partition function that you modify \*/

quicksort(a, l, i-1);

quicksort(a, i+1, r);

}

Partition:

int partition(int a[], int l, int r)

{ int i = l-1, j = r; int v = a[r];

for (;;)

{

while (a[++i] < v) ;

while (v < a[--j]) if (j == l) break;

if (i >= j) break;

exch(a[i], a[j]);

}

exch(a[i], a[r]);

return i;

}