**CSCI 520L.01L**

**Programming Assignment #10**

To be done in the lab

(Friday, Nov. 7, JOUR 102)

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

1. Modify as necessary both functions (merge and mergesort) such that mergesort returns the total number of comparisons that have performed in sorting a 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 functions return integer values.**
2. Write a C++ program that receives as input an array of integers and calls mergesort 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

void merge(int a[], int l, int m, int r)

{ int i, j;

static int aux[maxN];

for (i = m+1; i > l; i--) aux[i-1] = a[i-1];

for (j = m; j < r; j++) aux[r+m-j] = a[j+1];

for (int k = l; k <= r; k++)

if (aux[j] < aux[i])

a[k] = aux[j--]; else a[k] = aux[i++];

}

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

{ if (r <= l) return;

int m = (r+l)/2;

mergesort(a, l, m);

mergesort(a, m+1, r);

merge(a, l, m, r);

}