# Department of Computing

**CS250: Data Structure and Algorithms**

**Class: BSCS 5AB**

# Lab 10: Bottom Up Merge Sort

**Date: 6th December, 2016**

**Time: 9am- 12pm / 2pm – 5pm**

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# Lab 10: Bottom up Merge Sort

**Introduction**

Proposed by Jon Von Neumann, Merge sort is one of the best algorithms out there for sorting purposes.

**Objectives**

To implement Bottom Up Merge sort

**Tools/Software Requirement**

Visual Studio c++ / Java / Python

**Lab Tasks**

You are required to upload the lab tasks on LMS and the name of that tasks must be in this format YourFullName\_reg#.cpp

Remember to comment your code properly.

**Task 1**

Implement Bottom Up Merge Sort with different N and with different values of H. Compare the performance of the algorithm with respect to number of iterations vs N and time taken vs N. Does it work with a very big value of N?

**Task 2**

* Calculate the total time for the computation of the Fibonacci series for n

Recursive Iterative

E.g. for N=10000 20ms 2ms

* Run some timing experiments with your program while trying different values of n. Be sure to time only the computation and not the user entering input, etc.
* Draw a graph in Excel showing two functions one for recursive function and other for iterative function.

**Task 3**

* Calculate the factorial of a number “n” given by user both recursively and iteratively. Figure out the difference in computational time by using both the approaches.
* Draw a graph in Excel showing two functions one for recursive function and other for iterative function.

(Hint: input at least 5 different values of “n” and make their entry in excel sheet. “n” can be of any data type. Try to use larger values of “n” for getting the useful data. )

**Deliverable**

Source code of Task 1,2,3 and excel graphs.