# Department of Computing

**CS250: Data Structure and Algorithms**

**Class: BSCS-4C**

**Lab 10: Sorting Algorithms**

**Date: 14 Dec, 2017**

**Time: 0900 to 1200**

# Instructor: Mr. Abid Rauf

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**Lab 10: Sorting Algorithms**

**Introduction**

In this lab, you will implement a sorting algorithms and compare it with different inputs.

**Objectives**

Objective of this lab is to implement insertion sort and compare the running times for different inputs.

**Tools/Software Requirement**

Visual Studio C++

**Description**

**Insertion Sort:**

Insertion sort is a popular sorting algorithm, which is quite simple to implement. The pseudo code is as follows:



**Lab Tasks**

**Task 1:**

Implement Insertion sort algorithms in C++.

**Task 2 Running Time Function:**

* Find O(n) for the average case
* Find O(n) for the worst case
* Find O(n) for the best case

**Task 3 Empirical Study:**

The next step is to compare the algorithm with two different inputs.

* 100,000 random numbers.
* 100,000 numbers sorted in ascending order.
* 100,000 numbers sorted in the descending order.

Run the algorithms on all three lists. Compare the running times for these inputs. How do they compare? Are the results what you expected, and why? Answer the questions in an end of word file.

**Deliverable**

Students are required to upload the lab task on LMS before the deadline. Compile a single Word document by filling in the solution/answer part and submit this Word file on LMS.

This lab is graded. Min marks: 0. Max marks: 10.