National University of Sciences and Technology (NUST)
School of Electrical Engineering and Computer Science

Department of Computing

CS250: Data Structure and Algorithms

Class: BSCS 5AB

Lab 7: Algorithms and Complexity

Date: 22nd November, 2016

Time: 9am- 12pm / 2pm – 5pm

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Lab 7: Sorting Algorithms and their Complexity comparison

Introduction

We have been discussing sorting algorithms and their complexities using asymptotic analysis. We would like to now verify our theoretical analysis by conducting experiments with code to see if our analysis is correct.

Objectives

To do a complexity comparative analysis of sorting algorithms

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.

Description:

- For each algorithm conduct at least 10 experiments for each case of complexity (best, worst, average) with different values of N.
- If 10 experiments are not enough for your analysis then you may increase the number for more values of N
- In your analysis try to find the relationship between N vs time taken and iterations by each algorithm
- To measure time for each algorithm use a function that can help you measure time of each algo (e,g, in Java stopwatch can be used)
- You may generate data randomly or manually, data can be simple integers or characters.
- You can read data from a file

Task 1
Bubble Sort N vs time and iterations

Task 2
Insertion Sort N vs time and iterations

Task 3
Selection Sort N vs time and iterations

Task 4

According to your analysis which algorithm among the three for which kind of scenario or N?

Deliverable

Upload code and your word document that discusses your analysis of the three algorithms