**CPSC 1160: Week 7 Lab**

**Due: As indicated by submission link**

**Total Marks: 10**

**Instructions – PLEASE READ**

1. This work is to be done individually.
2. You should submit only one version via D2L. Check instructions from TA regarding what to submit (zip/just code). Code files must always be included.
3. Keep a copy of everything you submit in some online storage that is accessible by you only.

# EXERCISES

You will find various sorting algorithms inside the zip file for this lab.

* 1. The code for the following algorithms are not recursive, transform them into recursive algorithms
     1. Selection sort
     2. Bubble sort
     3. Insertion sort
  2. Measure (and output to a file named “SortingAlgorithms.txt”) the physical running times of each of the sorting algorithms (recursive versions) by applying them to arrays of random integers of lengths:
     1. 100
     2. 1000
     3. 10000
     4. 100000
     5. 1000000

For each length output time taken by each sorting algorithm (along with its name) in ascending order.

Time taken by a sorting algorithm should only include the sorting time (and not include time taken to generate the array, write results to file, free array etc).

Here’s a way to measure the physical running time of some code in c++.

// must include <ctime>

clock\_t start = clock();

// call the function that you want to time

clock\_t end = clock();

long long int timeTaken = (long long int)((end - begin) / CLOCKS\_PER\_SEC);