ECE 697CE: Foundations of Computer Engineering

Project 2: C++ Programming

The goal of this project is to practice elementary concepts in C++ programming.

[1] Write a C++ program that generates an array of 50 random integers no greater than 100.

[2] Figure out a way to measure the execution time of a particular section of a program in C++ and use this approach to time the portion of the program written in question [1] that generates the array.

[3] Repeat [1] and [2] for array sizes of 500, 5000, and 50000.

[4] Write a C++ function that sorts an array of integers in descending order given as input the size and the starting address of the array using the following sorting algorithms:

    a. Bubble sort

    b. Selection sort

    c. Insertion sort

[5] Combine the codes you developed in steps [1] through [4] to compare the speed of the three above mentioned sorting algorithm (in your report provide a Table that lists the time required to sort arrays of four different lengths (50, 500, 5000, and 50000) using the three sorting algorithms for comparison and use this Table to draw conclusions of your study).

[6] What is the complexity of the program in [1]? Explain your answer.

Your formal report for this project should have detailed description of your approach for steps [2] and [6] and the code for step [5] along with the collected data and any screenshots or any other output(s) that you find necessary for backing up your project and its results.