



Columbia College  
Vancouver, Canada

**Introduction to Computer Science and Programming 1**  
**CSCI120**

**Chapter14: Data Structures and Algorithms**

Lab 14

**Note:** This document has been designed and developed as part of an initiative for creating an OER (Open Education Resource) package for the course CSCI 120 at Columbia College.

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## Problem1

- The following list is given, visually show how the insertion sort is used to sort the list.
  - o [10, 2, 3, 7, 1, 7, 9, 2]

## Problem2

- The following list is given, visually show how the merge sort is used to sort the list.
  - o [10, 2, 3, 7, 1, 7, 9, 2]

## Problem3

- Explain when you would use Merge sort and when you would use another algorithm for sorting even though the time complexity order of Merge sort is  $O(N\log N)$

## Problem4

- Suppose a dictionary given where the keys are student's IDs and the values of the list of grades each student has receives. Write a Python program which calculates the GPA for each student. What is the time complexity of your algorithm.

**Good Luck ☺**