**CS 250 - Fall 2021 - Homework 05**

# Objectives

The objectives of this assignment are:

* Testing your understanding of sorting algorithms
* To give additional practice with array and looping constructs.
* To give additional practice with String methods.
* To give additional practice with parsing inputs and exception handling.

# Part 1. Non-programming Questions ( 50 points)

## Q1. (30 points) Given the following array of integers: {45, 11, 50, 59, 60, 2, 4,

**7, 10}.**

Draw the figures to demonstrate how to apply selection sort, bubble sort, insertion sort, and merge sort to sort the above list. Use the example figure in the slides of lecture 10.

**Selection Sort Bubble Sort**

|  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- |
| 45 | 11 | 50 | 59 | 60 | 2 | 4 | 7 | 10 |
| 2 | 11 | 50 | 59 | 60 | 45 | 4 | 7 | 10 |
| 2 | 4 | 50 | 59 | 60 | 45 | 11 | 7 | 10 |
| 2 | 4 | 7 | 59 | 60 | 45 | 11 | 50 | 10 |
| 2 | 4 | 7 | 10 | 60 | 45 | 11 | 50 | 59 |
| 2 | 4 | 7 | 10 | 11 | 45 | 60 | 50 | 59 |
| 2 | 4 | 7 | 10 | 11 | 45 | 60 | 50 | 59 |
| 2 | 4 | 7 | 10 | 11 | 45 | 50 | 60 | 59 |
| 2 | 4 | 7 | 10 | 11 | 45 | 50 | 59 | 60 |
| 2 | 4 | 7 | 10 | 11 | 45 | 50 | 59 | 60 |

**Scatter chart

Description automatically generatedInsertion Sort Merge Sort**



## Q2. (20 pts) Insertion sort in descending order

Use the code of insertion sort in Lab 10 to modify and create a new version of insertion sort that sorts the array in descending order. Fill your code below:

private static void insertionSortDesc(int[] arrInt) {

for(int i = 1; i < arrInt.length; i++) {

int tmp = arrInt[i];

int j = i-1;

while ( j >= 0) {

if(arrInt[j] < tmp) {

arrInt[j+1] = arrInt[j];

j--;

} else {

break;

}

}

arrInt[j+1] = tmp;

}

}