

# CS380 Algorithm Design & Analysis

## Assignment 1: Insertion and Merge Sort

---

**Date Assigned:** Thursday, February 5, 2009

**Date Due:** Thursday, February 12, 2009

**Total Points:** 25pts

For this assignment you are to implement both insertion sort and merge sort in C++ using the Visual Studio project (SortProject) that I have placed in the CS380 public folder on Turing.

The SortProject contains four files:

- **main.cpp:** uses the BubbleSortArray to create an array, insert elements in the array, and sort the elements in the array.
- **BubbleSortArray.h:** Defines the header file for the class BubbleSortArray, which inherits from the class IArray.
- **BubbleSortArray.cpp:** Contains the implementation of the constructor and sort function in the BubbleSortArray class.
- **IArray.h:** Defines an abstract class for a dynamically sized array. I have hidden the implementation and just provided you with the interface containing the function headers.

You are to add two classes to this project:

- InsertionSortArray: implements the insertion sort algorithm
- MergeSortArray: implements the merge sort algorithm

You can add as many functions as you like to the classes, in fact the more functions the better. Also remember to follow the coding standards that are linked from the website.

Your program should output the following:

- 30 random numbers before insertion sort, then again after insertion sort.
- 30 random numbers before merge sort, then again after merge sort.

### What to Submit

- Submit an electronic copy of your project by 9:40am on the day that it is due. Name your project "01PUNETSortProjec", replacing PUNET with your PU Net ID (i.e. khoj0332).
- Submit a stapled hard copy of the files in this order: main.cpp, InsertionSortArray.h, InsertionSortArray.cpp, MergeSortArray.h, MergeSortArray.h