**COMP 482 Project 3**

**OBJECTIVE:** Implement the O(n log n) algorithm that solves the Counting Inversions problem from Chapter 5.

**Input Format:** The input file will be called input3.txt and be in the same directory as the java and class files. The format of input3.txt will be a standard text file containing whitespace (spaces/tabs/newlines) separated integers. Please note to put a single space between numbers to act as a delimiter (see examples below)!

**Output:** A single number which is the inversions in the data set from the file input3.txt.

**What you need to do:** You must use the algorithm based upon merge sort. A submission which does the calculation in time $O(n^2)$ will lose credit. The test cases your program will be run against will be much larger than the ones below.

**EXAMPLE #1:** Given an input3.txt file of:
1 12 13 24 35 46 57 58 69

**Then the output would be:**
0

**EXAMPLE #2:** Given an input3.txt file of:
92 47 21 18 3

**Then the output would be:**
10

**EXAMPLE#3:** Given an input3.txt file of:
21 59 98 23 1 5 97

**Then the output would be:**
11

**Project information and Project Submissions:**
- Projects will be done **ONLY** in **Java** (No other languages will be accepted)
- Students should begin to work on projects when the project specifications are released.
- Projects will be released as early as possible to students, and you are encouraged to complete the projects as early as possible. Even if a topic has yet to be covered, if students have taken the time to learn the material beforehand, feel free to attempt projects early and submit them early.
- You will be able to submit your project as many times as you wish until the deadline given. (**For a regrade you must submit the project at least 7 days prior to the deadline otherwise there will be no regrade**)
**- Late projects will not be accepted.**

**Projects must be submitted as follows:**
- You must submit your project to Canvas **ONLY.** Email submissions will not be accepted.
- The file must be submitted in a ".zip" format
- The ".zip" file should be named with your First and Last name with the project number at the end (Example: DinoBiel1.zip)
- If working in visual studio please do not zip the entire project. Only zip the ".java" file (doing this will cost you points!)
- you must use the DEFAULT package, if not sure how to do this, ask the professor.
- Failure to comply with the rules above will result in a major loss of points on the project!

**Grading Rubric:** When grading your projects I will assign grades based on the following criteria:
- Does the project work according to the specification including reasonable time complexity? – **50%**
- Does the project utilize the concepts requested in the specification? – **30%**
- Is the code provided in the project well formatted? – **10%**
- Does the code contain sufficient and useful comments to explain sections of the code? – **10%**