**COSC 320 – 001**

***Analysis of Algorithms***

2022/2023 Winter Term 2

**Project Topic Number: #**

**Title of project**

**Group Lead:**

**Group Members:**

**Abstract.** One paragraph of your achievements in this milestone. This should be included for all milestones.

**For Project Proposal use the following headers. (Maximum 2 pages excluding the cover page)**

**Problem Description**. Explain the problem in your own words (formal description not required) and include an example.

**Edge Cases.**

**Expected complexities.**

**Dataset Collection.** Include plans for dataset collection or generation. If you already have searched for it, include links to the dataset. Also, mention the details of the dataset: how many records, what columns (fields), format of the data, etc.

**Programming Language.** Which programming language are you going to use for implementation of your ideas? Choose between Java and Python.

**Task Separation and Responsibilities.** How are you going to divide the work between group members? Explicitly mention the name of the group member and the responsibilities throughout the project.

**Unexpected Cases/Difficulties.** If you encountered any issues for design and implementation of your work, include it here. Also, mention the solutions you have considered to alleviate the issue.

**For First Milestone use the following headers. (Maximum 4 pages excluding the cover page)**

**Problem Formulation**. Formulate the problem as an algorithmic problem, include the mathematical notations. For example, given an input array A of length n, the algorithm should output A in sorted order.

**Pseudo-code.**

**Algorithm Analysis.** Include the analysis of the algorithm and proof of correctness and running time of your algorithm.

**Unexpected Cases/Difficulties.** If you encountered any issues for design and implementation of your work, include it here. Also, mention the solutions you have considered to alleviate the issue.

**Task Separation and Responsibilities.** Who did what for this milestone? Explicitly mention the name of group members and their responsibilities.

**For Second Milestone use the following headers. (Maximum 4 pages excluding the cover page)**

**Algorithm Analysis.** Include the analysis of the algorithm and proof of correctness and running time of your algorithm.

**Data Structure.** Choice of your data structure and the rationale behind it.

**Unexpected Cases/Difficulties.** If you encountered any issues for design and implementation of your work, include it here. Also, mention the solutions you have considered to alleviate the issue.

**Task Separation and Responsibilities.** Who did what for this milestone? Explicitly mention the name of group members and their responsibilities.

**For Third Milestone use the following headers. (Maximum 4 pages excluding the cover page)**

**Dataset.** Include the details of the dataset.

**Implementation.** Explain how you implemented the algorithm and tested it. All the subtle details should be included. This is just an explanation and you do not need to copy paste your implementation here. It can be as short as one paragraph. Include links if required.

**Results.** Include the plots and the interpretation of the plots as input grows. Compare it to the big O function of the running time. For example, if your algorithm runs in , show the graph for the function in same plot as well. Explain if this is what you expected, and how the implementation of your algorithm might have affected the constant values. How the choice of data structure might have affected this result?

**Unexpected Cases/Difficulties.** If you encountered any issues for design and implementation of your work, include it here. Also, mention the solutions you have considered to alleviate the issue.

**Task Separation and Responsibilities.** Who did what for this milestone? Explicitly mention the name of group members and their responsibilities.

**For Fourth Milestone use the following headers. (Maximum 4 pages excluding the cover page)**

**Implementation.** Explain how you implemented the algorithm and tested it. All the subtle details should be included. This is just an explanation and you do not need to copy paste your implementation here. It can be as short as one paragraph. Include links if necessary.

**Results.** Include the plots and the interpretation of the plots as input grows. Compare it to the big O function of the running time. For example, if your algorithm runs in , show the graph for the function in same plot as well. Explain if this is what you expected, and how the implementation of your algorithm might have affected the constant values. Compare it to your first algorithm and explain how it differs.

**Unexpected Cases/Difficulties.** If you encountered any issues for design and implementation of your work, include it here. Also, mention the solutions you have considered to alleviate the issue.

**Task Separation and Responsibilities.** Who did what for this milestone? Explicitly mention the name of group members and their responsibilities.