



NORTHEASTERN UNIVERSITY, KHOURY COLLEGE OF COMPUTER SCIENCE

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# CS 6220 Data Mining - Final Project

## Due: December 12, 2023(100 points)

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NAME(S)  
PROJECT GIT REPOSITORY

The project is 10% of your grade, and is broken down as follows. The report comprises 75% of your grade, and the class presentation comprises 25%. More details about the presentation breakdown can be found on the [website](#). (Presentation - 25pts)

### 1 Introduction

Introduce us to your problem, why it's important and interesting, and why it's worth solving. Incorporate elements of your proposal, adding both your objective and motivation. Make sure you mention what impact your work will have and what your solution enables others to do. Describe some of the challenges. Finally, outline the remainder of your document. (5pts)

### 2 Background

This section should describe how this problem arises, who is affected, and any literature that you plan on reviewing or survey. These references should relate to both the applications of the work as well the technical approaches to be taken. Emphasize why they are appropriate and relevant. (5pts)

### 3 Approach

This section should provide the meat of your work. I expect all teammates on the project to contribute to this section. If there are several different approaches, please aggregate the information across the approaches rather than individually presenting them. For example, if person *A* tries random forests, person *B* tries deep neural networks, and person *C* tries naïve Bayes, present these on the same graph, and talk about them in aggregate. (Do *not* have three subsections devoted to each approach.) The project should be a cohesive description of the

approaches and algorithms and how they relate to each other.

Your work is evaluated on criteria relating to the documentation and presentation of the material as much as the technical approach. Please review the subsections that will serve as a grading rubric.

### 3.1 Data and Data Analysis

*Amount of Data* - In this course, we are mining data, which means that there should be enough rows / samples for the mining to be interesting and the conclusions to be statistically significant. This number varies with number of features and labels, but more than 100,000 rows is generally sufficient in most cases (more is better). It must not be able to be intuited by hand, at least easily. (10pts)

*Data Analysis and Exploration* - Please analyze your data before doing any modeling. Understand the distributions of your data. Determine feature correlation with the label (if you have labels) and each other.

If you're choosing a project besides Greenstand, make sure you describe the specifics of your data and what information that you believe would be most useful from it. This includes how you will do feature selection or dimensionality reduction. If you're using the Greenstand data, articulate what features and data you plan on leveraging. (20pts)

### 3.2 Implementation

*Correctness* Clearly state your objective functions and what you are optimizing for. Discuss any regularization that you've applied. Ensure that your algorithm works and appropriately models the phenomenon without overfitting (or underfitting). For example, if you have class imbalance of  $P(A) = 0.9$  and  $P(B) = 0.1$ , and your implementation should not claim 90% accuracy by simply always prediction  $A$ . (20pts)

## 4 Results and Evaluation

*Well-Reasoned Evaluation* Clearly define the evaluation metrics you're using and why. Properly evaluate and draw conclusions. Determine the confidence you have in the outcomes of your processing and modeling. (10pts)

## 5 Conclusions

Discuss what you've learned. How do you think it can be applied? If you had more time, what are the future directions? If there's literature on future directions, include them. (5pts)

## 6 Submission Guidelines

Upload your PDF file and Github URL to [Gradescope](#) as a *single* submission with all members of the team. On the top of the document, include the teammates and project repository. *Try to keep your proposal below three pages.*