PROJECT OVERVIEW STATEMENT	**Project Name:** "Analyzing NYC 311 Service Requests: Identifying Patterns, Prioritizing Issues, and Improving Public Services"	**Student Name:** Pritam Madhusudan Channawar

Problem/Opportunity:

New York City has a website called NYC311 where people can tell the city about problems that aren't emergencies, like a broken streetlight. Different parts of the city government handle these requests depending on what the problem is. But there's a big challenge because there are so many requests coming in from people all over the city. They get more than 24 million requests since 2010. This huge number of requests makes it hard for the city to respond quickly and can affect how good their services are and how happy people are with them.

The NYC311 system keeps a lot of information about these requests, like what the problems are, where they happen, and how long it takes to fix them. This wealth of data presents a valuable opportunity to gain insights into the city's service delivery, identify patterns, and prioritize issues based on their impact and urgency.

Goal:

The goal of this NYC 311 service request research project is to develop an advanced analytical framework and optimal Machine learning predictive model that leverages the extensive dataset of service requests to enhance the efficiency and effectiveness of public service delivery in New York City. Specially, this framework aims to provide a streamlined process for identifying patterns, prioritizing service issues, and recommending targeted interventions. By employing data-driven insights, I seek to measurably reduce response times and resource allocation inefficiencies, ultimately leading to an improved quality of life for residents.

The goal is specific in its focus on optimizing service delivery and progress can be measured through quantifiable improvements in response times and resource allocation. This research project can be completed by one person given the time duration of at least 2 to 3 months based on availability of existing data and analytical tools.

Objectives:

Objective 1:
Outcome: Build a linear model that can accurately predict total time taken to resolve a call based on Hour at which call is received at the Agency, given a set of observations of an independent variable Hour at which call is received and a dependent variable total time.
Time Frame: Within 2 months of project initiation.
Measure: when given new values of Hour at which call is received, it can give a good estimate of the new values of total time.
Action: Develop a linear model that can predict the time it can take to solve the issue, based on the available data.

Objective 2:
Outcome: build a logistic regression model that can accurately predict the type of complaint based on the time of day and the city where the complaint was filed.
Time Frame: Within 1 months of project initiation.
Measure: Metrics like accuracy, precision, recall, F1 score, and area under the receiver operating characteristic curve can be used to measure how well the model works (ROC-AUC).
Action: find a model that can accurately predict the type of complaint based on the time of day and the city, so that resources can be better used, and customer satisfaction can be improved.

Objective 3:
Outcome: Develop a predictive model to identify patterns and trends in NYC 311 service requests.
Time Frame: Within 2 months of project initiation.
Measure: Achieve a predictive accuracy of at least 85% on a validation dataset.
Action: Collect and preprocess historical NYC 311 data, build and train machine learning models, and evaluate their performance.

Objective 4:
Outcome: Create a geographic analysis of service requests to identify high-impact areas.
Time Frame: Within 1 month of project initiation.
Measure: Visualize a large amount of location data in your browser. Playback geo-temporal trends over time. Explore, filter, and deeply engage with location data to gain insight.
Action: Kepler.gl is designed for geospatial data analysis. It allows technical and non-technical audiences to visualize trends in a city or region.

Objective 5:
Outcome: Implement a prioritization system for service requests based on their impact & urgency.
Time Frame: Within 2 months of project initiation.
Measure: Reduce response times for high-impact service requests by 20%.
Action: Develop an algorithm that assigns priority scores to service requests and integrate it into the NYC 311 system.

Success Criteria:

The project will be considered a success if the following criteria are met:

- The predictive model developed for identifying patterns and trends in NYC 311 service requests achieves an accuracy of at least 80% on the validation dataset.
- The geographic analysis successfully identifies high-impact areas, as demonstrated by heatmaps and visualizations that clearly pinpoint regions with the highest service request density.
- The prioritization system for service requests based on impact and urgency is effectively integrated into the NYC 311 system and leads to a measurable reduction in response times for high-impact requests.
- The project provides a comprehensive report with actionable insights and recommendations for improving public service delivery, addressing identified service delivery issues effectively.
- The project is completed within the specified time frame, with all objectives achieved within their designated deadlines.
- Effectively demonstrates the technical skills and expertise required to collect, preprocess, analyze, and visualize and model NYC 311 service request data.

Assumptions, Risks, Obstacles:

Several critical factors may influence the outcome of this NYC 311service request analysis. One assumption is that the dataset provided by the NYC 311 system is complete and accurately reflects the range of service requests across the city. However, potential data inconsistencies, missing information, or inaccuracies could impede the accuracy of our analysis. Also, there is a risk of encountering unforeseen technical challenges in handling and processing the extensive dataset, potentially leading to delays in project timelines. External factors, such as changes in city policies or procedures related to service request handling, could also impact the project's progress. It's crucial to consider the potential limitations of the analysis, including the need for careful interpretation of findings and recognition of any biases inherent in the data. Vigilant risk management and contingency planning will be essential to mitigate these potential obstacles and ensure the successful completion of the project.

Prepared By	**Date**	**Approved By**	**Date**
Pritam Madhusudan Channawar	25 September 2023		