**PROJECT PROPOSAL**

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**Problem Statement:** Bike sharing systems are a means of renting bicycles where the process of obtaining membership, rental, and bike return is automated via a network of kiosk locations throughout a city. Using these systems, people are able rent a bike from a one location and return it to a different place on an as-needed basis.

**Objective:** To develop a machine learning model(s) that will predict bike demand based on various factors such as weather, day, season enabling bike rental companies to optimize their operations and resources.

**Data:** The dataset includes hourly bike rental data from a bike rental company along with features such as season, weather, temperature, humidity, wind speed, and the number of registered and non-registered user rentals. The dataset also includes information on the date and time of each rental. These features will help us explore the various impact of bike demand through exploratory data analysis.

**Methodology:**

1. Preprocessing and cleaning: We will preprocess the data by identifying and handling missing values and outliers and removing duplicates. We will also explore normalization features to improve model performance.
2. Feature selection: We will use correlation analysis or recursive feature elimination techniques to identify the most important features of the model.
3. Model selection: We will test various machine learning algorithms such as linear regression and decision trees to identify the best-performing model. Although the target feature is continuous, we will create a group metric and explore the strengths and weaknesses of classification algorithms like KNN and Ensemble methods.
4. Model evaluation: RMSLE will be implemented to evaluate our model performance. We will also use metrics such as accuracy and F1 score to evaluate the performance of classification model.

**Potential Impact and Benefits:** The machine learning model can help bike rental companies optimize their operations and resources, reducing costs and increasing revenue. The model can also improve the user experience for customers by ensuring that bikes are available when they need them.