Regressing Bike Demand in the American Market

Introduction:

Bike-sharing systems have gained immense popularity and importance in recent years, providing an eco-friendly and efficient mode of transportation. With the ongoing pandemic affecting businesses, companies like BoomBikes must adapt and plan for the future. Our project aims to help BoomBikes understand the demand for shared bikes in the London market's recovering economy. By identifying significant variables influencing bike demand, BoomBikes can effectively prepare to meet customers' needs.
The primary objectives of this project are as follows:

- Develop a regression models to identify the key variables that significantly impact the demand for shared bikes.
- Quantify the relationship between these variables and the bike demand

Data Description:

We will analyze a dataset provided by BoomBikes, which includes the following variables:

- **Dependent variable:**

    - **"cnt"** - Count of new bike shares.

- **Independent variables:**

  - "timestamp" - Timestamp for data grouping. **(Variable of Interest)** - **"t1"** - Real temperature in Celsius.

  - **"t2"** - "Feels like" temperature in Celsius.
  - **"hum"** - Humidity percentage.
  - **"wind_speed"** - Wind speed in km/h.
  - **"weather_code"** - Category of weather.
  - **"is_holiday"** - Boolean field (1 for holiday, 0 for non-holiday).
  - **"is_weekend"** - Boolean field (1 if the day is a weekend, 0 otherwise).
  - **"season"** - Category field representing meteorological seasons: 0-spring, 1-summer, 2-fall, 3- winter.

Methodology:

We will employ multiple regression analysis to understand the relationships between these variables and the demand for shared bikes. Our methodology includes:

- Data Preprocessing: Cleaning, handling missing data, and encoding categorical variables.
- Exploratory Data Analysis (EDA): Understanding the dataset's characteristics and relationships between variables.
- Interpretation: Analyzing the significance of each variable's impact on bike demand.

Expected Outcomes:

At the end of this project, we anticipate:

- A comprehensive analysis of the factors influencing bike demand in the London market.
- A multiple regression model capable of estimating bike demand based on relevant variables.
- Valuable insights for BoomBikes to enhance their business strategies and optimize resource allocation.