**Bike sharing demand prediction**

**Business Objective**

Bike-sharing demand analysis refers to the study of factors that impact the usage of bike-sharing services and the demand for bikes at different times and locations. The purpose of this analysis is to understand the patterns and trends in bike usage and make predictions about future demand.

**Data Description**

The dataset has 1 csv file,

Data has 17 columns and 17379 rows

The data consists of the following attributes:

* date: date
* season: season (1:winter, 2:spring, 3:summer, 4:fall)
* year: (0: 2011, 1:2012)
* month: month ( 1 to 12)
* hour: hour (0 to 23)
* holiday: weather day is holiday or not
* weekday: day of the week
* workingday: if day is neither weekend nor holiday is 1, otherwise is 0.
* weather:

1: Clear, Few clouds, Partly cloudy, Partly cloudy

2: Mist + Cloudy, Mist + Broken clouds, Mist + Few clouds, Mist

3: Light Snow, Light Rain + Thunderstorm + Scattered clouds, Light Rain + Scattered clouds

4: Heavy Rain + Ice Pallets + Thunderstorm + Mist, Snow + Fog

* temp: Normalized temperature in Celsius. The values are derived via (t-t\_min)/(t\_max-t\_min), t\_min=-8, t\_max=+39 (only in hourly scale)
* atemp: Normalized feeling temperature in Celsius. The values are derived via (t-t\_min)/(t\_max-t\_min), t\_min=-16, t\_max=+50 (only in hourly scale)
* humidity: Normalized humidity. The values are divided to 100 (max)
* windspeed: Normalized wind speed. The values are divided to 67 (max)
* casual: count of casual users
* registered: count of registered users
* demand: demand of the bikes

**Aim**

Develop and evaluate predictive models that can effectively forecast bike rental demand using techniques like regression analysis, time series analysis, machine learning algorithm.

**Tech stack**

* Language - Python
* Libraries – numpy, pandas, matplotlib, sklearn, math

**Approach**

1. Importing the required libraries and reading the dataset.

* Understanding the dataset

2. Exploratory Data Analysis (EDA) –

* Data Visualization

3. Feature Engineering

* Dropping of unwanted columns
* Removal of null values
* Checking for multi-collinearity and removal of highly correlated features

4. Model Building

* Performing train test split
* Linear Regression

5. Model Validation

* Accuracy score
* MSE
* RMSE
* RMSLE

7. Creating the final model and making predictions

8. Print the RMSLE.