**Capstone Project Submission**

**Instructions:**

i) Please fill in all the required information.

ii) Avoid grammatical errors

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| **Please write a short summary of your Capstone project and its components. Describe the problem statement, your approaches and your conclusions. (200-400 words)** |
| **A bike rental or bike hire business rents out motorcycles  for short periods of time, Usually for a few hours. Most rentals are provided by bike shops as a sideline to their main businesses of sales and service, but some shops specialize in rentals.**  **As with car rental, bicycle rental shops primarily serve people who do not have access to vehicle, typically travellers and particularly tourists.**  **Bike rental shops rent by the day or week as well as by the hour, and these provide an excellent opportunity for those who would like to avoid shipping their own bikes, but would like to do a multi-day bike tour of a particular area.** **.****Eventually, providing the city with a stable supply of rental bikes becomes a major concern. The crucial part is the prediction of bike count required at each hour for the stable supply of rental bikes** **This project main objective is Perform ‘Exploratory Data Analysis’ AND applying Machine learning algorithms aimed at predicting the bike sharing demand prediction i.e renting bikes counting for each our on dataset**  **Our Project is to Investigate patterns and explanations in the context and convey the results in a dynamic and visual manner.** **Problem Statement:**  **Currently Rental bikes are introduced in many urban cities for the enhancement of mobility comfort. It is important to make the rental bike available and accessible to the public at the right time as it lessens the waiting time. Eventually, providing the city with a stable supply of rental bikes becomes a major concern. The crucial part is the prediction of bike count required at each hour for the stable supply of rental bikes.**  **Our experiment can help understand what could be the reason for the prediction of such labels by feature selection, data analysis and prediction with machine learning algorithms taking into account previous trends to determine the correct prediction**  **Approach:**  **To perform Exploratory Data Analysis on BIKE SHARING DEMAND PREDICTION, we imported Python libraries like Numpy, Pandas, Matplotlib, Seaborn and Plot to display the analysis dataset and also imported from Sk learn preprocessing data using standard scaler, and importing Linear regression, LASSO , RIDGE REGRESSION, Random Forest Regressor, Gradient boost regressor, Default XG booster, XG boost With Grid search CV, CAT boost Regressor for predicting Rental bikes per hour getting accuracy for finding BIKE SHARING DEMAND PREDICTION and in Graphical form through Bar Plot, count plot, Histogram and Heatmap etc. Statistical graphics and other Data visualization methods are used to summarize their main characteristics of “BIKE SHARING PREDICTION”.**  **Conclusion**: We conclude that   * **maximum rented bikes are 3556,minimum rented bikes are zero also existed** * **Rented\_bikes are took in Non-Holidays maximum bikes taken is 3,556 in 1 hour and Bikes not took by any one in 295 hours  and the rented bikes worked when temperature above 20 centigrades in Non-Holiday days** * **most of the rented bikes are taken when the Humidity is higher 20% ,all seasons have equal demand for Rental\_bikes** * **In functional working day when ever Rainfall reaches 10mm then rented\_bikes reducing and when Rainfall is high i.e more than 20mm renting bikes done rarely.** * **we ever snow\_fall is zero the Rental\_bikes high peack and when  ever snow\_fall is four or more  then taking rental bikes less and sometimes No one taking rental\_bikes.** * **We used different type of regression algorithms to train our model like, Linear Regression, Regularized linear regression (Ridge and Lasso),Random Forest Regressor, Gradient boosting Regressor, default XGboost regressor. and Also we tuned the parameters of Random forest regressor and XGboost regressor Out of them XGboost with Grid search CV (tuned hyperparameters gave) the best result.** * **MSE is approx 59734,** * **RMSE IS approx 245,** * **MAE is approx 159,** * **R2 is approx 86%,** * **Adj R2 approx 86%** |
| **Individual Member Name, Email and Contribution:** |
| **Team Members**  **1. Kota Lakshmana Rao**  **EMAIL::** [**lakshmanteja9@gmail.com**](mailto:lakshmanteja9@gmail.com)    **Individual member contribution:**  **1.Kota Lakshmana Rao**    **(i). Importing data set**  **(ii). Processing of dataset**  **(iii). Cleaning of data set**  **(iv). Finding correlation**  **(v). Creating heatmap**  **(vi). Data visualization of Rented bikes**  **(vii). Exploring Numerical variables**  **(viii). Data visualization of Frequent Seasons**  **(ix) .Data visualization of Frequent Holiday count**  **(x). Data visualization of Frequent functional day count**  **( xi). Data visualization of Rented bikes vs hour**  **(xii). Data visualization of Rented bikes vs Humidity**  **(xiii).Data visualization of Rented bikes vs wind speed**  **(xiv).Data visualization of Rented bikes vs Rainfall**  **(xv). Data visualization of Rented bikes vs Snow fall**  **(xvi) . Creating Heat Map after Multicollinear removing**    **(xvii). Applying Linear Regression and LASSO, RIDGE Regression, Random forest Regressor and Gradient Boost Regressor and Default XG Boost and XG boost with Grid search cv and CAT BOOST Regressor**  **(xviii).ppt slides related from (v) to (xvii)**  **(xix). Technical document related from (v) to (xvii)** |
| **Please paste the GitHub Repo link.**  Kota Lakshmana Rao’s Github Link:  <https://github.com/kota-Git/Bike-Sharing-Demand-Prediction_capstone_project-2>  **Please paste the Google drive link:-**  **kota Lakshmana Rao:-**  [**https://drive.google.com/drive/folders/1HWXu\_aaAe2j6ofPQW2gkpumhEwqSR4yD?usp=sharing**](https://drive.google.com/drive/folders/1HWXu_aaAe2j6ofPQW2gkpumhEwqSR4yD?usp=sharing) |
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