Rental bikes Demand Prediction

Prepared By:

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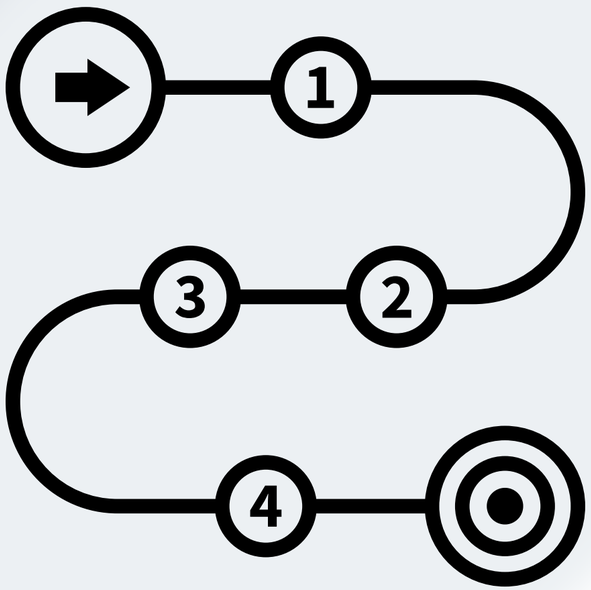

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AGENDA

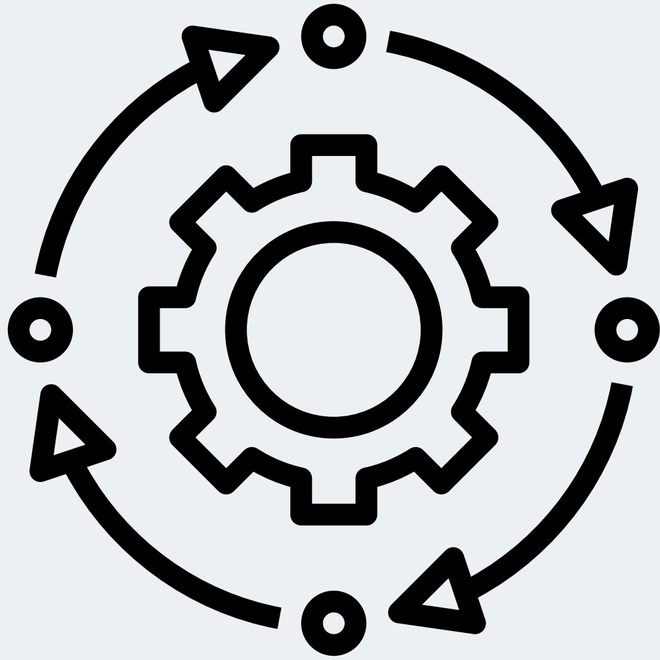
- Currently Rental bikes are introduced in many urban cities for the enhancement of mobility comfort.
- It is important to make the rental bike available and accessible to the public at the right time as it lessens the waiting time.
- Eventually, providing the city with a stable supply of rental bikes becomes a major concern.
- The crucial part is the prediction of bike count required at each hour for the stable supply of rental bikes.

Data - Description

- Date : year-month-day
- Rented Bike count - Count of bikes rented at each hour
- Hour - Hour of he day
- Temperature-Temperature in Celsius
- Humidity - %
- Windspeed - m/s
- Visibility - 10m
- Dew point temperature - Celsius
- Solar radiation - MJ/m2
- Rainfall - mm
- Snowfall - cm
- Seasons - Winter, Spring, Summer, Autumn
- Holiday - Holiday/No holiday
- Functional Day - No Fun (Non Functional Hours), Fun(Functional hours)

Process followed in Project

1. Data Collection
2. Data Cleaning
3. Building Model
4. Training Model
5. Testing Model
6. Make Prediction



Model 1

- Fitted linear regression model.
- Calculate the MSE (Mean squared error),RMSE(Root mean squared error),MAE(Mean absolute error),R2,Adjusted R2 values.
- Calculated for both the Train and Test dataset.
- Calculated values are stored in dictionary as training and testing.

Model 2

- Fitted Random forest Regressor.
- Calculate the MSE (Mean squared error), RMSE(Root mean squared error), MAE(Mean absolute error), R2, Adjusted R2 values.
- Calculated for both the Train and Test dataset.
- Calculated values are stored in dictionary as training and testing.
- Finds the feature importance and plots in the bar graph.

Model 3

- Fitted Gradient Boosting Regressor
- Calculate the MSE (Mean squared error), RMSE(Root mean squared error), MAE(Mean absolute error), R2, Adjusted R2 values.
- Calculated for both the Train and Test dataset.
- Calculated values are stored in dictionary as training and testing.
- Finds the feature importance and plots in the bar graph.

Model 4

- Fitted Gradient Boosting gridsearchcv
- Calculate the MSE (Mean squared error), RMSE(Root mean squared error), MAE(Mean absolute error), R2, Adjusted R2 values.
- Calculated for both the Train and Test dataset.
- Calculated values are stored in dictionary as training and testing.
- Train data R2 value = 0.95
- Test data R2 value = 0.92.
- Finds the feature importance and plots in the bar graph.

Model Comparison

		Model	MAE	MSE	RMSE	R2_score	Adjusted R2
Training set	**0**	Linear regression	4.474	35.078	5.923	0.772	0.77
	1	Random forest regression	0.802	1.581	1.257	0.990	0.99
	2	Gradient boosting regression	3.269	18.648	4.318	0.879	0.88
	3	Gradient Boosting gridsearchcv	1.849	7.455	2.730	0.952	0.95
Test set	**0**	Linear regression	4.410	33.275	5.768	0.789	0.78
	1	Random forest regression	2.214	12.670	3.560	0.920	0.92
	2	Gradient boosting regression	3.493	21.289	4.614	0.865	0.86
	3	Gradient Boosting gridsearchcv	2.401	12.393	3.520	0.922	0.92

Result

- Concatenate the stored training and testing data in a separate dictionaries for the comparison of algorithms .
- The concatenation is done by using the pandas library.
- Finally displays the Result of all the algorithms after concatenation.
- By observing all the result best model can be choosed.
- Random forest regressor is the best regressor model for the dataset uploaded.
- It has the highest R2 score of 0.98 for train set and 0.91 for the test set.

Thank You