



Analysis of Factors Influencing Bike Rentals in a Shared Bicycle System

INFO 6105

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Introduction to Bike-Sharing Systems

- Impact of weather on bike rentals.
- Differences in rentals between weekdays and weekends.
- Utilize day.csv dataset for comprehensive insights

Exploratory Data Analysis (EDA)



Histograms

Temperature, humidity, and rental distributions



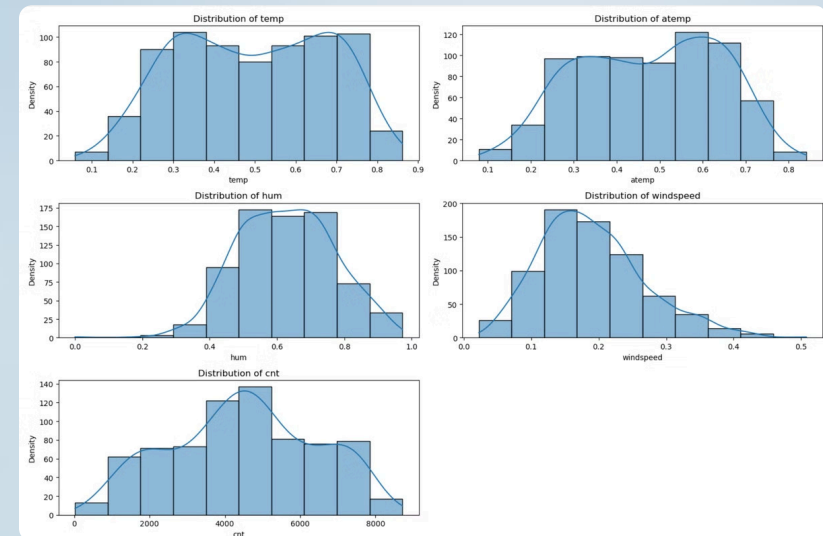
Box Plots

Highlight variability and outliers in data



Data Quality

Clean dataset with no missing values



Seasonal and Temporal Trends

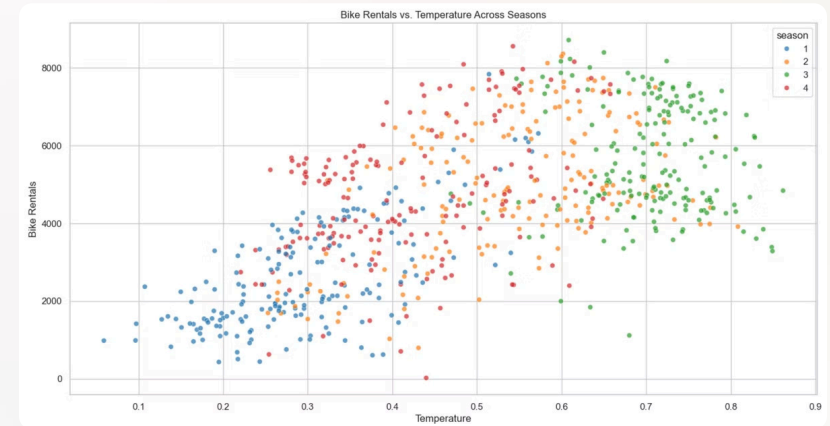
- 1 Rentals by season
- 2 Rentals by month
- 3 Weekday vs. weekend usage patterns.



Influence of Weather on Rentals

1 Strong positive correlation: Rentals vs. Temperature

2 Rentals are highest on warmer days, particularly in Summer and Fall



ANOVA Analysis of Weekday vs. Weekend Rentals

▼ Seasonal Impacts

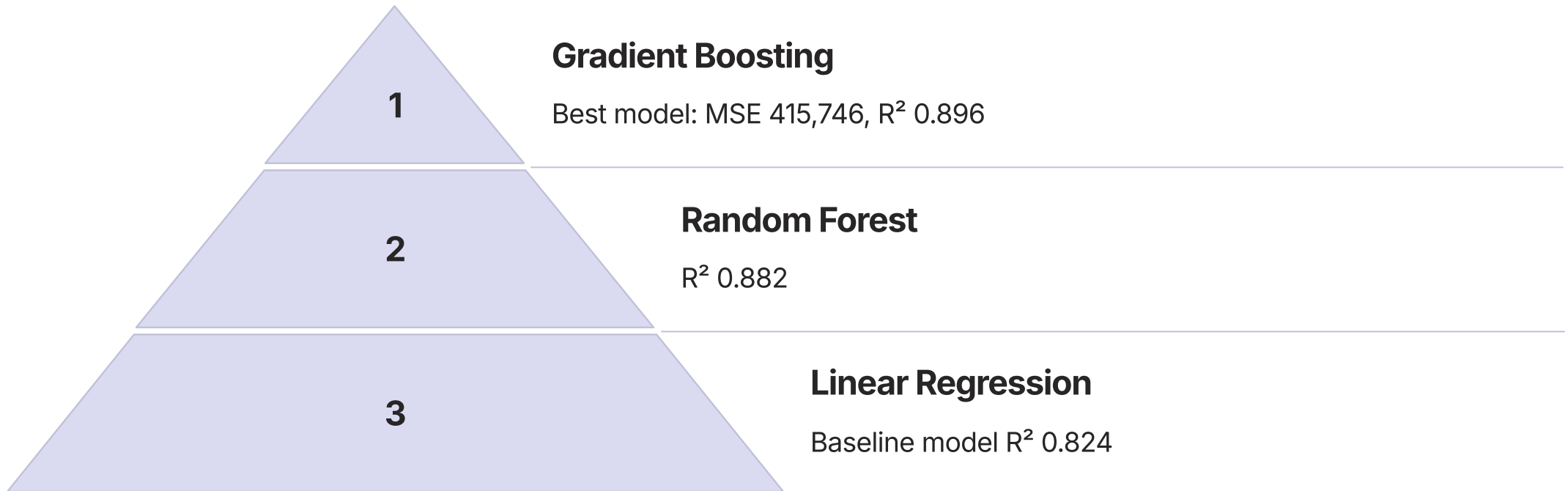
Fall, Spring, Summer

Rental patterns remain consistent (p-value > 0.05)

Winter

Potential impact with p-value of 0.0869

Modeling and Predictions





Conclusion and Future Work

Key Findings

Temperature and seasonal trends dominate rental patterns

Practical Implications

Optimize bike availability in summer, target weekday commuters

Future Research

Analyze hourly data, incorporate external factors