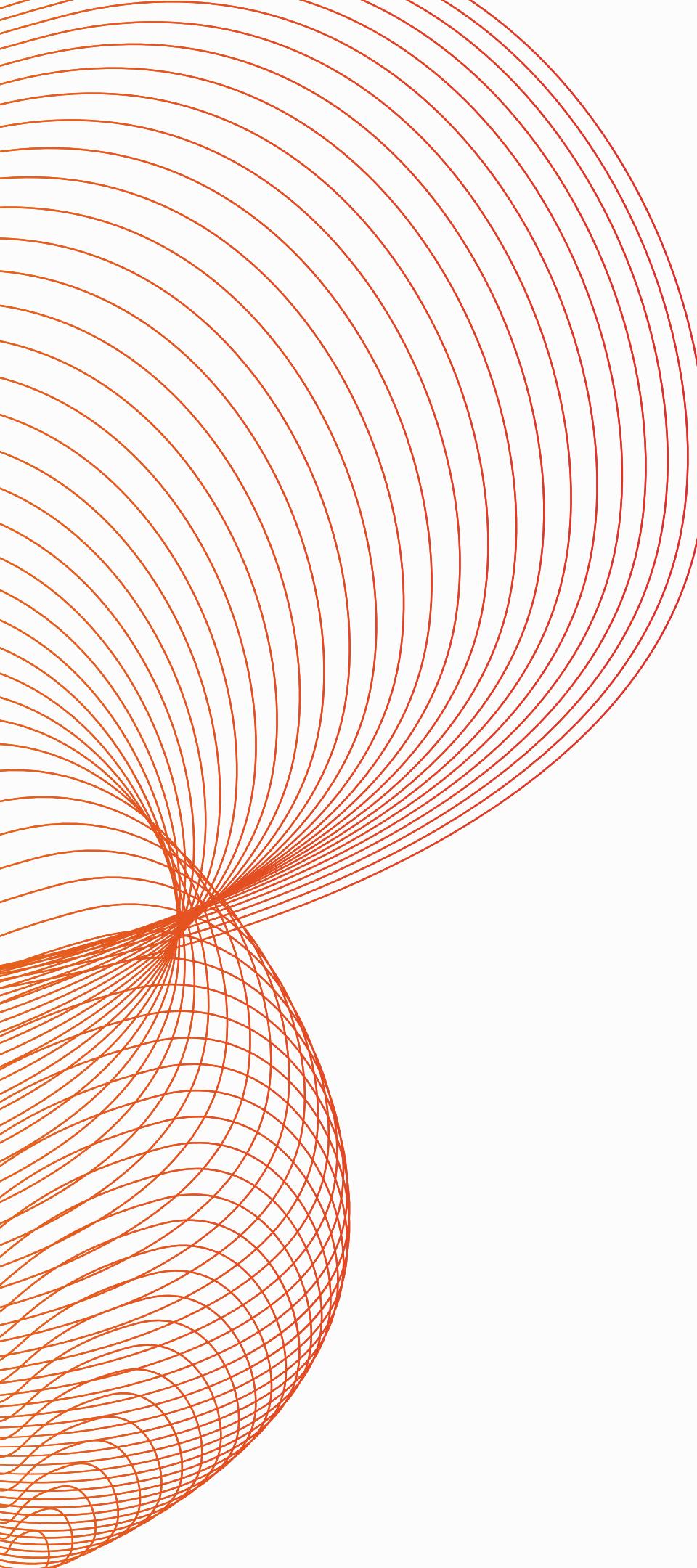


# Forecasting Bike Rentals

Data-Driven Insights

Prepared by Mina Roohnavazfar



# Table of Content

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- Problem Statement
  - Impact of Bridging Data and Decisions
  - Dataset Overview
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  - Data Modeling
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- 

# Forecasting Bike Rentals for a D.C. Station



**Accurately Predicting Hourly Bike Rentals**



**Identifying Peaks and Valleys**

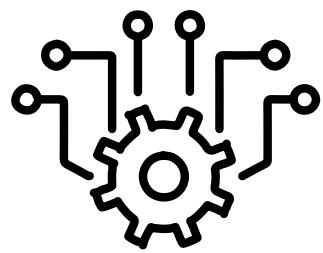


**Utilizing Data Science**



**Enhanced Planning and User Experience**

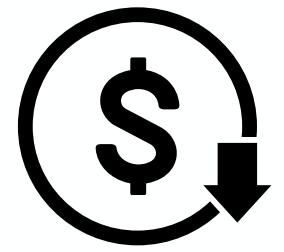
# Benefits of Bridging Data and Decisions



Optimized Resource Allocation



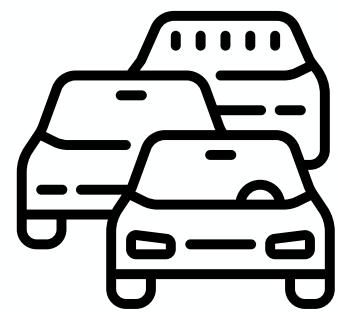
Enhanced User Experience



Reduced Operational Costs



Economic Benefits



Traffic and Environment Impact

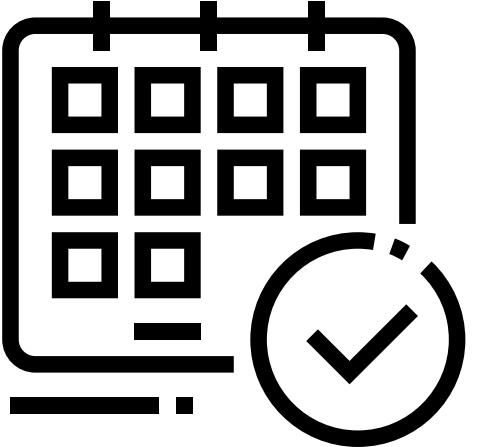


Better Marketing and Promotion

# Dataset Overview



## Features



- Date
- Year
- Season
- Month
- Day
- Hour
- Holiday
- Weekday
- Working Day



- Weather Situation
- Temperature
- Feeling Temperature
- Humidity
- Wind Speed

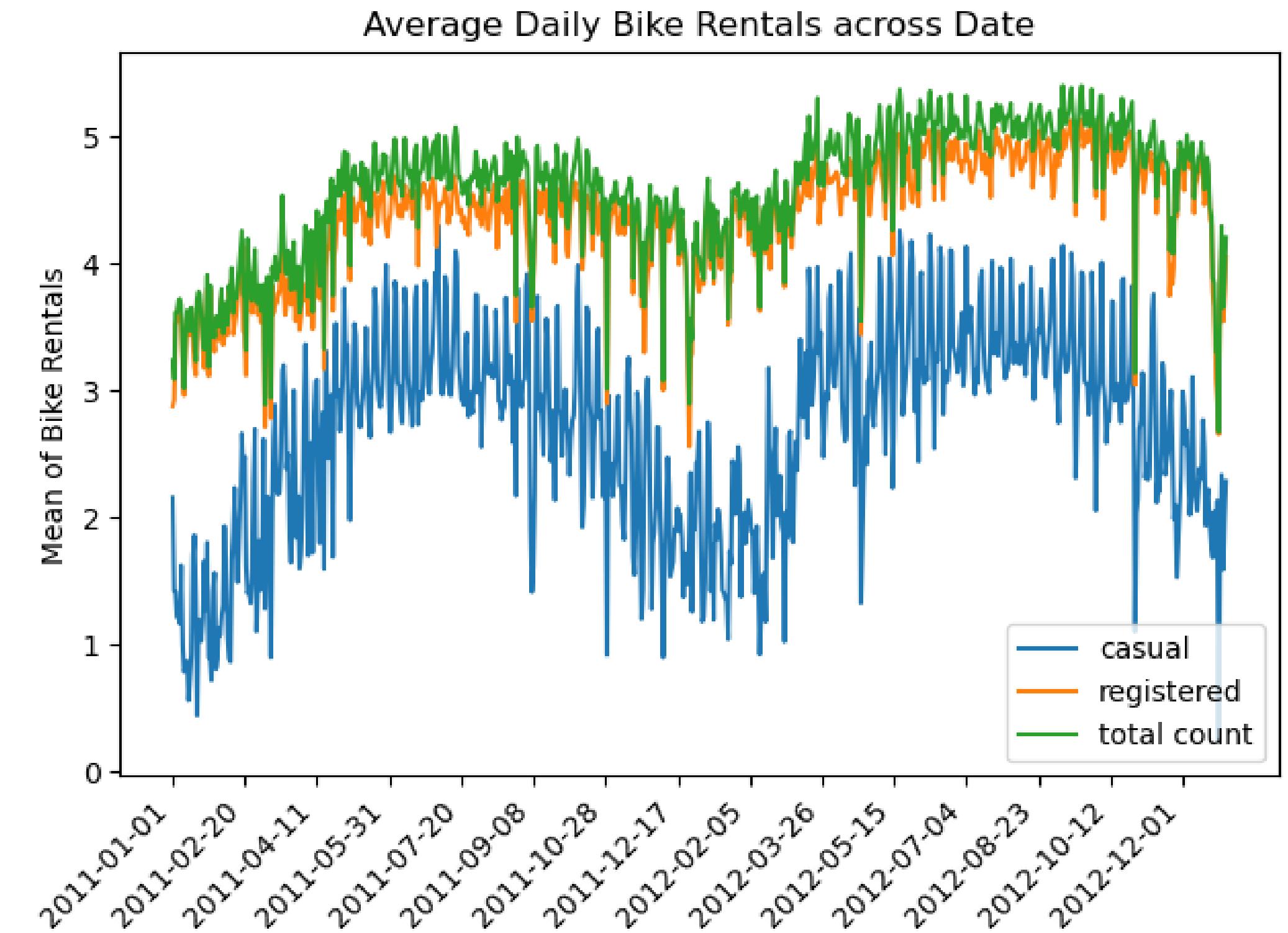


## Target Variables

- Casual User Bike Rental
- Registered User Bike Rental
- Total Count

# EDA Finding

- Bike Rental Patterns by User Type
- Yearly Analysis
- Monthly Analysis
- Seasonality
- Overall Trend



# DATA MODELING APPROACHES



- 1 Linear Regression
- 2 Non Linear Regression
- 3 Neural Network
- 4 Decision Tree

# Evaluation Metrics



Percentage Mean Absolute Error  
(PMAE)



Percentage Root Mean Square  
Error (RMSE)



R-squared

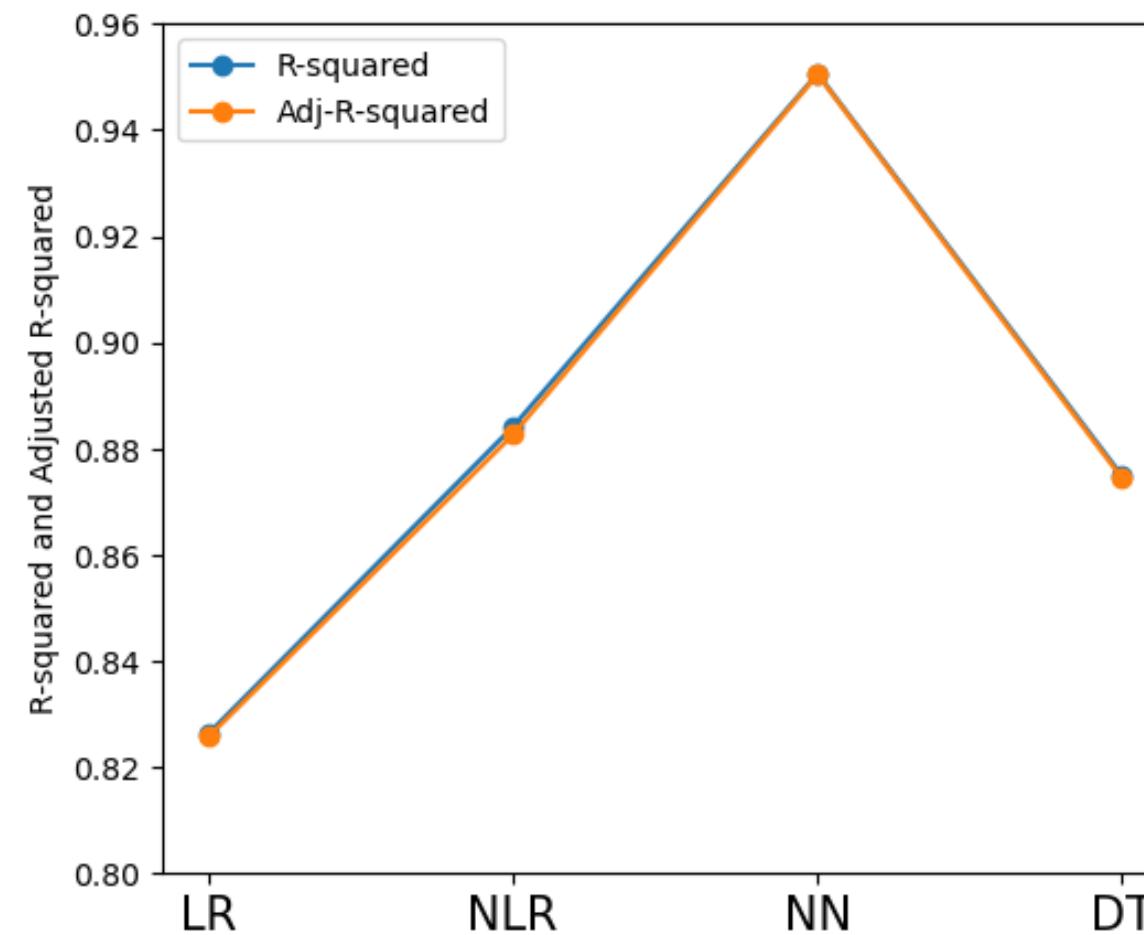


Adj-R-squared

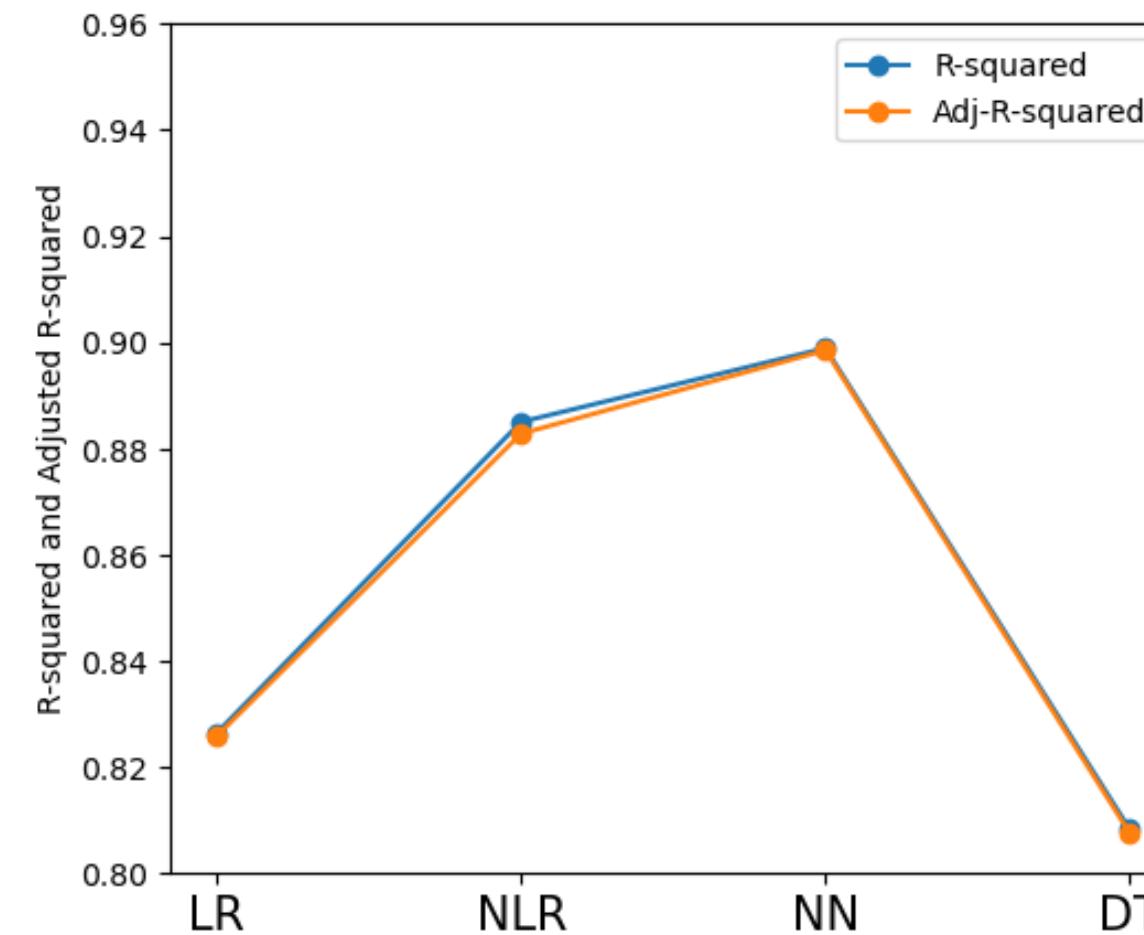


# R-Squared Comparison of Models

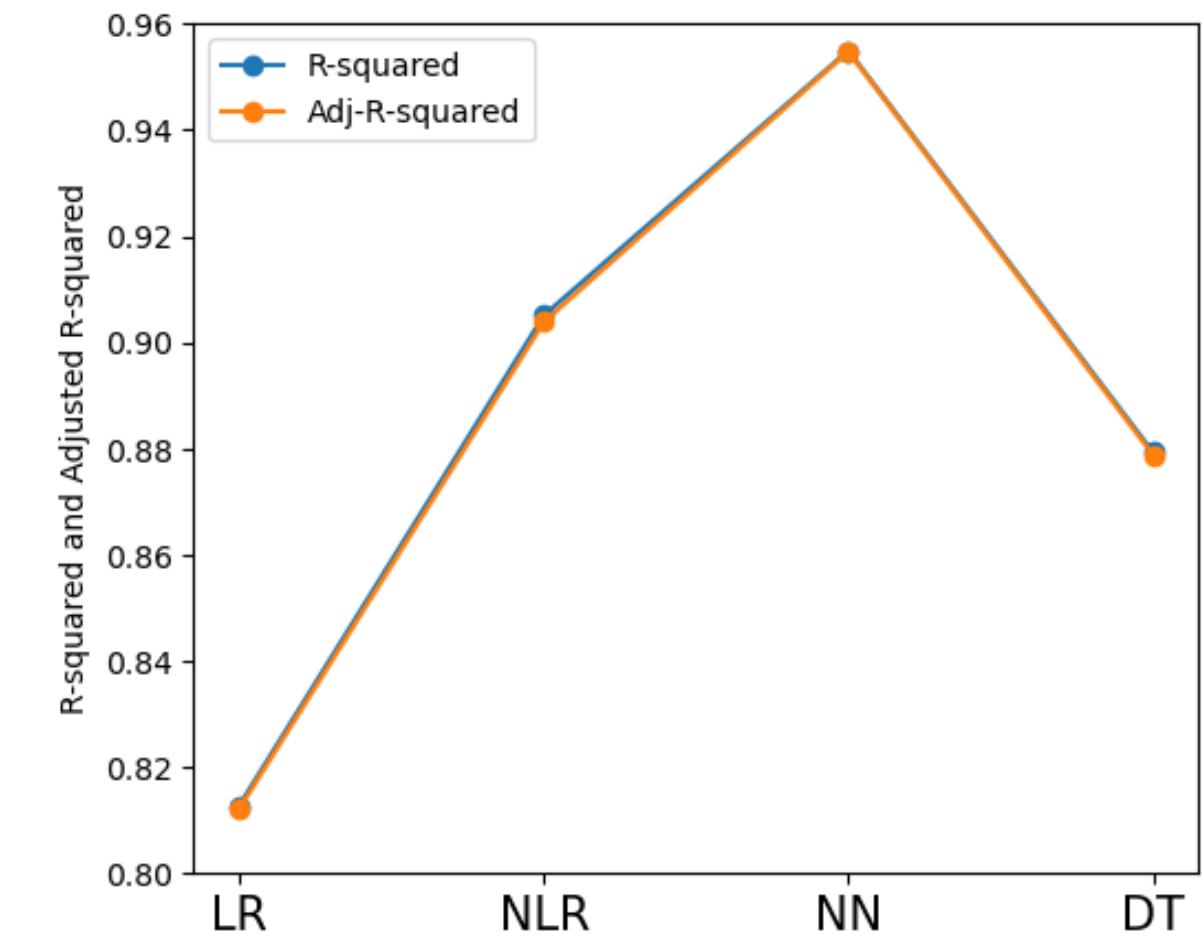
Total Count Target Variable



Casual Users Target Variable

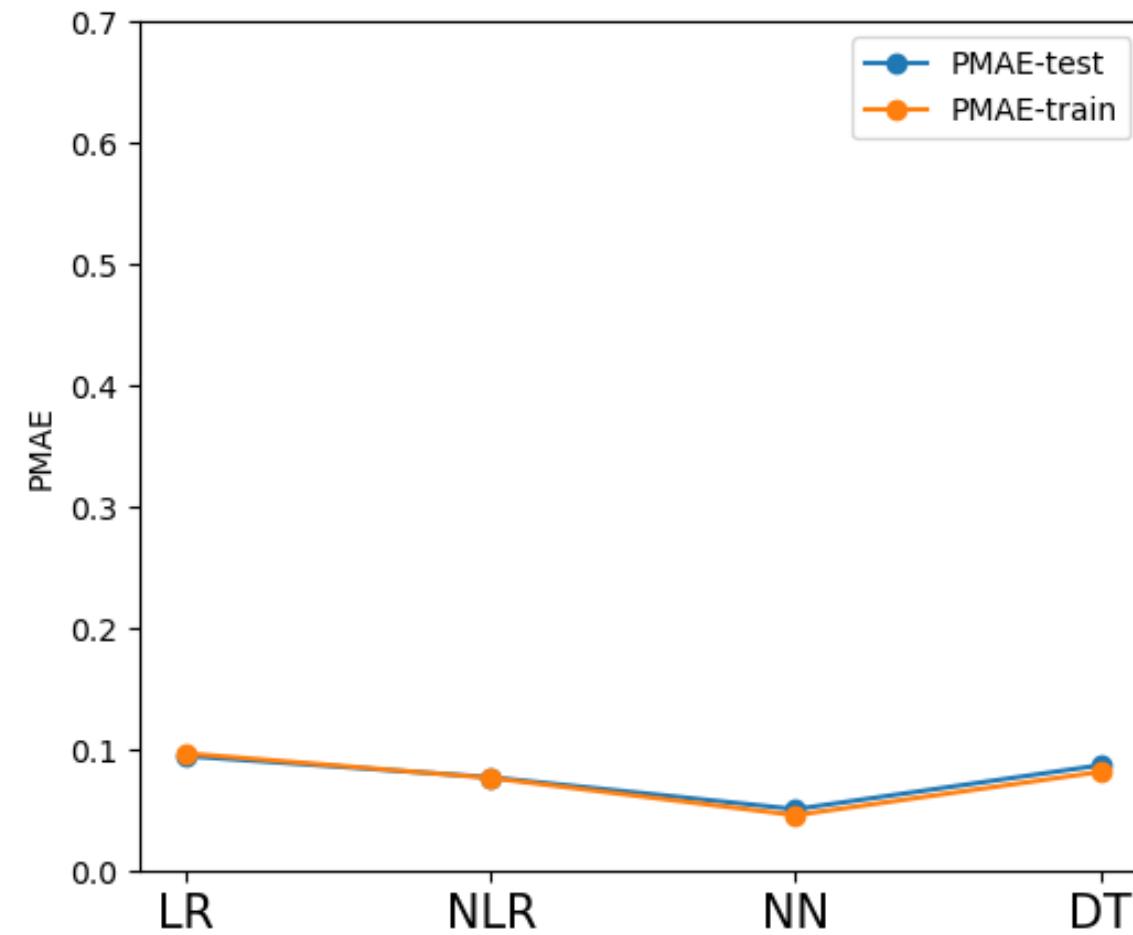


Registered Users Target Variable

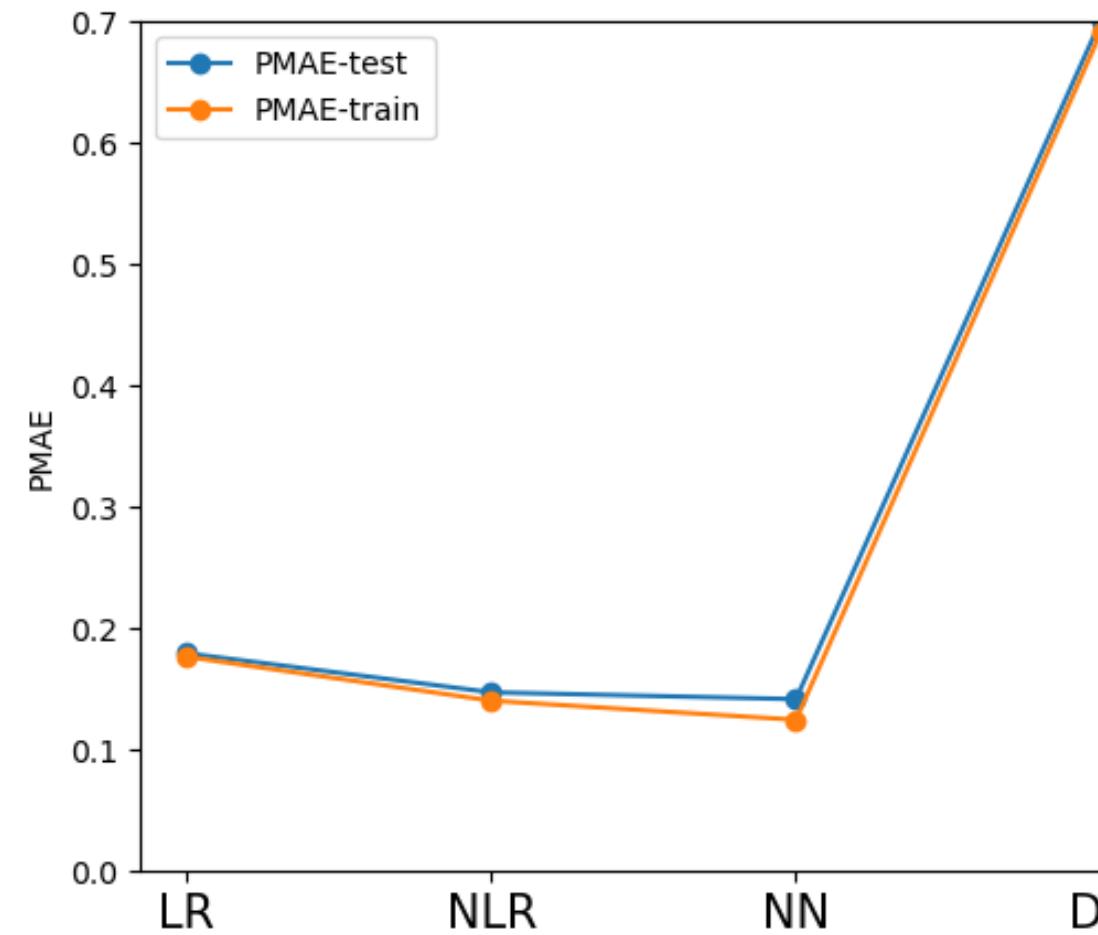


# PMAE Comparison of Models

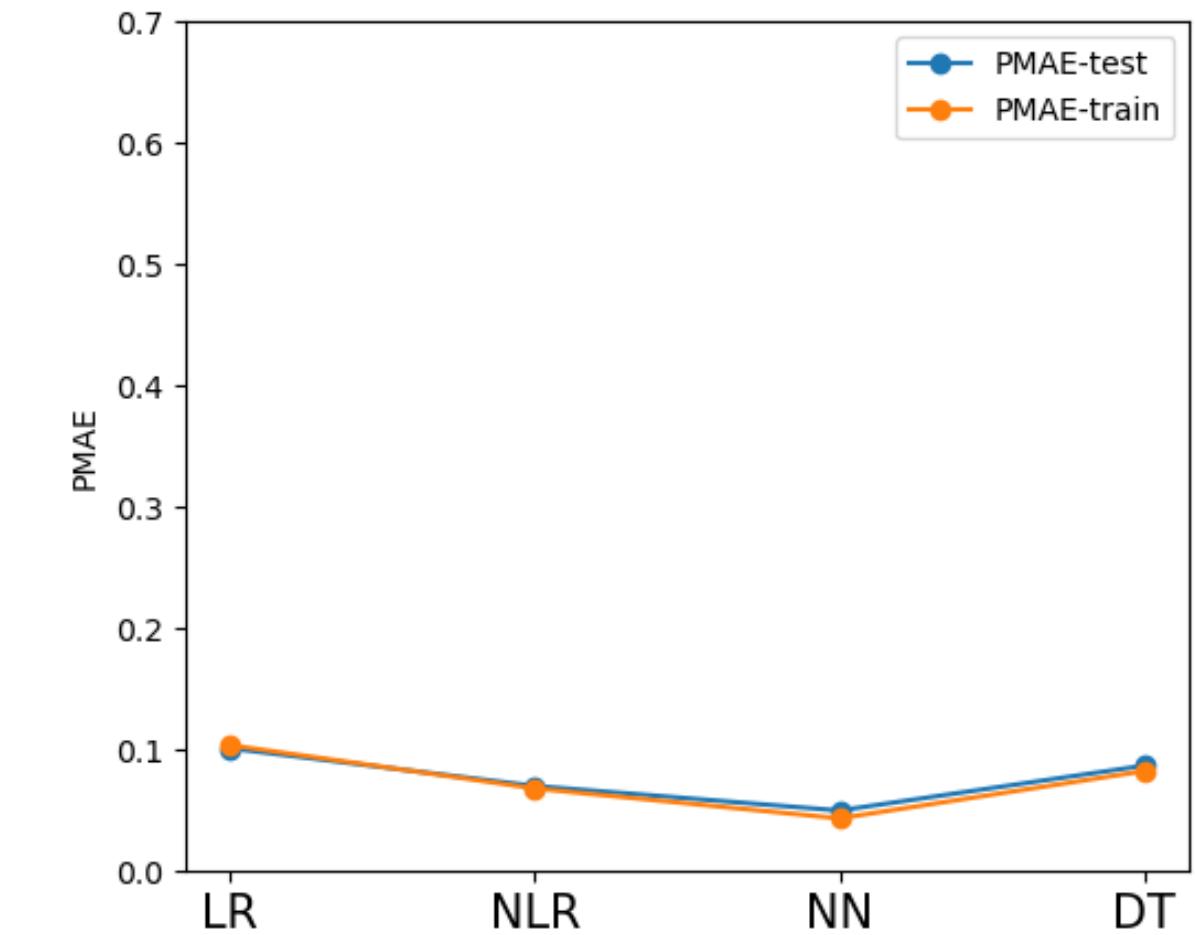
Total Count Target Variable



Casual Users Target Variable

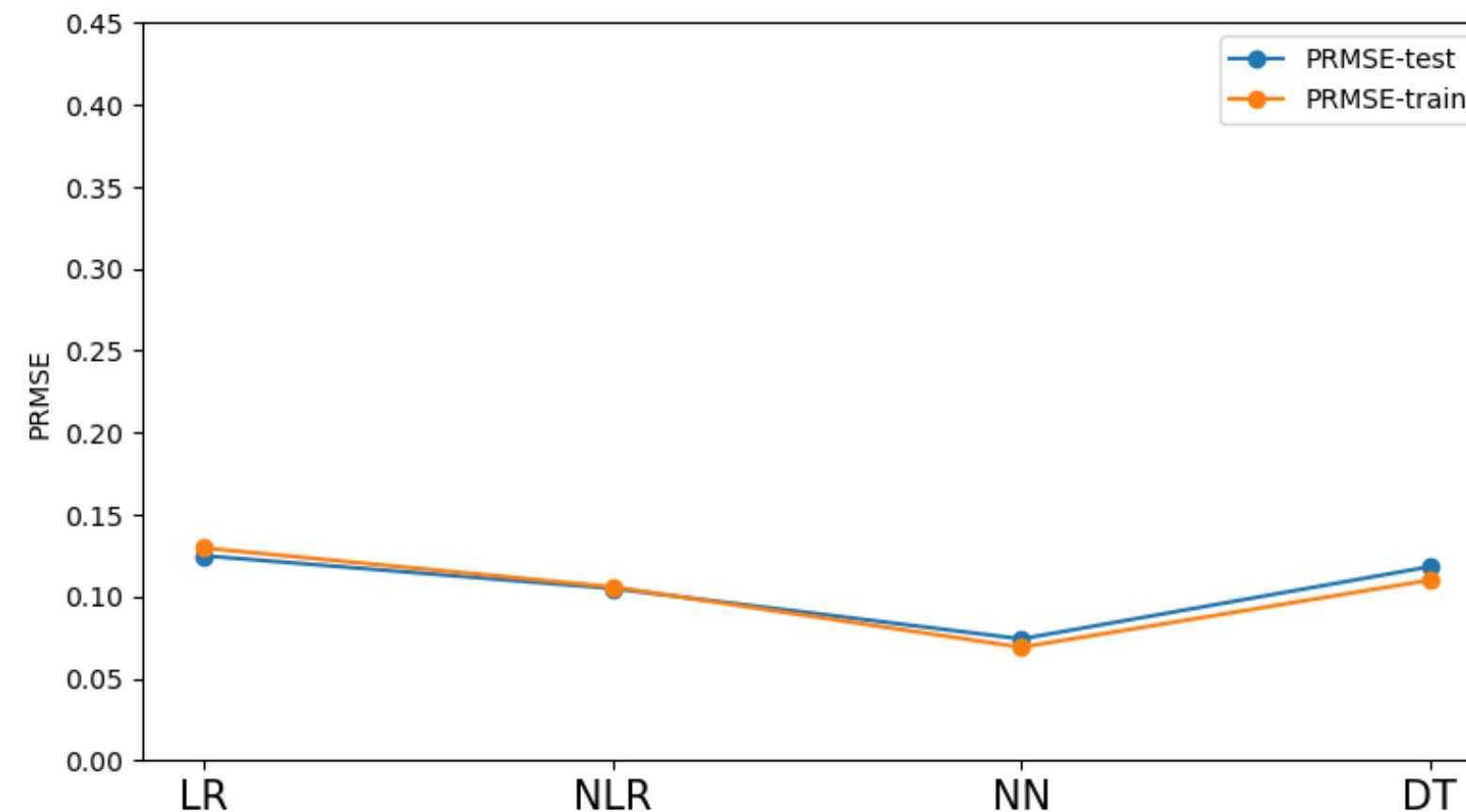


Registered Users Target Variable

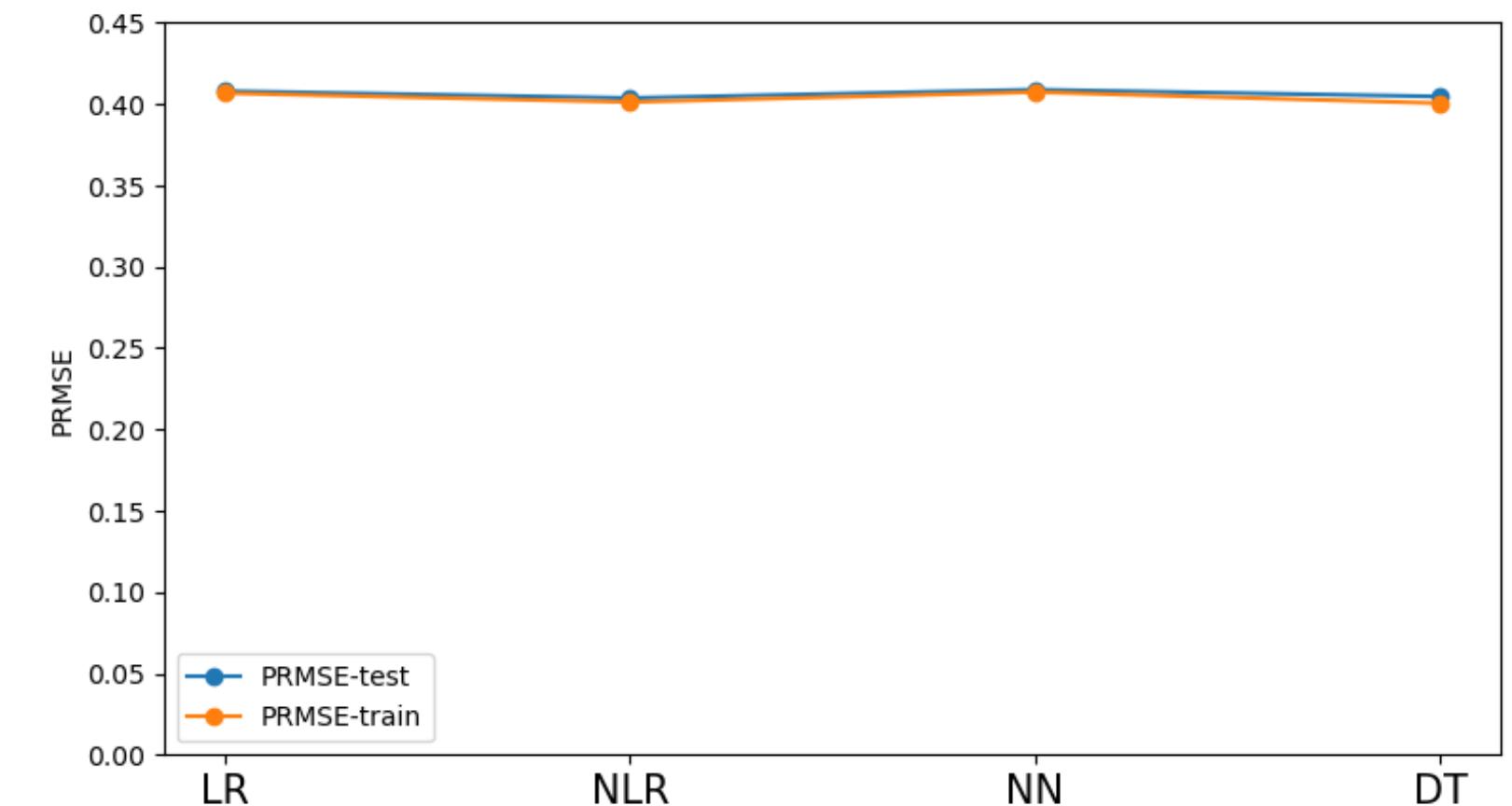


# PRMSE Comparison of Models

Total Count



Casual + Registered



# Next Steps



- Applying Ensemble Methods
- Time Series Modeling
- PCA
- Feature Importance Analysis
- Advanced Model Evaluation



# THANK YOU

FOR YOUR ATTENTION

