MODEL TO PREDICT HOURLY COUNT OF BIKE RENTED IN COMPANY-X

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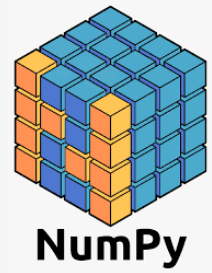
PROJECT DESCRIPTION

Build a model that can predict hourly demand and identify how different features influence the decision. Please explain the findings effectively to technical and non-technical audiences using comments and visualizations, if appropriate.

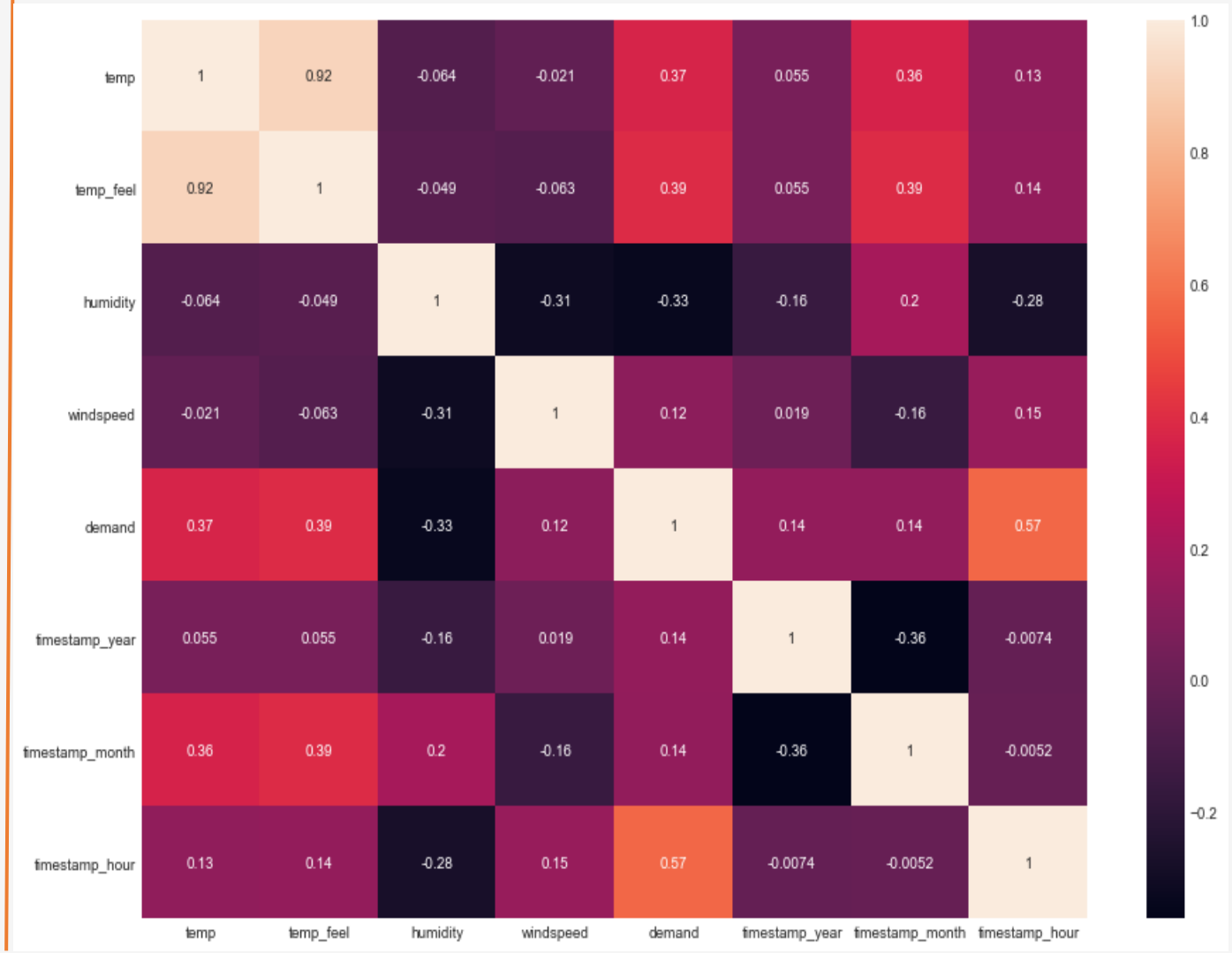
Data Description

Column	Description
id	Record index
timestamp	Datetime (YYYY:MM:DD HH AM/PM)
season	Season (spring, summer, fall, winter)
holiday	Whether day is a holiday or not (Yes or No)
workingday	Whether day is a working day or not (Yes or No)
weather	Weather condition (Clear or partly cloudy, Mist, Light snow or rain, heavy rain/ice pellets/ snow + fog
temp	Average temperature recorded for the hour (in degree Celsius)
temp_feel	Average feeling temperature recorded for the hour (in degree Celsius)
hum	Average humidity recorded for the hour (in %)
windspeed	Average wind speed recorded for the hour (in miles/hour)
demand	Hourly count of bikes rented

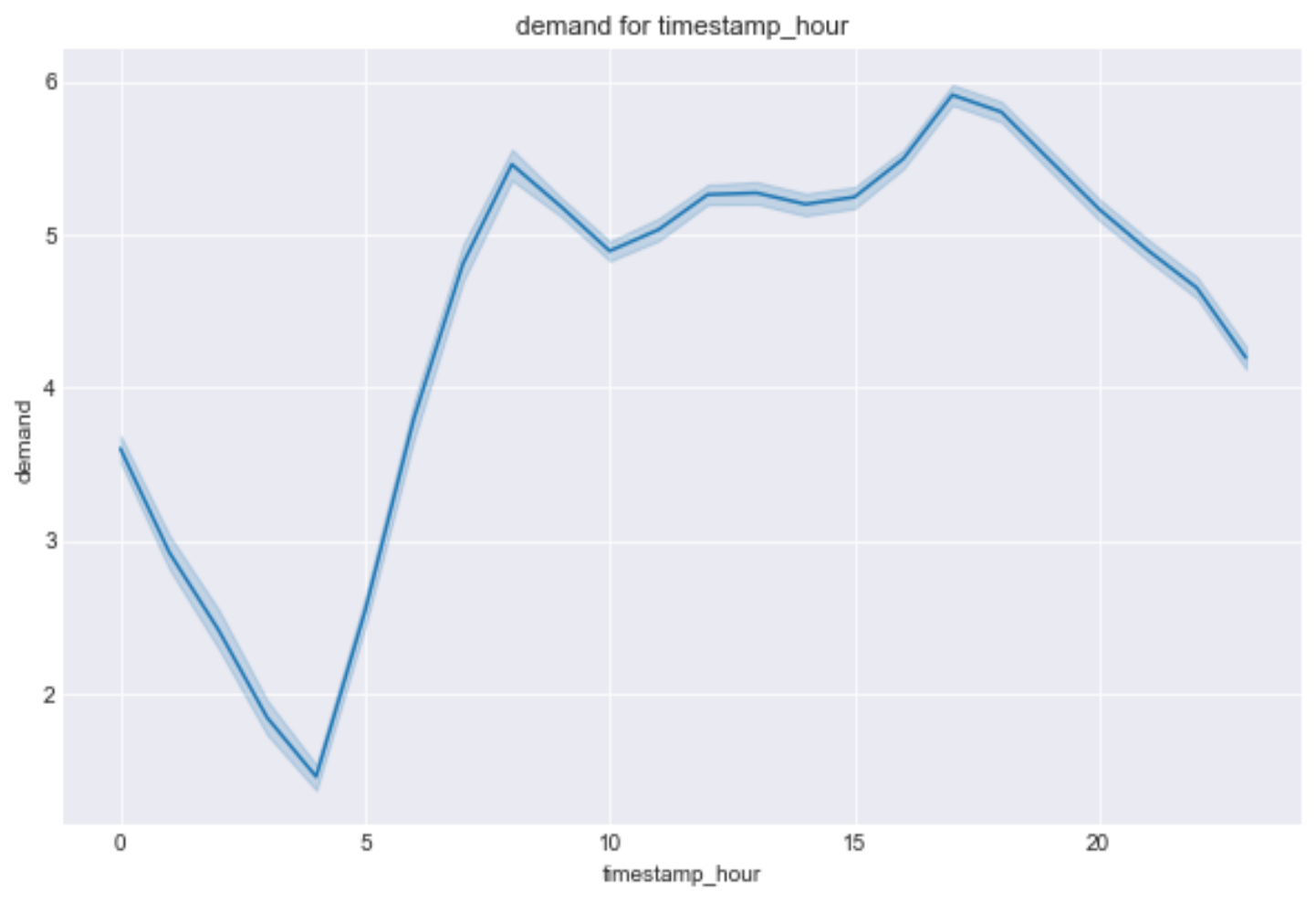


Data Cleaning/Exploratory Analysis

1. Check for missing and duplicate data
2. Dealing with timestamp column
3. Check Features Correlation with target Variable
4. Exploratory Data Analysis

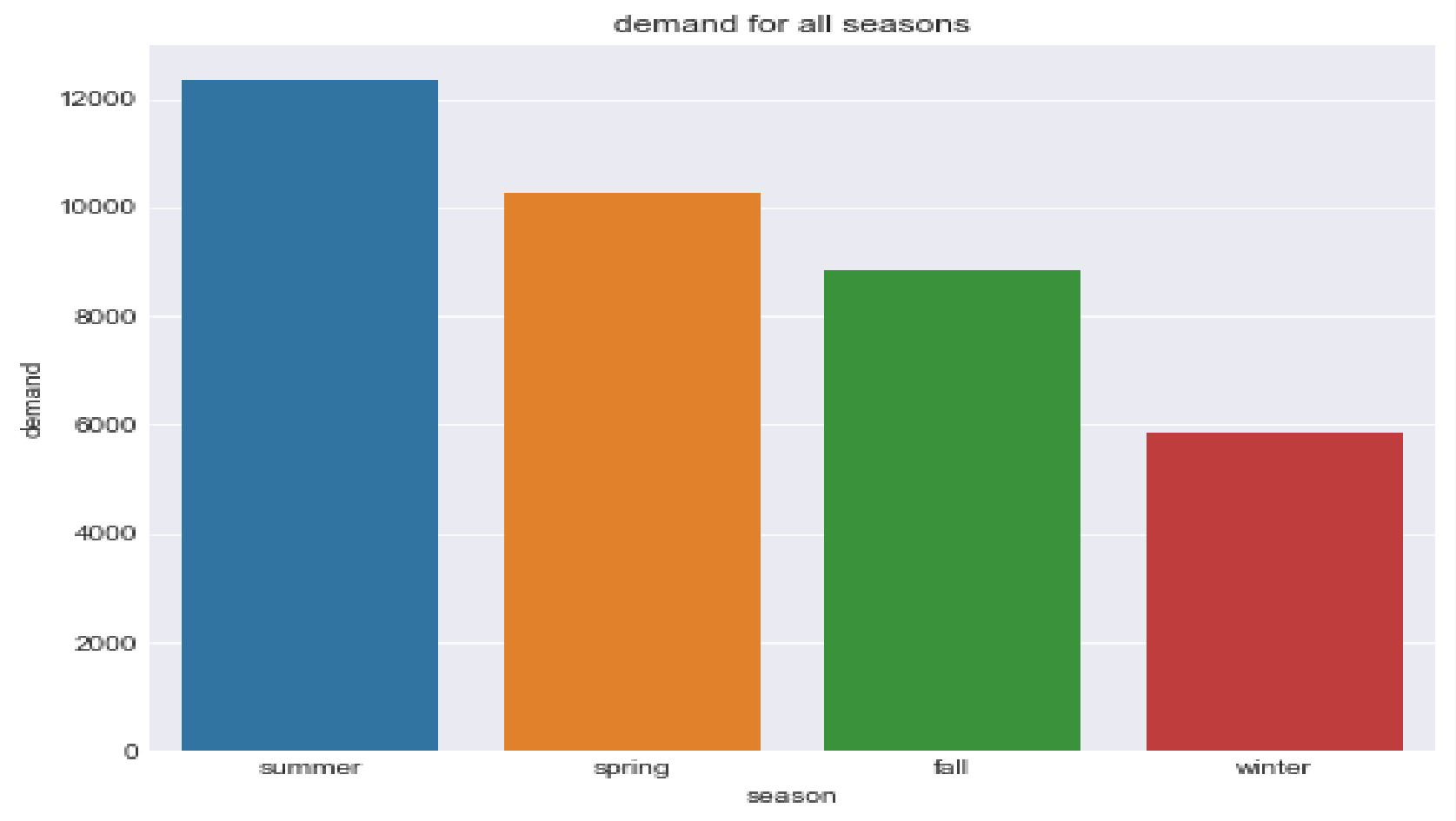


DEMAND VS TIMESTAMP (HOURS)

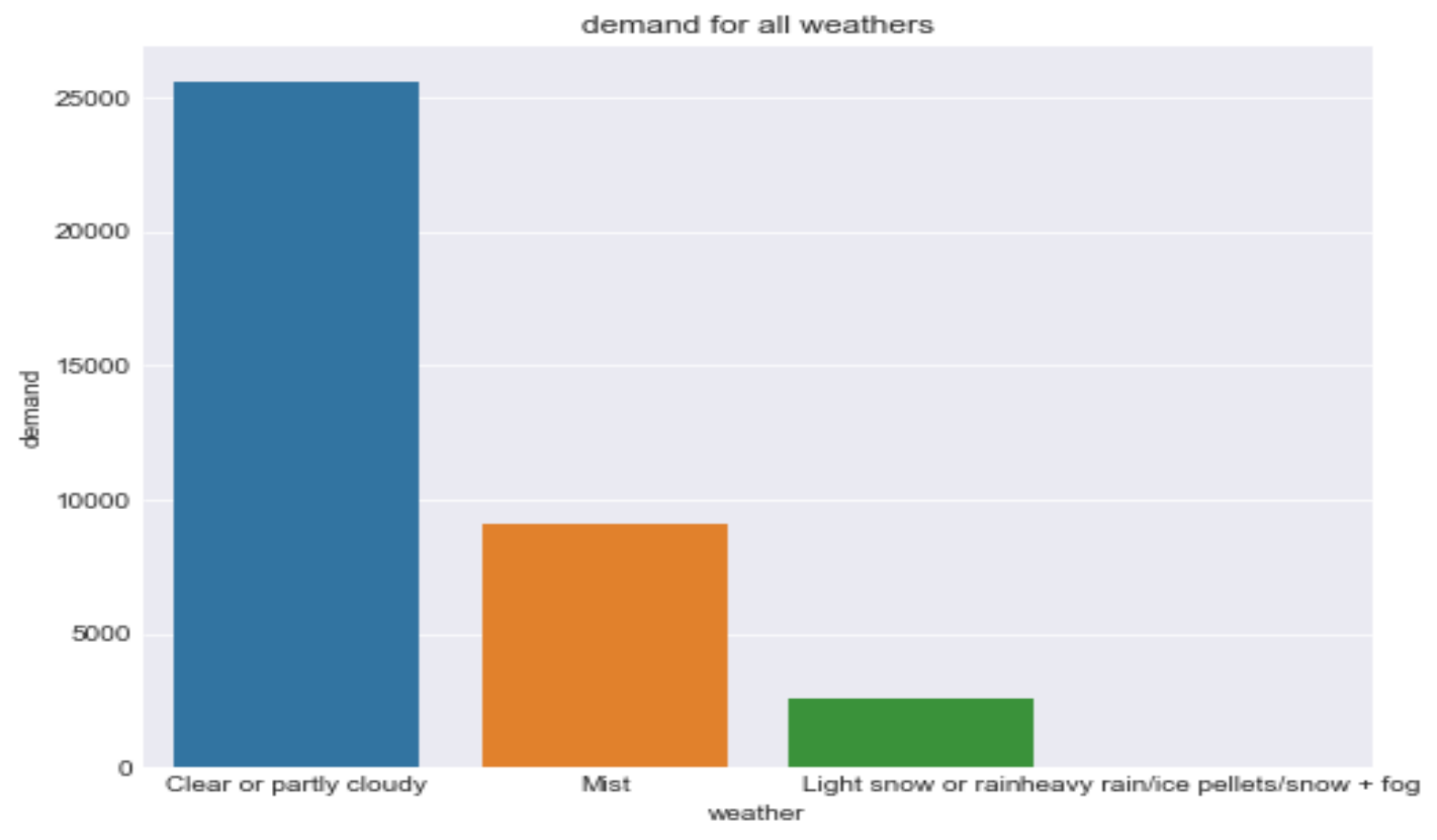


Bikes are rented mostly fr0m 16-17hours, this is around 4-5pm in the evening. Also, there is high demand in the morning hours, around 8am

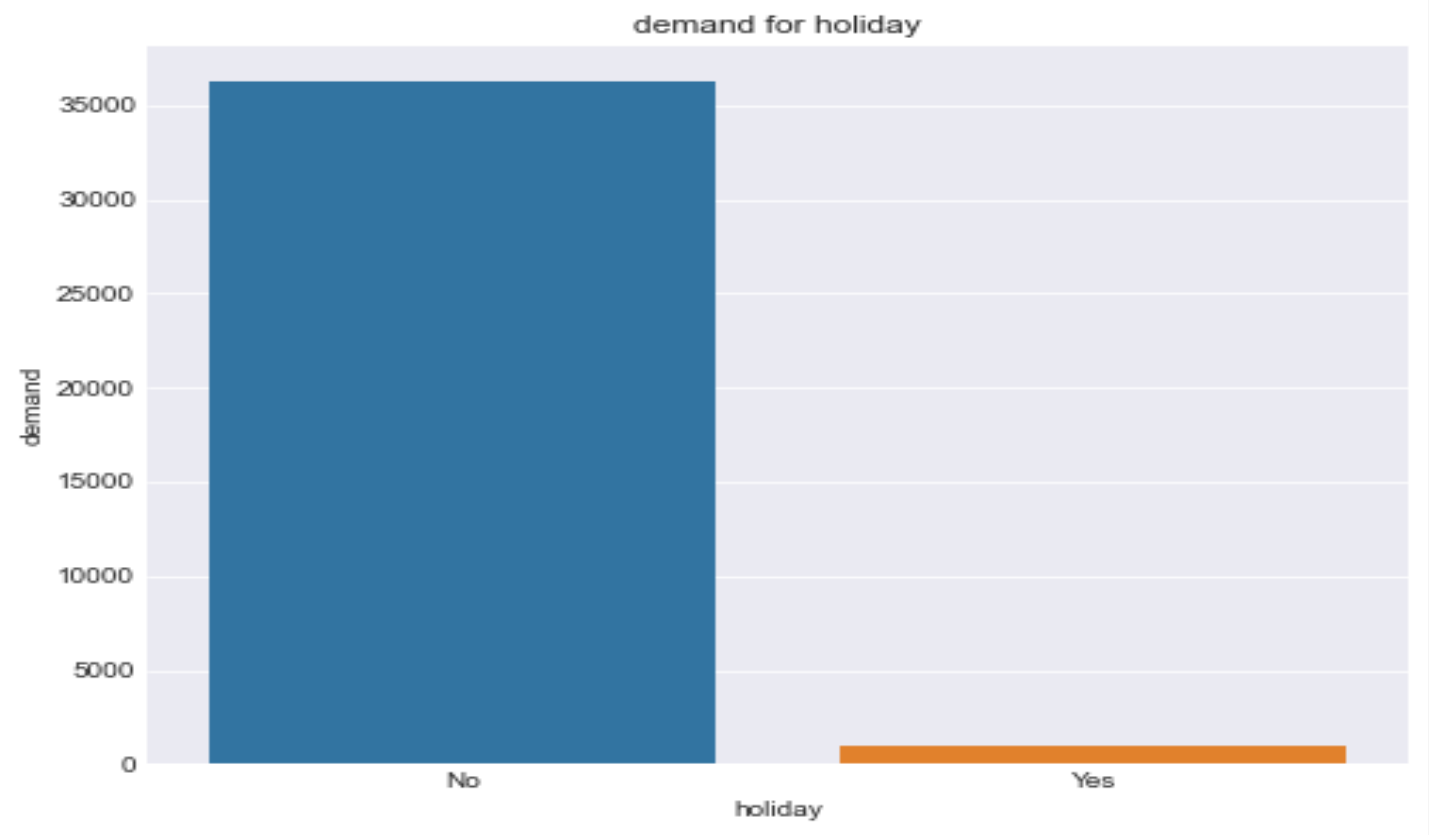
DEMAND ACROSS SEASONS



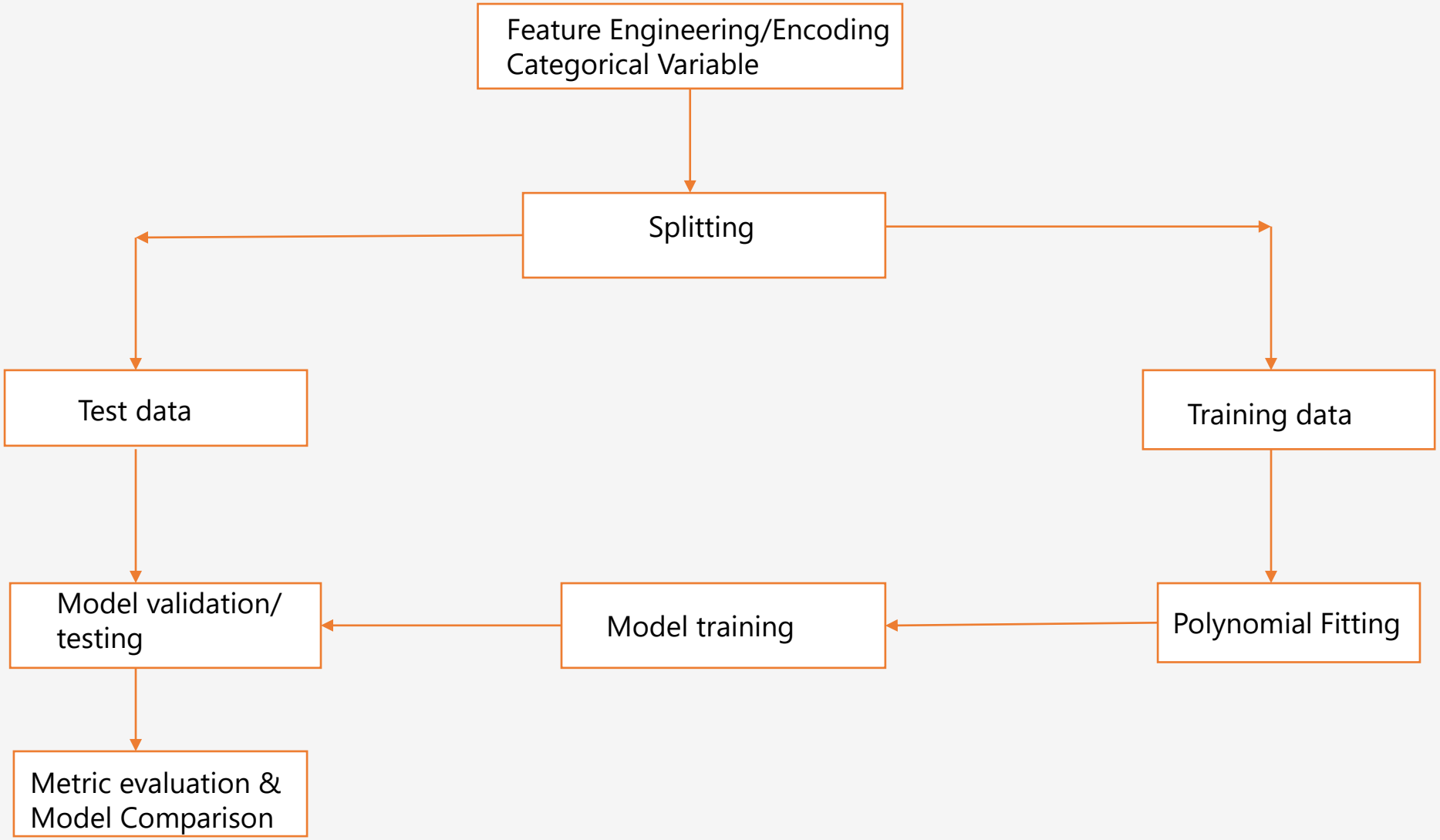
DEMAND ACROSS ALL WEATHER



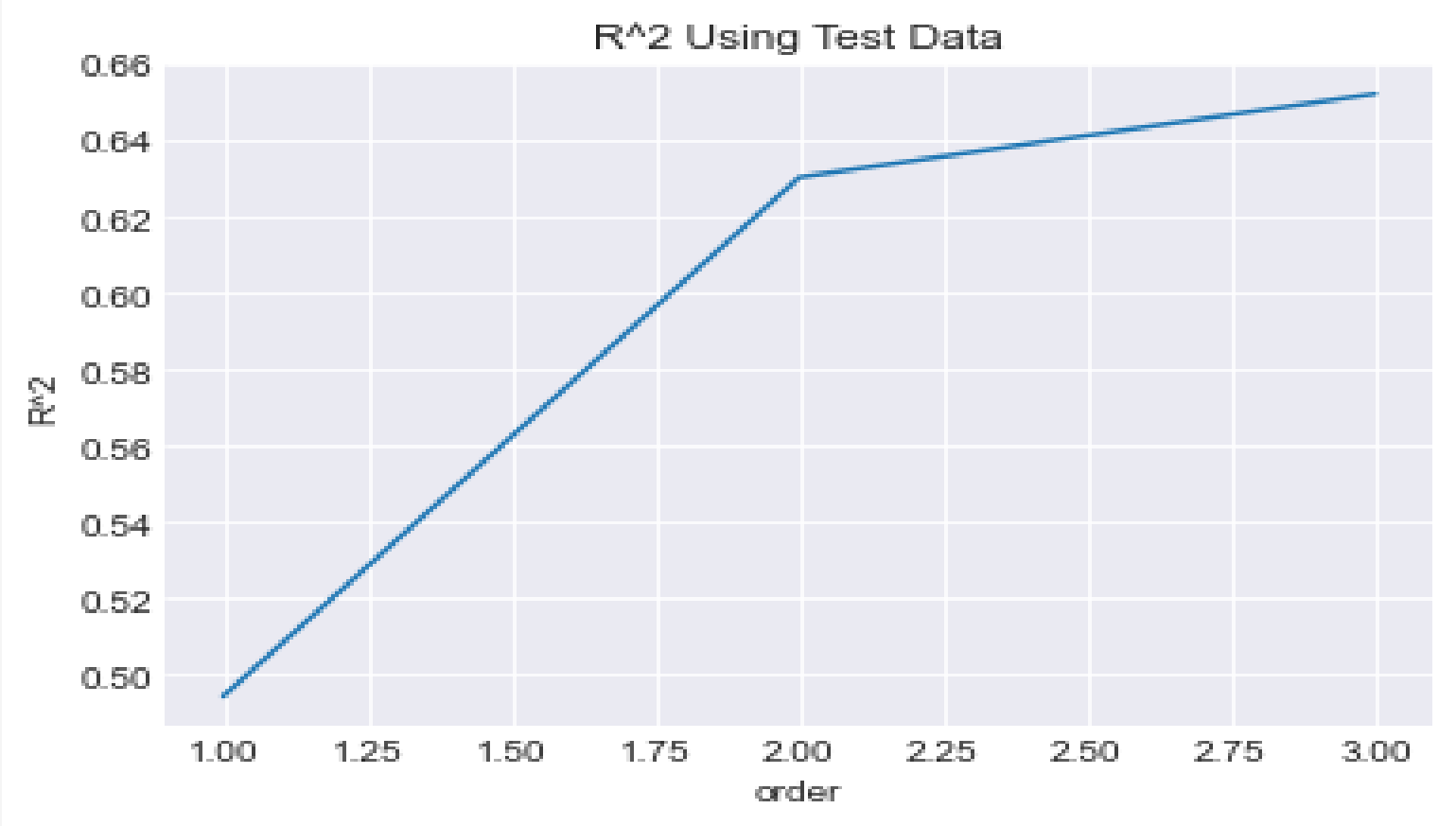
DEMAND ON HOLIDAYS AND NON HOLIDAYS



MODEL TRAINING AND EVALUATION



POLYNOMIAL ORDER FOR BEST FIT MODEL



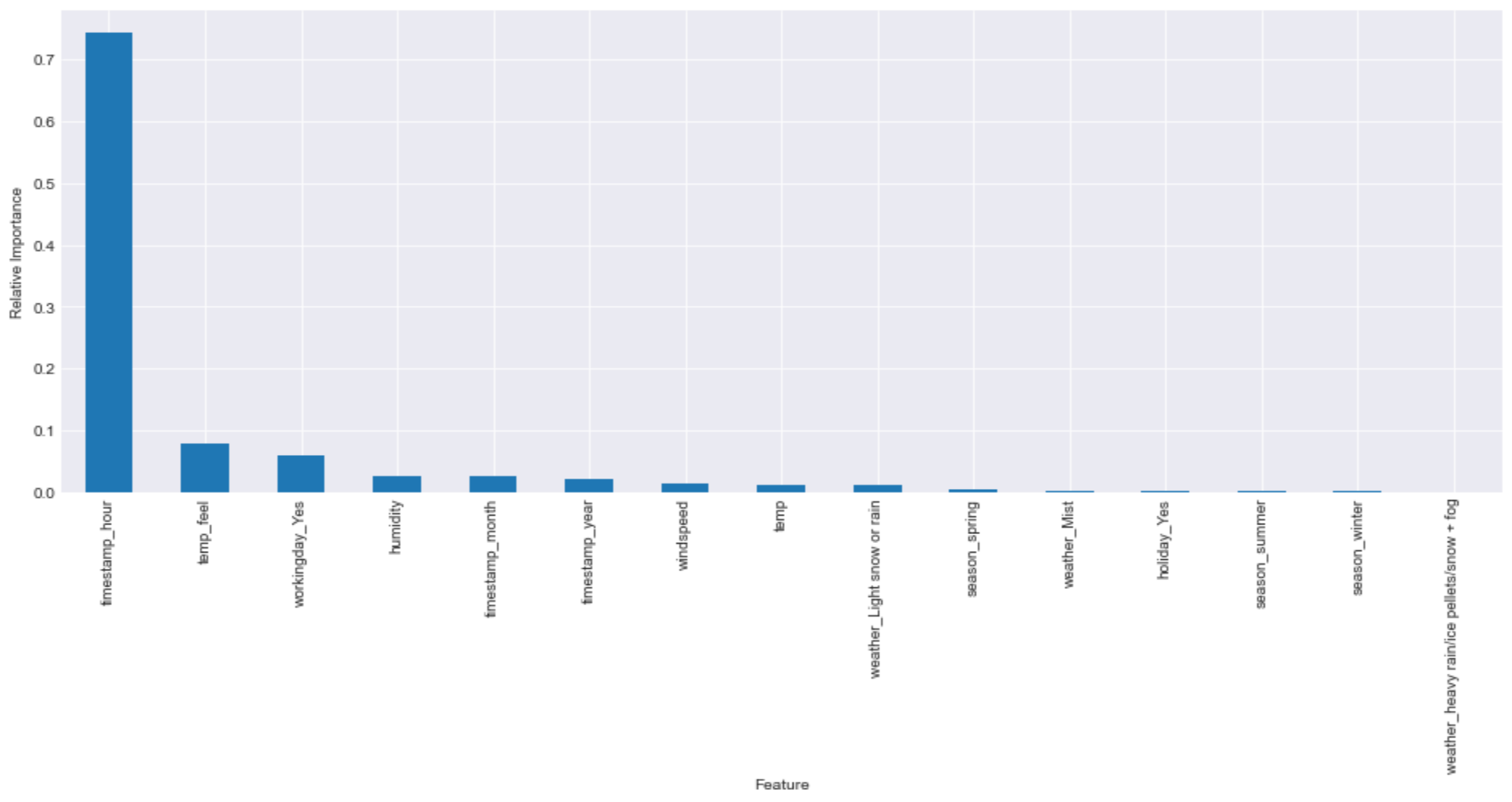
Regression Models Tested

- Linear Regression
- Decision Tree Regressor
- Random Forest Regressor
- Extra Tree Regressor

METRIC EVALUATION AND MODEL COMPARISON

Metric	R^2 score
Linear Regression	0.652
Decision Tree Regressor	0.880
Random Forest Regressor	0.939
Extra Tree Regressor	0.941

FEATURE IMPORTANCE



KEY FINDINGS FROM ANALYSIS

- Demand fOR bikes are higher in the evening period of the day, between 4-5pm, there's also a good demand by 8am
- There is more demand in summer than other seasons and least demand in winter
- Bikes are rented more when the weather is clear or partly cloudy
- There is very low demand on holidays
- Polynomial of order 3 is the best for the model
- Extra tree Regressor gave the best fit for the model
- Predictions has a score of 94% using the r^2 metric
- The hour of the day is the most important feature in the model