IDENTIFYING FACTORS FAVORABLE TO DEMAND FOR BIKE RENTALS

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AGENDA

- INTRODUCTION
- DATA
- ANALYSIS
- CONCLUSION

AGENDA

INTRODUCTION

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CONCLUSION

CLIENT

US bike rental and sharing service provider, BestBikes, has decided to create a new business plan to improve its revenue post COVID.

Company wants to analyze the demand for shared bikes and understand the factors affecting the demand.

Results will be utilized to change the business strategy.

BUSINESS CASE

PROBLEM STATEMENT

To analyze demand for bike sharing and rental using the independent factors

VALUE PROPOSITION

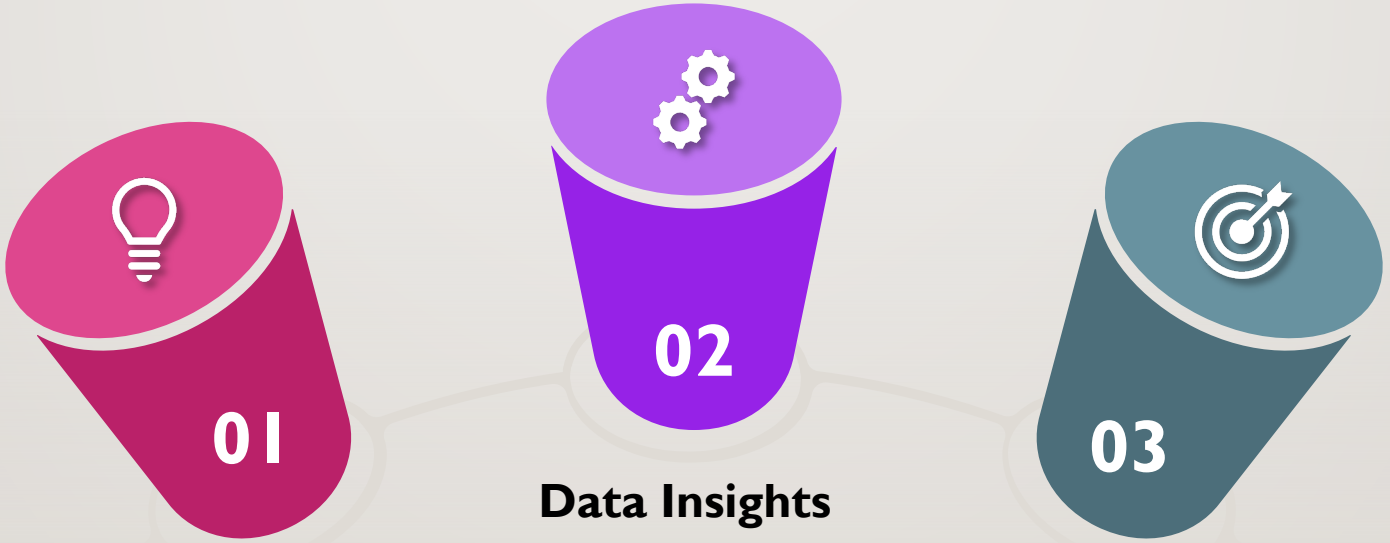
To focus on the significant factors to predict the demand and and operate in the most profitable manner possible.

IMPACT HYPOTHESIS

The hypothesis that connects the analysis with the business plan is:

" Higher temperature and less windspeed will be favorable to the demand for bike rentals".

SOLUTION PATHS



Regression Analysis

- To understand the relationship between variables
- To focus on significant factors

Data Insights

- Visualizations
- Pivot Tables

Interactive Dashboards

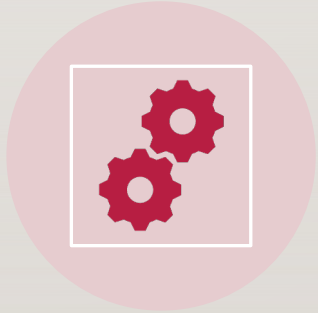
- To understand the impact of one factor on the whole dataset

MEASURES OF SUCCESS

Increase in top line revenue

Reduction in operating cost

Maximize Capacity utilization



Resource optimization

RISKS & ASSUMPTIONS

Regulatory Changes

No new regulatory changes impacting use & accessibility to bicycles

COVID

No rise in new COVID variant and subsequent lockdowns impacting free movement

Weather

No significant change in weather pattern effecting use of bicycles

Transportation

No major change in availability & accessibility of other mode of transportation

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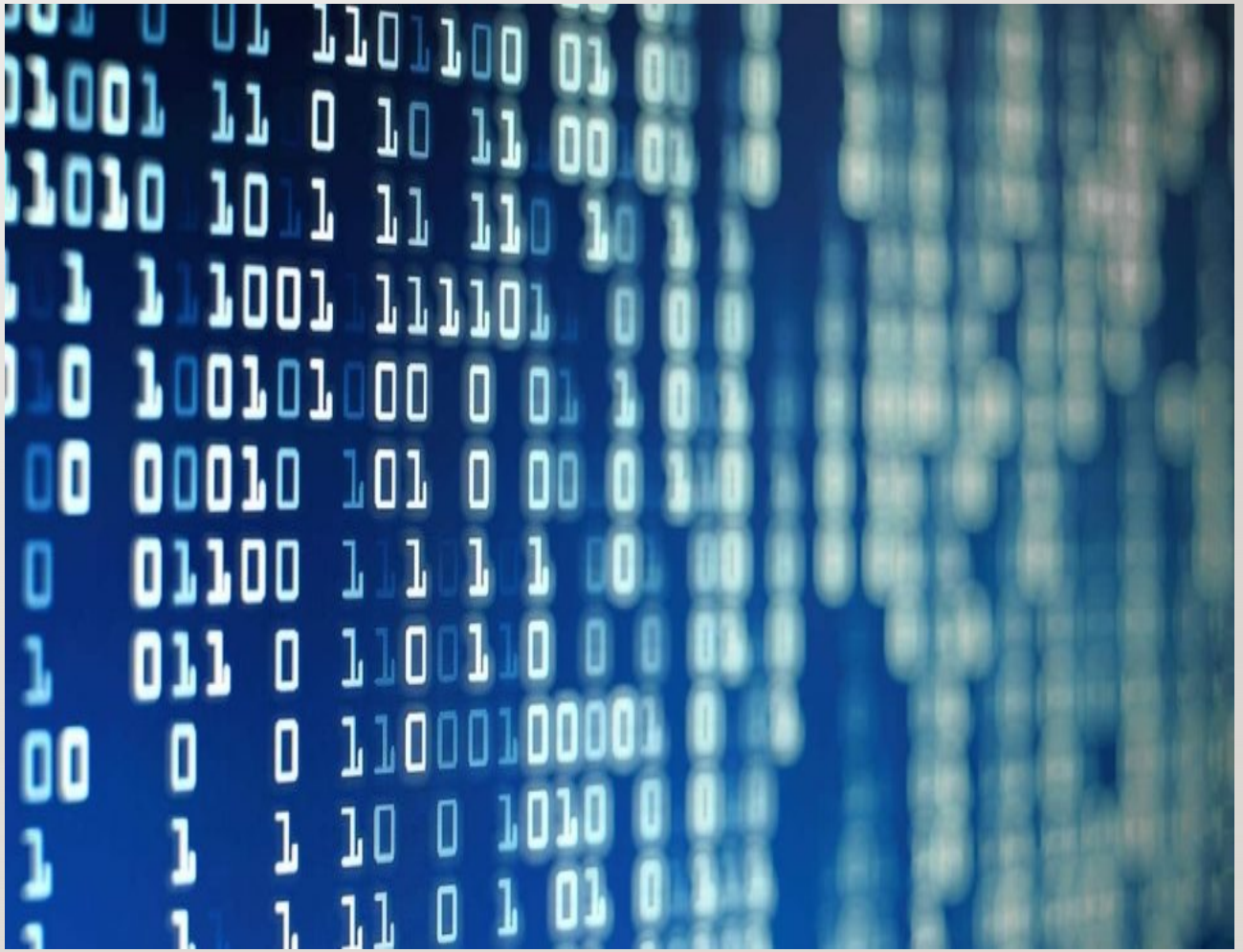
DATA

DATA

- Data was obtained from this UCI repository - https://archive.ics.uci.edu/ml/datasets/bike+sharing+dataset.

- Contains the daily count of rental bikes between years 2018 and 2019 with the corresponding weather and seasonal information.



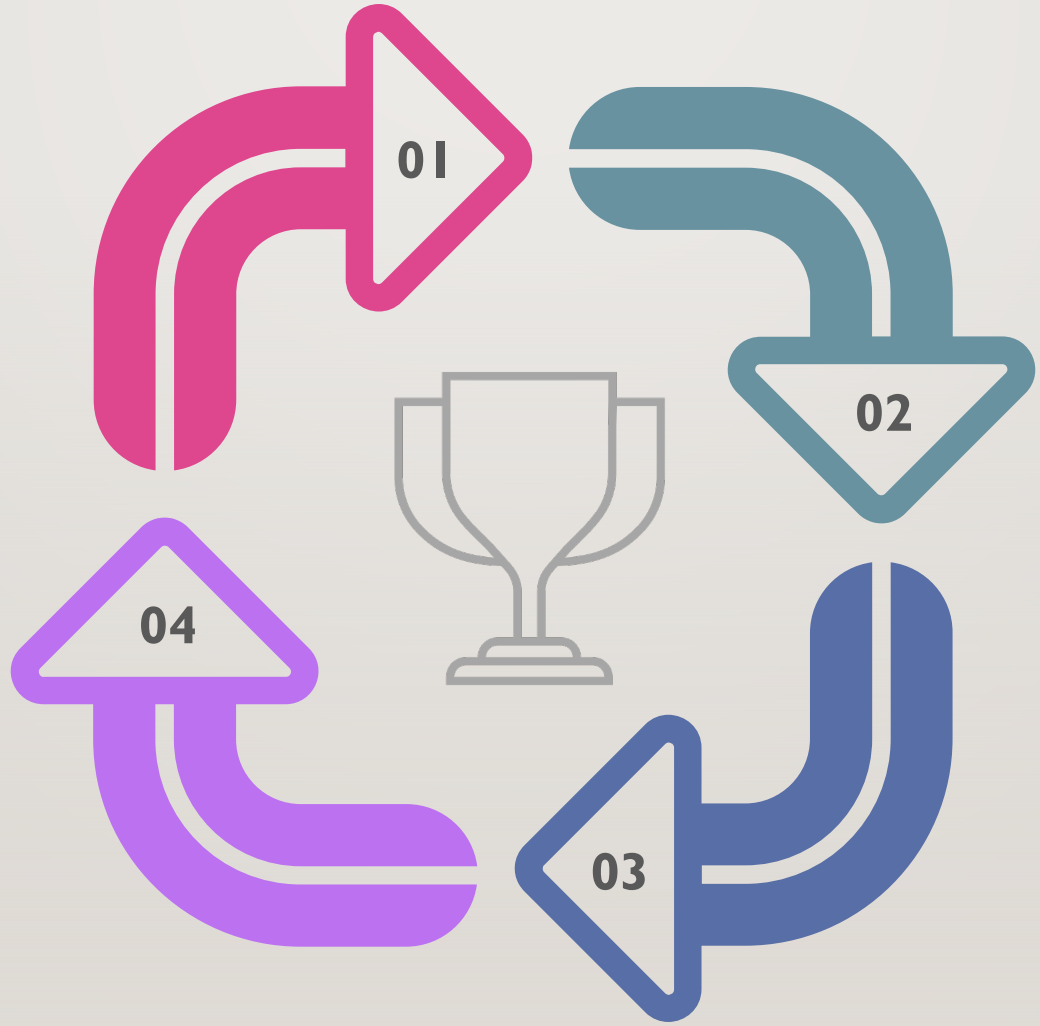
METHODOLOGY

Data

- Downloaded the data from the website and explored to understand it better

Tableau

- Utilized Tableau to create sophisticated visualizations and interactive dashboards.



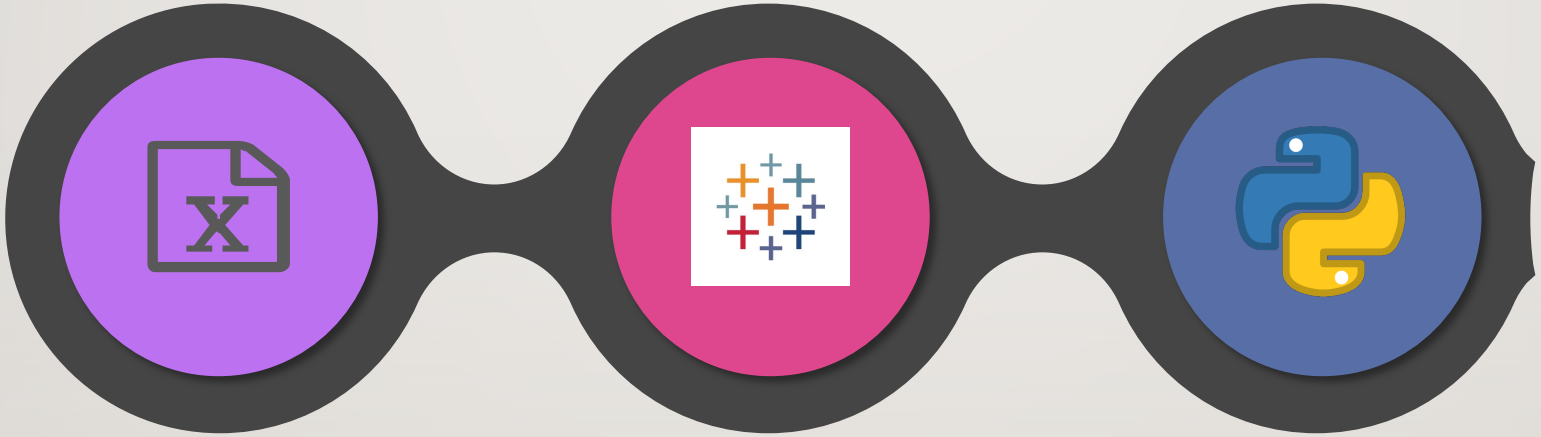
Regression Analysis

- Utilized python libraries to conduct a detailed regression analysis on the data

Spreadsheets

- Utilized spreadsheets to explore the data and create basic visualizations

TOOLS USED



Google Spreadsheets:
Exploring, aggregating and summarizing the dataset

Tableau:
Visualizing the dataset to find helpful insights

Python libraries:
- Pandas and Numpy
- Statsmodels and Scikit-learn

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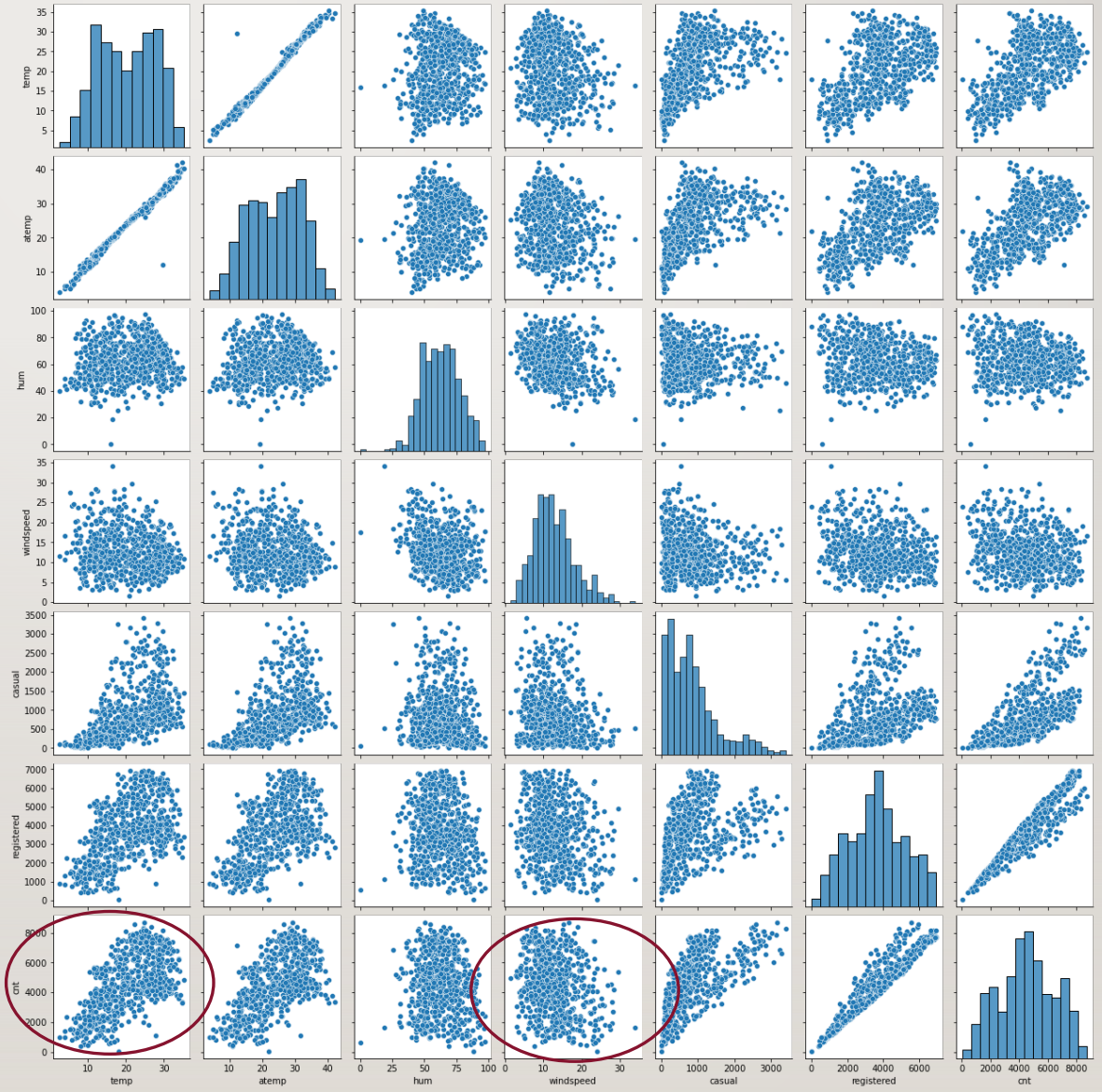
ANALYSIS -SUB AGENDA

Regression

Excel

Tableau insights & interactive dashboard

CONTINUOUS VARIABLES



Temperature vs Count of Rentals

Windspeed vs Count of Rentals

FINAL MODEL

- Equation for the best fitted line:
  - cnt = 0.143 + 0.225 x yr -0.076 x holiday + **0.523 x temp - 0.1 x windspeed** + 0.084 x season_summer + 0.125 * season_winter - 0.072 x weather_cloudy - 0.261 * weather_lightrain + 0.092 * mnth_September

- Temperature is the most important factor
- Windspeed has a negative correlation, but might not be the second important factor

ANALYSIS- SUB AGENDA

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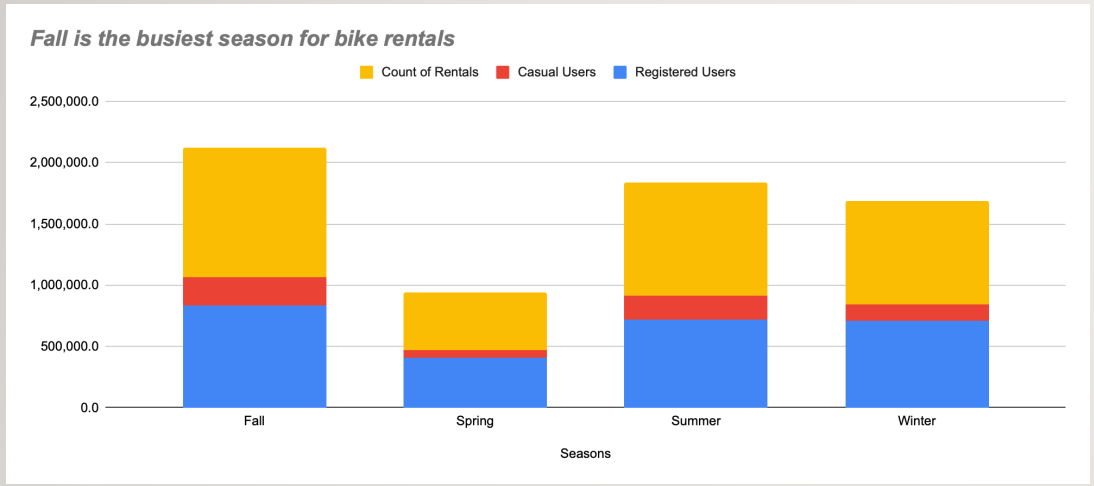
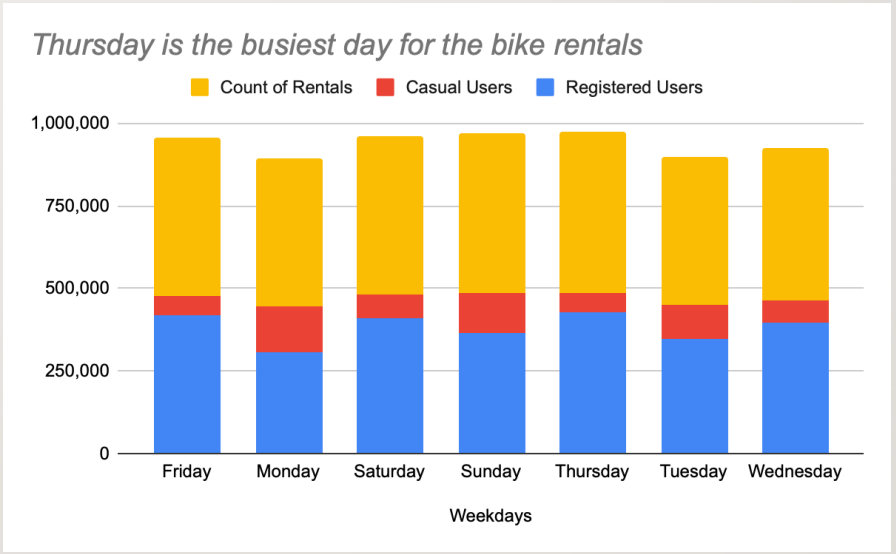
PIVOT TABLES

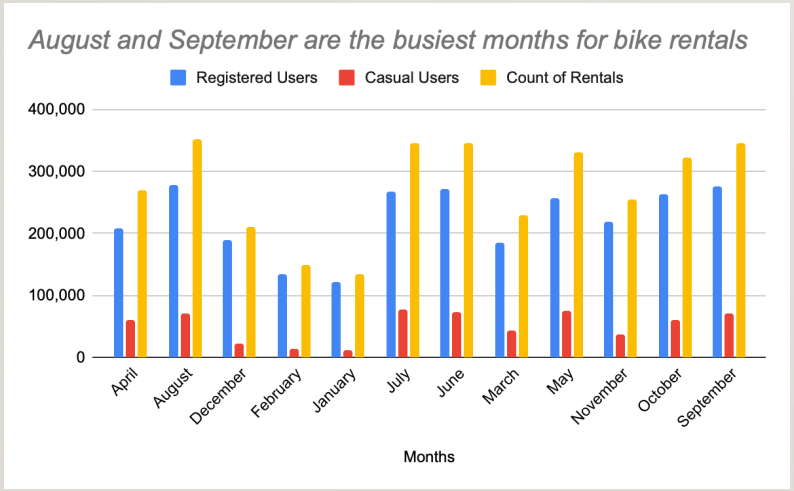
Seasons	SUM of Registered Users	SUM of Casual Users	SUM of Count of Rentals
Fall	835,038.0	226,091.0	1,061,129.0
Spring	408,957.0	60,557.0	469,514.0
Summer	715,067.0	203,522.0	918,589.0
Winter	711,831.0	129,782.0	841,613.0
Grand Total	**2,670,893.0**	**619,952.0**	**3,290,845.0**

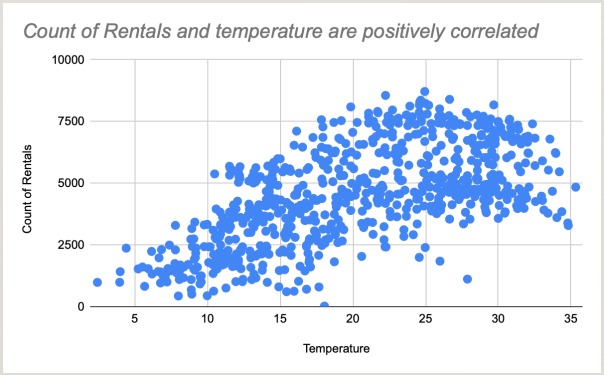
Months	SUM of Registered Users	SUM of Casual Users	SUM of Count of Rentals
April	208,292	60,802	269,094
August	279,155	72,039	351,194
December	189,343	21,693	211,036
February	134,620	14,898	149,518
January	122,891	12,042	134,933
July	266,791	78,157	344,948
June	272,436	73,906	346,342
March	184,476	44,444	228,920
May	256,401	75,285	331,686
November	218,228	36,603	254,831
October	262,592	59,760	322,352
September	275,668	70,323	345,991
Grand Total	**2,670,893**	**619,952**	**3,290,845**

CHARTS


Fall is the busiest season for bike rentals
Count of Rentals
Casual Users
Registered Users
2,500,000.0
2,000,000.0
1,500,000.0
1,000,000.0
500,000.0
0.0
Fall
Spring
Summer
Winter
Seasons


Thursday is the busiest day for the bike rentals
Count of Rentals
Casual Users
Registered Users
1,000,000
750,000
500,000
250,000
0
Friday
Monday
Saturday
Sunday
Thursday
Tuesday
Wednesday
Weekdays


August and September are the busiest months for bike rentals
Registered Users
Casual Users
Count of Rentals
400,000
300,000
200,000
100,000
0
April
August
December
February
January
July
June
March
May
November
October
September
Months


Count of Rentals and temperature are positively correlated
10000
7500
5000
2500
0
Count of Rentals
5
10
15
20
25
30
35
Temperature

ANALYSIS -SUB AGENDA

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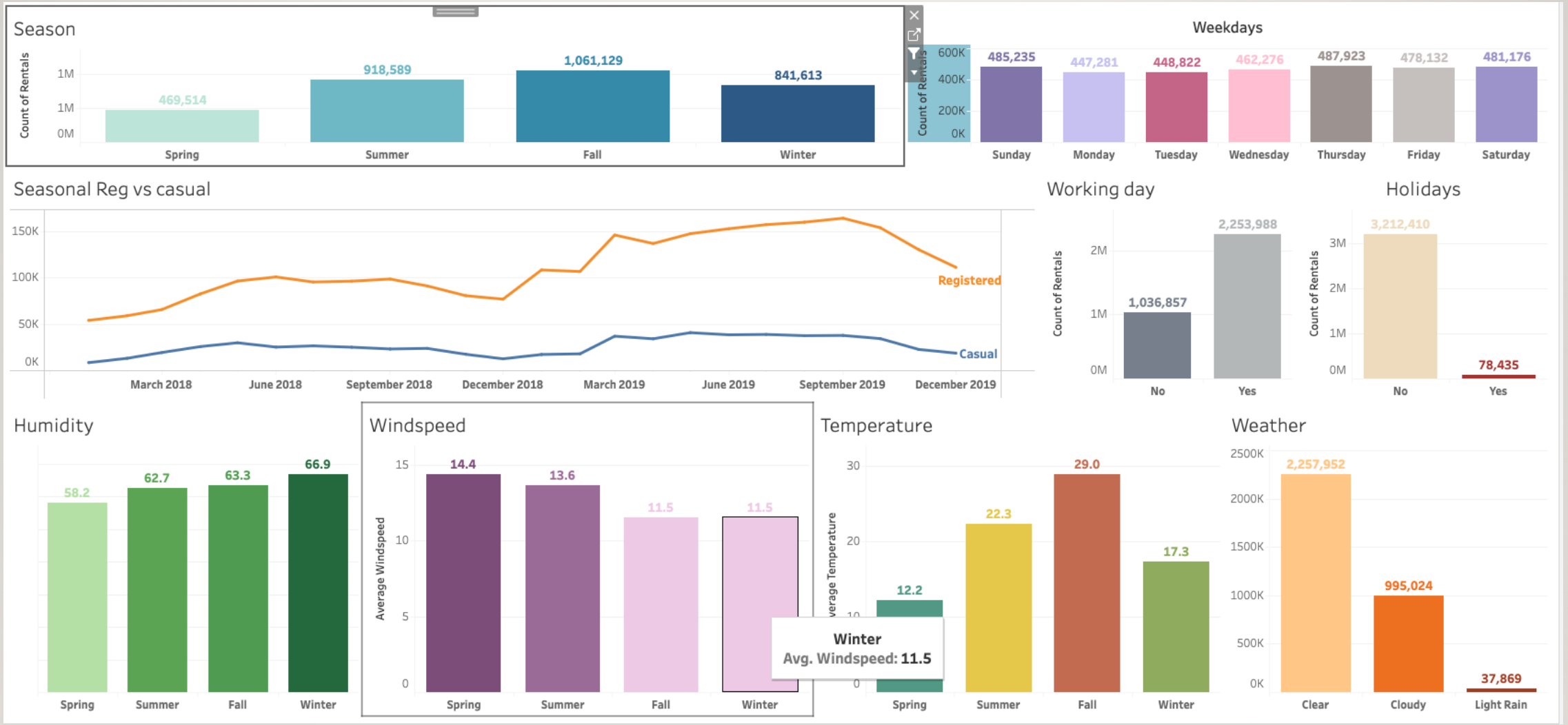
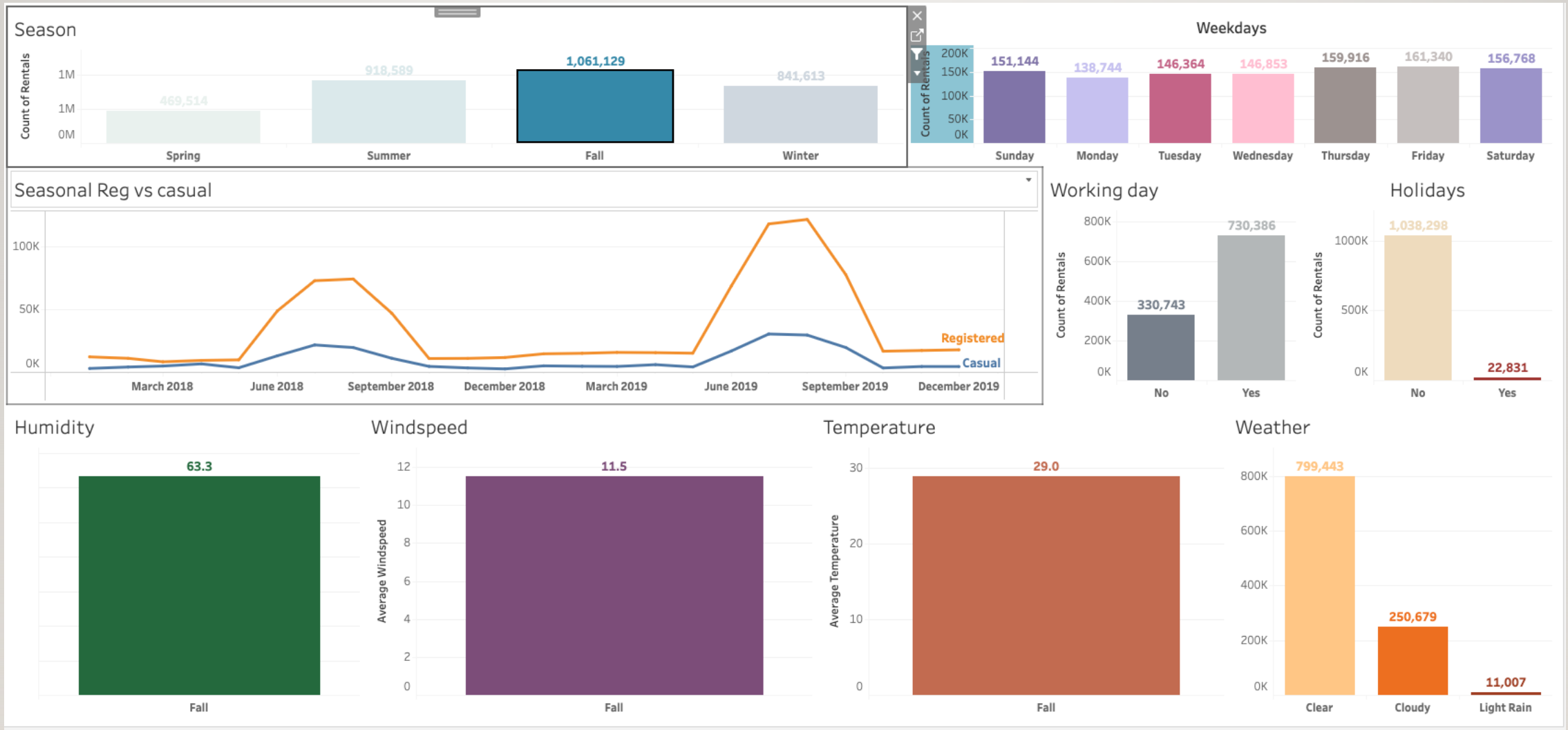
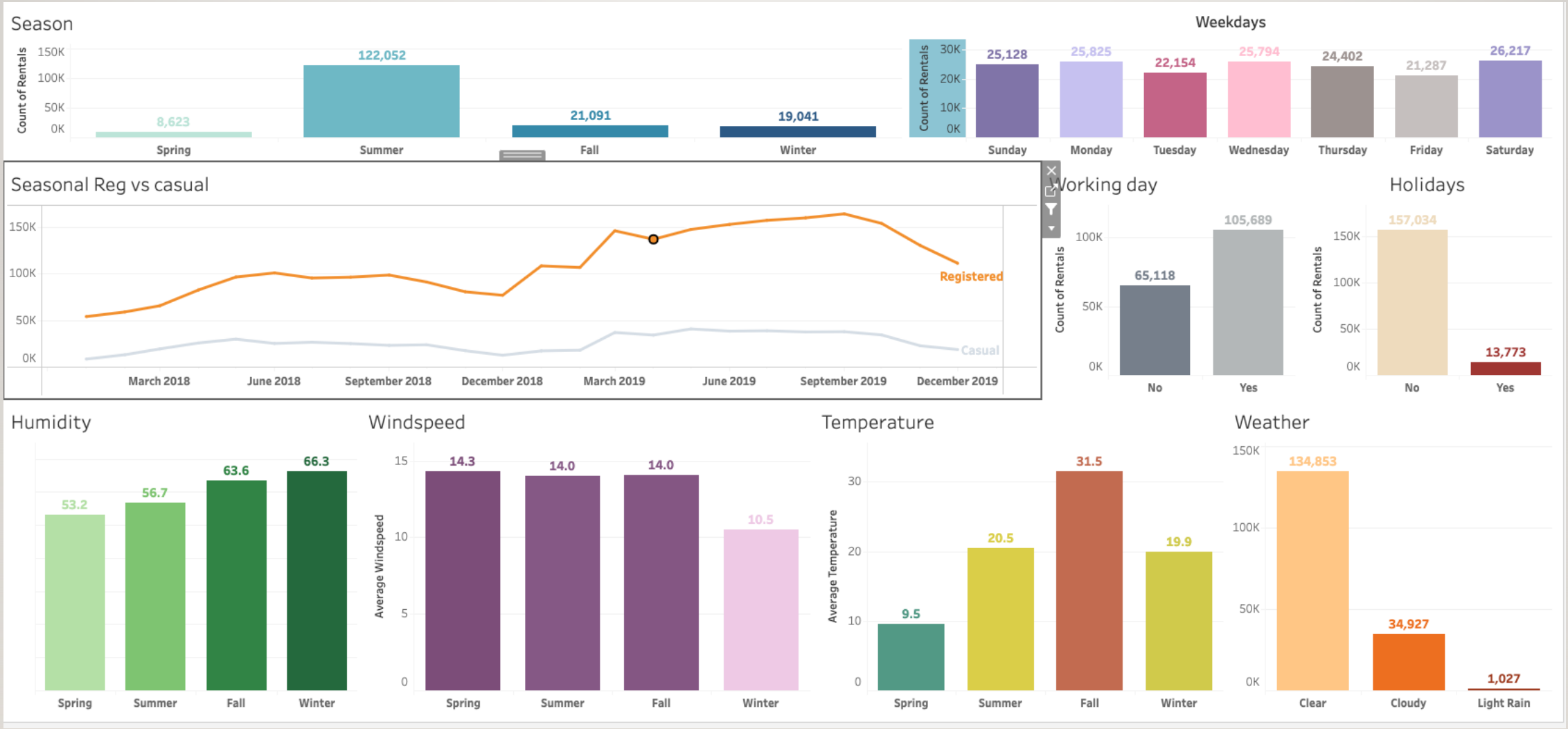
INTERACTIVE DASHBOARD



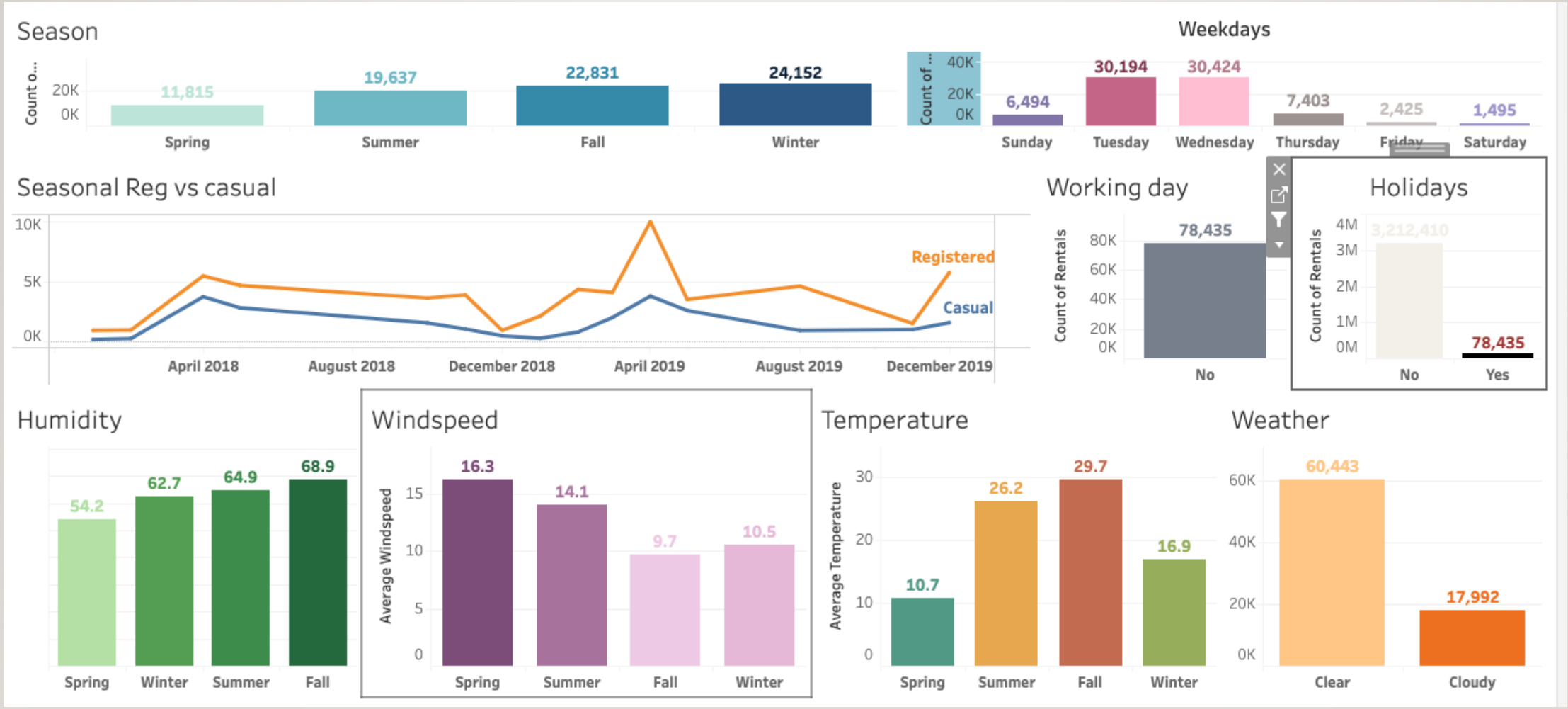
FALL SEASON IS THE BUSIEST SEASON



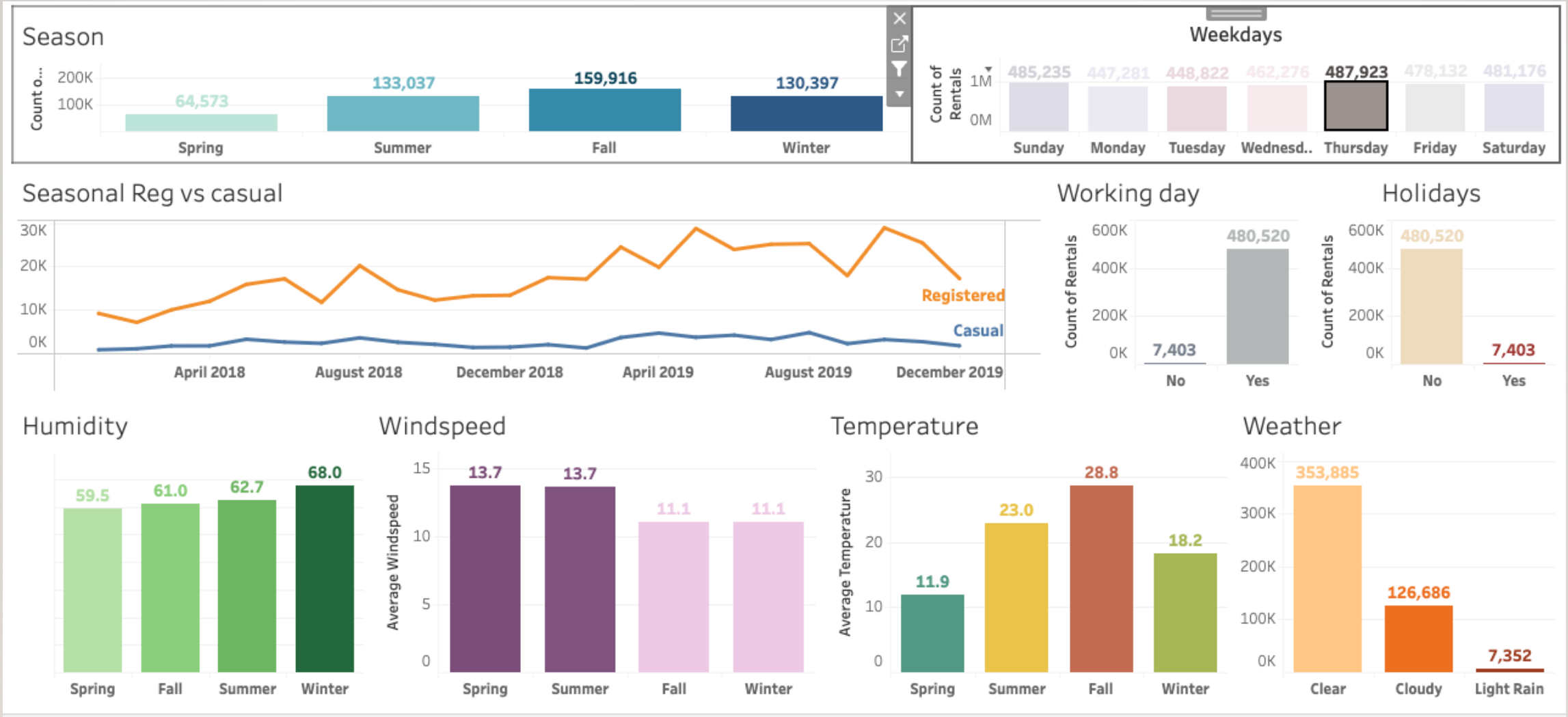
REGISTERED USERS INSIGHTS



BIKES ARE ONLY RENTED UNDER CLEAR AND CLOUDY WEATHER FOR HOLIDAYS



THURSDAY IS THE BUSIEST DAY



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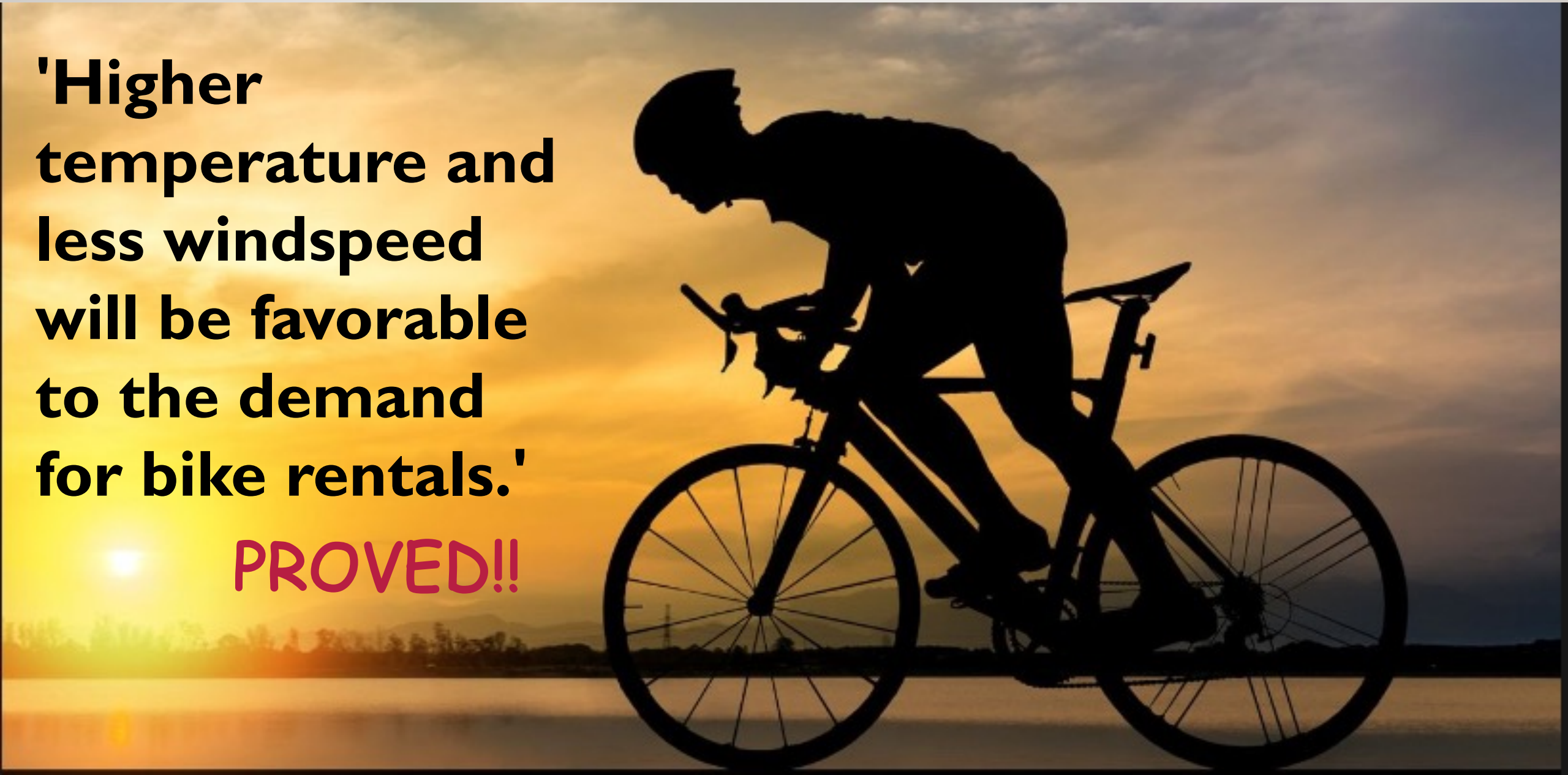
IMPACT HYPOTHESIS

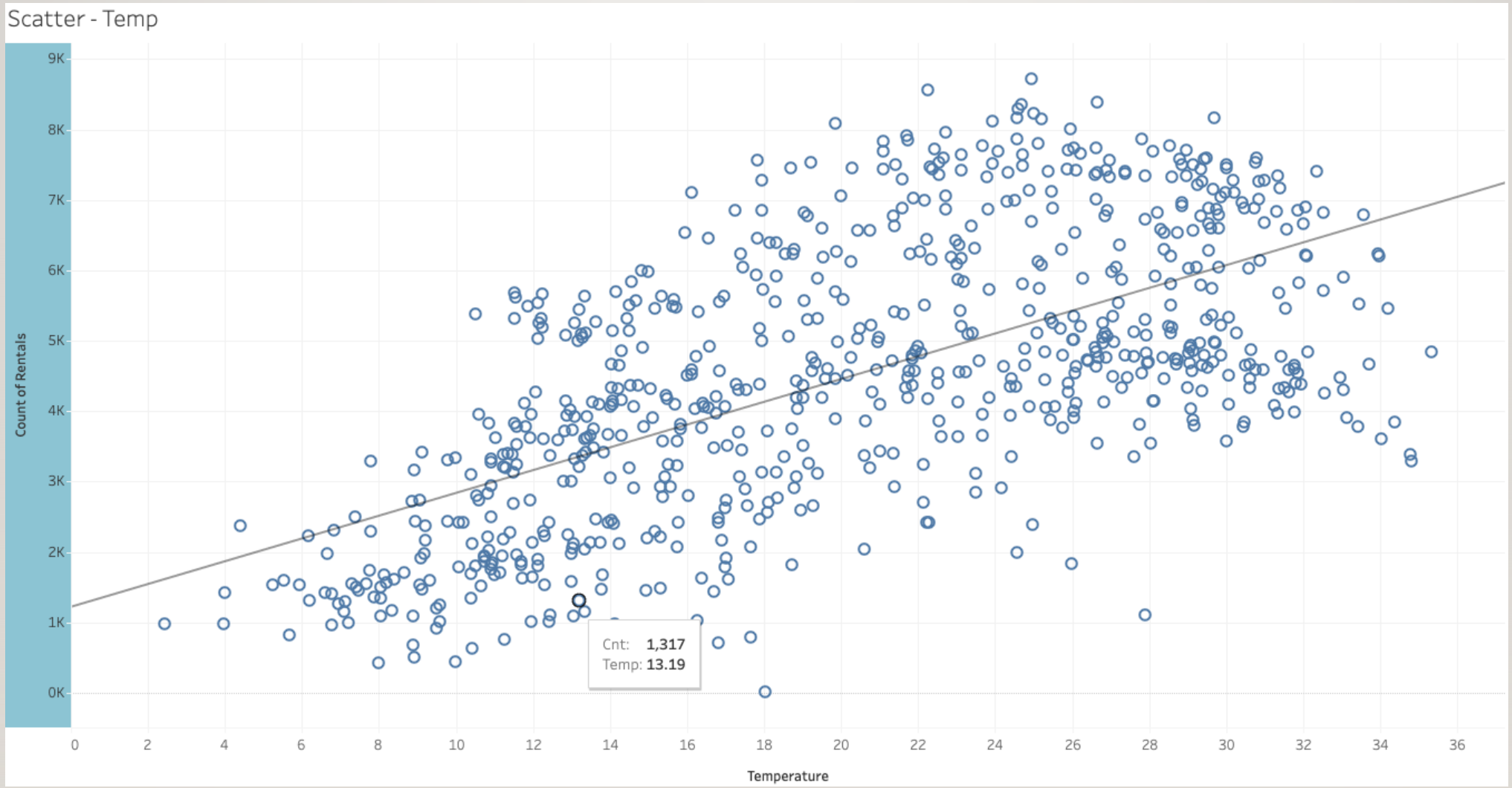


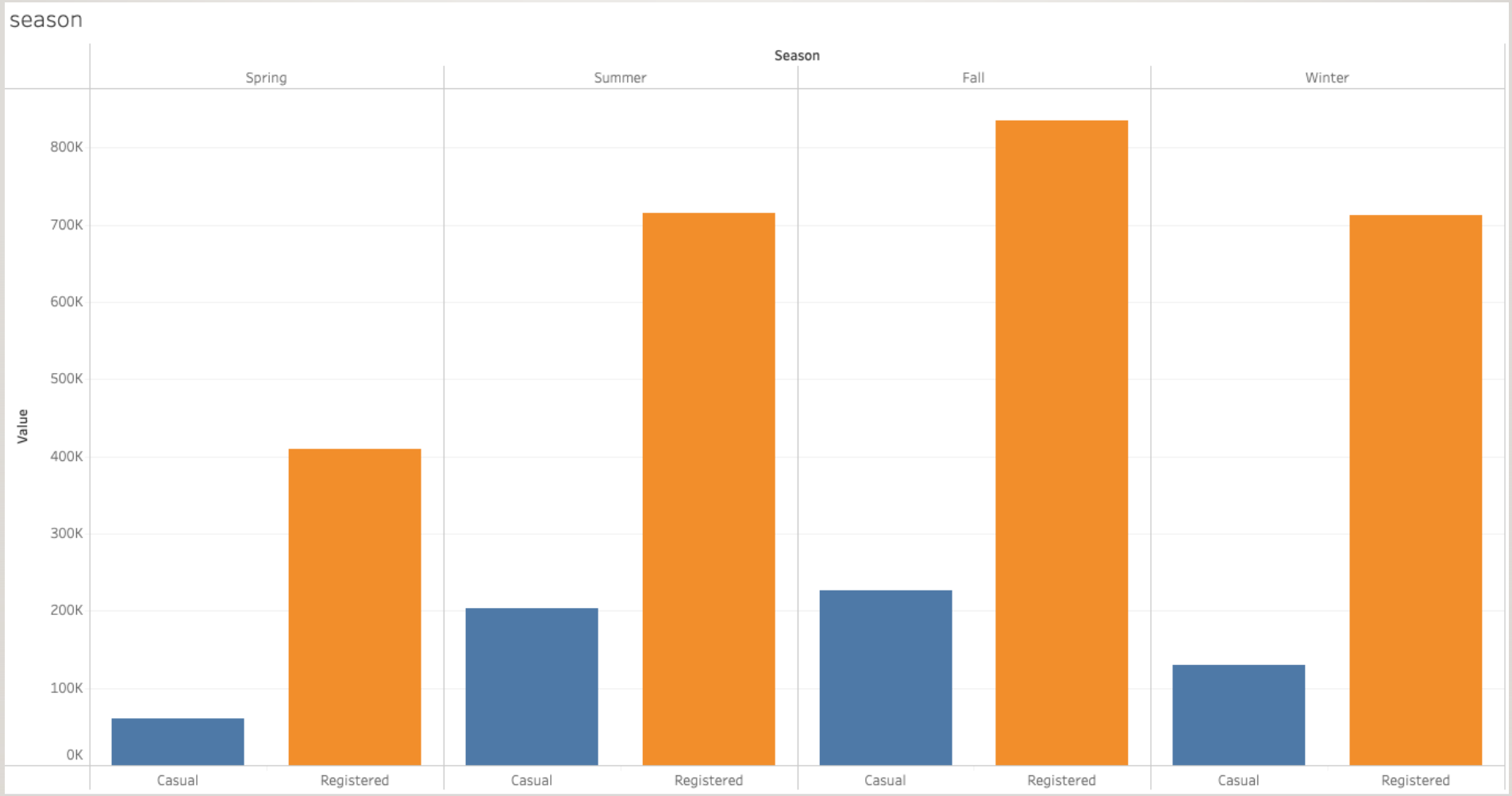
RECOMENDATIONS

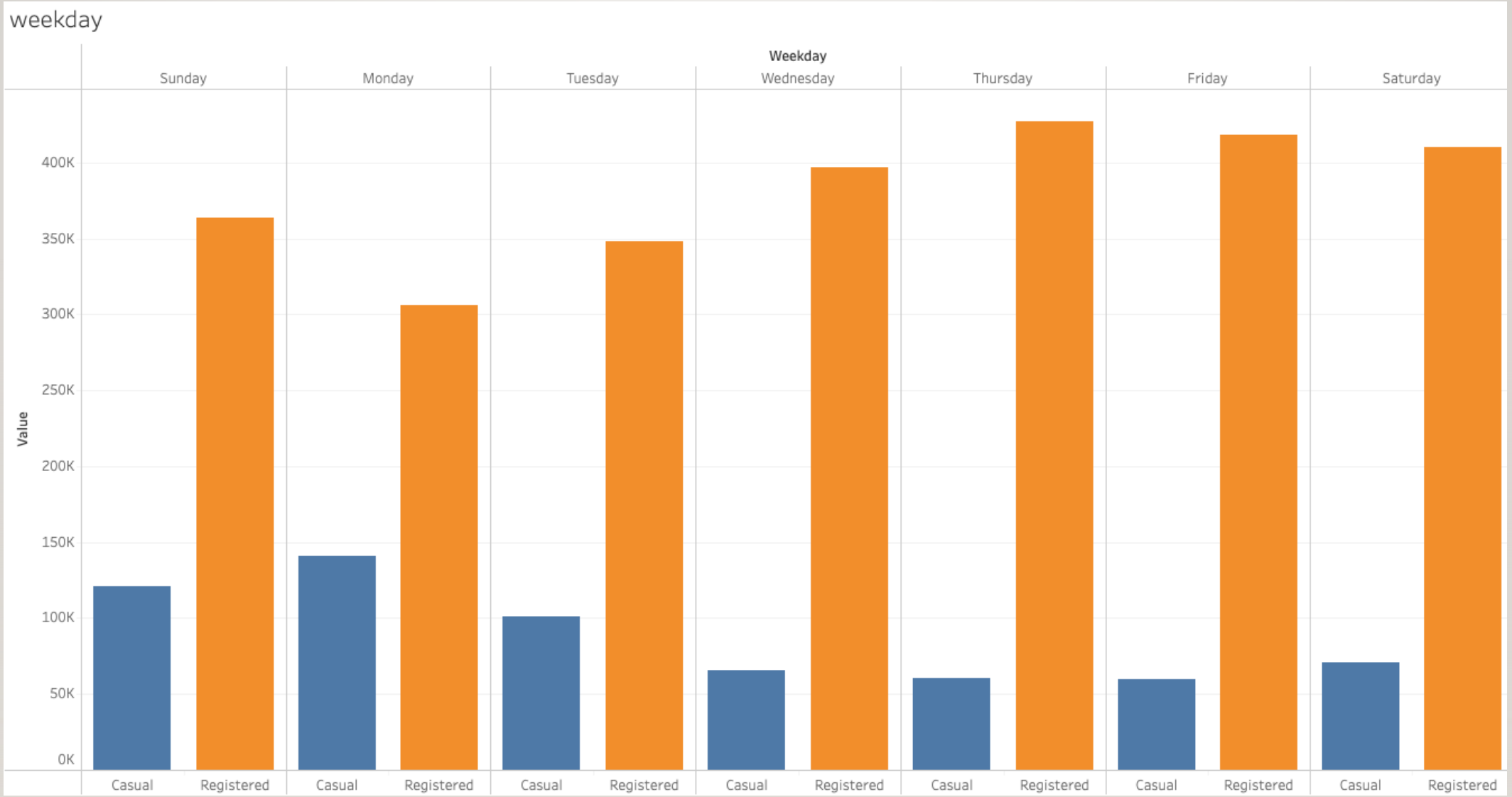
- Data insights can be used to maximize capacity utilization and optimize resource utilization
- Promotional pricing strategies for non-busy season can be devised to entice customers to rent out bikes
- Bulk maintenance can be scheduled for the spring season as least number of bikes are rented
- Registered users are responsible for the majority of the rentals. The company can offer loyalty discounts to ensure repeat customers and also drive conversion from casual users.
- Company can develop a sensor network to analyze traffic patterns, which can be marketed as an additional offering
- Company can try to access more detailed dataset that includes hourly, station locations, etc to enhance the business strategy

THANK YOU !!!

Appendix


Scatter - Temp
Count of Rentals
9K
8K
7K
6K
5K
4K
3K
2K
1K
0K
0
2
4
6
8
10
12
14
16
18
20
22
24
26
28
30
32
34
36
Temperature
Cnt: 1,317
Temp: 13.19


season
Season
Spring
Summer
Fall
Winter
Value
800K
700K
600K
500K
400K
300K
200K
100K
0K
Casual
Registered
Casual
Registered
Casual
Registered
Casual
Registered


weekday
Weekday
Sunday
Monday
Tuesday
Wednesday
Thursday
Friday
Saturday
Value
400K
350K
300K
250K
200K
150K
100K
50K
0K
Casual
Registered