**Executive Summary:**

**Investment Proposal: Targeted Promotions for Registered and Casual Users**

This proposal suggests directing the upcoming million-dollar investment towards targeted promotions for both registered and casual users of Bikes-R-Us. The objective is to boost customer acquisition, retention, and ultimately secure a larger market share in the face of intense competition.

**Current Situation:**

The bicycle-sharing market is fiercely competitive, demanding strategic investments to attract and retain customers. While expanding our branch network remains an option, the current emphasis should be on maximizing the value derived from our existing customer base.

**Proposed Approach:**

Bikes-R-Us will utilize tailored promotions to attract and retain both casual and registered users. By offering attractive incentives, Bikes-R-Us aims to convert casual users into loyal customers, while targeted promotions will encourage existing users to choose Bikes-R-Us more often, fostering deeper brand loyalty and driving sustainable revenue growth.

**Conclusion:**

* Registered users contributed significantly more than casual users (81% vs. 19%).
* Both user types saw substantial increases from 2011 to 2012 (registered: 67.91%, casual: 50.35%).
* Overall user base increased by 64% in the same period.
* Forecast for 2013 suggests a decline in casual users (7%) and slower growth in registered users (29%).
* High windspeed and humidity deter registered users.
* Registered users are most active on weekdays and weekends, with a peak in fall.
* Casual users prefer non-working days (69% usage).
* Good weather conditions lead to the highest average number of casual users.
* Regardless of user type, most prefer good weather for their journeys.

**Recommendations:**

* **Targeted Promotions**:
  + Implement different promotional strategies for registered and casual users, catering to their specific needs and motivations.
  + Offer weather-specific promotions to capitalize on seasonal trends.
* **Customer Retention & Acquisition:**
  + Develop strategies to retain existing registered users and incentivize casual users to register.

**Appendix**

**Overall description about different types of users:**

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**Summary:**

The mean ridership for casual users is **848**, while the mean ridership for registered users is **3656**. This suggests that registered users are more likely to ride than casual users. The standard deviation is higher for registered users, indicating that there is more variation in their ridership patterns. The distance between minimum and maximum values are very high indicating that there are only few large values for both the groups.

In Overall Bikes-R Us has the mean ridership of **4504** Users. By the standard deviation we can say that there is more variations in the ridership pattern.

**Description about how are our different types of users in each year :**

A table with numbers and a few letters

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**Summary:**

The statistics for the comparison between 2011 and 2012 shows that Bikes-R Us saw a great increase in both Casual and Registered users. Casual Users are increased by **50.35%** , Registered Users by **67.91%** and in overall we saw increase of users by **64.42%.** Bikes-R Us is able to attract new customers by also attracting them to register. By the standard deviation we can say that the variation is high in 2012 compared to 2011. And from maximum and minimum values we can say that few days increased the average number of users.

**Past, Present and Future:**

A pie chart with text on it

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**Summary:**

From the visualization, we can see that there is huge increase of users from 2011 to 2012 but the forecast for **2013** shows **decrease** in casual users and **minimal growth** in registered users. This indicates that investing in promotions to attract new customers and retain existing ones is a wise strategic move to stay competitive in the market.

**Description about how are our users in each month:**

A graph with green and blue lines

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**Summary:**

The above line graph shows the average number of registered and casual users of Bikes-R-Us each month. The green line represents registered users, and the blue line represents casual users. Both groups experience a significant increase in users starting in April, and this trend continues through September.

**How are different factors effecting Registered users?**

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**Linear Regression Equation :**

y(RegisteredUsers)=818.06-10.90(Humidity)- 31.85(Windspeed)+70.51(Temp\_c)+370.83(Weather)+960.90(WorkingDay)+1750.83(Year)+386.41(Season)+39.51(Day)

**Hypothesis Testing :**

**Step 1:**

H0= β1= β2= β3= β4= β5= β6= β7= β8=0

H1= Atleast one βi should be different

**Step 2:**

α=0.05

**Step 3:**

F=369.64

**Step 4:**

P= <0.0001 < 0.05

**Step 5:**

Reject H0

**Step 6:**

There is a significant linear relationship between Registered users and Humidity, Temperature, Windspeed, Weather, year, season, day and working day

Adj r2 =0.80

**Summary:**

**80 %** of the variability in registered users can be explained with the linear relationship between registered users and all the variables.

The above analysis employed linear regression to assess the relationship between registered bike users and various variables, including temperature, humidity, and wind speed. The analysis reveals that wind speed and humidity are negatively correlated with registered user count. This indicates that an increase in either wind speed or humidity is associated with a decrease in registered users utilizing our bikes. Additionally, analysis shows that registered users are more likely to use our services during working days.

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A table with numbers and letters

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**Summary:**

While the above analysis identified significant linear relationships between registered users and several factors, including temperature, humidity, wind speed, weather, year, season, day of the week, and working day, two additional variables – **month and holiday** – were found to be statistically **non-significant**. However, a closer examination reveals that month and holiday still exert some influence on registered user behavior. I observed that registered users are less likely to utilize our services during holidays and that the number of registered users varies across different months, suggesting the presence of seasonal trends.

**How are different factors effecting casual users?**

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**Linear regression Equation:**

y(CasualUsers)=963.04-4.66(Humidity)-15.02(Windspeed)+43.70(Temp\_c)+95.29(Weather)-830.09(WorkingDay)+285.80(Year)+24.91(Day)-285.08(Holiday)

**Hypothesis Testing :**

**Step 1:**

H0= β1= β2= β3= β4= β5= β6= β7= β8=0

H1= Atleast one βi should be different

**Step 2:**

α=0.05

**Step 3:**

F=194.08

**Step 4:**

P= <0.0001 < 0.05

**Step 5:**

Reject H0

**Step 6:**

There is a significant linear relationship between Casual users and Humidity, Temperature, Windspeed, Weather, year, season, day and working day

**Summary:**

**67%** variability in casual users can be explained by the linear relationship between casual users and all the variables in the test.

This analysis utilizes linear regression to explore the relationship between casual bike users and various factors, including year, temperature, weather, and others, as depicted in the accompanying analysis output. Notably, the analysis reveals that both holidays and working days hold a negative association with casual user count.

**Can we offer similar promotions to casual users for working days with different weather conditions ?**

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The analysis presented above utilizes a factorial ANOVA test to investigate the potential presence of interaction effects between weather conditions and working days on Casual Users

**Hypothesis testing :**

**Step 1:**

H0: No interaction effect

H1: Has interaction

**Step 2:**

α = 0.05

**Step 3:**

F=1.19

**Step 4:**

P=0.2751 > 0.05

**Step 5:**

Fail to reject null

**Step 6:**

No statistically significant interaction effect was observed between working day and weather for Casual users.

We can apply different promotions to different weather conditions and different promotions to working days, weekends.

**Analysis of how Weather impacts on Casual users:**

A green and black numbers

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**Hypothesis Testing:**

**Step 1:**

H0: µ (Good Weather) = µ(Bad Weather)

H1: µ (Good Casual Users)!= µ (Bad Weather)

**Step 2:**

α = 0.05

**Step 3:**

F=37.45

**Step 4:**

P=<0.0001 < 0.05

**Step 5:**

reject null hypothesis

**Step 6:**

The average number of casual riders on days with favorable weather conditions is Significantly different from the average number of casual riders on days with unfavorable weather conditions.

**Summary:**

Based on the above analysis and hypothesis testing, we can conclude that casual riders more likely to utilize our services when favorable weather conditions prevail. This suggests that weather plays a significant role in influencing the ridership behavior of casual users.

**Analysis of how Working day impacts casual users:**

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**Hypothesis Testing:**

**Step 1:**

H0: µ (Not a working day) = µ(Working day)

H1: µ (Not a working day)!= µ (Working day)

**Step 2:**

α = 0.05

**Step 3:**

F=231.12

**Step 4:**

P=<0.0001 < 0.05

**Step 5:**

reject null hypothesis

**Step 6:**

There is a substantial difference in average casual ridership between working and non-working days.

**Summary:**

Based on the above analysis and hypothesis testing, we can conclude that casual riders exhibit a marked preference for utilizing our services on non-working days. This suggests that leisure time significantly influences ridership behavior among this user group.

**Can we offer same promotions to registered users during working days for all the weather conditions?**

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The analysis presented above utilizes a factorial ANOVA test to investigate the potential presence of interaction effects between weather conditions and working days on Registered Users

**Hypothesis Testing:**

**Step 1:**

H0: No interaction effect

H1: Has interaction

**Step 2:**

α = 0.05

**Step 3:**

F=3.48

**Step 4:**

P=0.0627 > 0.05

**Step 5:**

Fail to reject null

**Step 6:**

No statistically significant interaction effect was observed between working day and weather for registered users. We can offer different promotions for working days and different promotions to weather conditions.

**Analysis of how weather impacts registered users:**

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**Hypothesis Testing:**

**Step 1:**

H0: µ (Good Weather) = µ(Bad Weather)

H1: µ (Good Casual Users)!= µ (Bad Weather)

**Step 2:**

α = 0.05

**Step 3:**

F=30.75

**Step 4:**

P=<0.0001 < 0.05

**Step 5:**

reject null hypothesis

**Step 6:**

The average number of Registered riders on days with favorable weather conditions is Significantly different from the average number of casual riders on days with unfavorable weather conditions.

**Summary :**

Based on the above analysis and hypothesis testing, we can conclude that registered riders demonstrate a significant preference for utilizing bike-sharing services when weather conditions are favorable. This suggests that weather plays a key role in influencing the ridership behavior of registered users. And promotions can be applied to increase the ridership in good weather conditions because even though we offer great promotions during bad weather that may not impact the sales.

**Analysis of how working day impacts registered users:**

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**Hypothesis Testing:**

**Step 1:**

H0: µ (Not a working day) = µ(Working day)

H1: µ (Not a working day)!= µ (Working day)

**Step 2:**

α = 0.05

**Step 3:**

F=67.76

**Step 4:**

P=<0.0001 < 0.05

Step 5:

reject null hypothesis

**Step 6:**

There is a substantial difference in average Registered ridership between working and non-working days.

**Summary:**

Based on the above analysis and hypothesis testing, we can conclude that registered riders exhibit a marked preference for utilizing our services on working days. This suggests that factors related to work or schedules play a significant role in influencing registered riders. So we need to run promotional campaigns accordingly to increase riders in weekends and to maintain users in working days.

**Can We offer similar promotions for casual users in different seasons and weather?**

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**A screenshot of a graph

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The above analysis shows how season and weather has impact on casual users

**Hypothesis Testing:**

**Step 1:**

H0: No interaction effect

H1: Has interaction

**Step 2:**

α = 0.05

**Step 3:**

F=4.52

**Step 4:**

P=0.0038 < 0.05

**Step 5:**

reject null

**Step 6:**

There is statistically significant interaction effect was observed between season and weather for casual users.

**Summary:**

From the above analysis and hypothesis testing we can say that the weather condition and season has a combination effect on casual users. We can offer similar promotions for different seasons and good weather conditions and similar promotions for different seasons and bad health conditions. From the tukey’s test on an average casual users are more likely to use our services in summer and if there is good weather and least in spring and if there is bad weather.

**Can We offer similar promotions for registered users in different seasons and weather?**

A screenshot of a graph

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**Hypothesis Testing:**

**Step 1:**

H0: No interaction effect

H1: Has interaction

**Step 2:**

α = 0.05

**Step 3:**

F=1.78

**Step 4:**

P=0.1499 > 0.05

**Step 5:**

Fail to reject null

**Step 6:**

There is no statistically significant interaction effect was observed between season and weather for registered users.

We can offer different promotions for different weather and different promotions for different seasons

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**Hypothesis Testing:**

**Step 1:**

H0: µ (Summer) = µ(Fall)= µ(Spring)= µ(Winter)

H1: Not all means are equal

**Step 2:**

α = 0.05

**Step 3:**

F=84.37

**Step 4:**

P=<0.0001 < 0.05

Step 5:

reject null hypothesis

**Step 6:**

There is a substantial difference in average Registered ridership between Seasons.

**Summary:**

From the tukey’s test we can say that in the fall season registered customers are using our services more compared to any other season with the average users of **4278** which contributed **30%** users of all the seasons and least in spring season with the average users **2220** which contributed **15.5%** users of all the seasons. We can give promotions for different seasons based on users. We can run good promotional campaign in spring season where we are having less users and a normal promotional campaign in fall because we should not loose our customers and even for the remaining seasons we could use different promotional strategies.

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**Hypothesis Testing:**

**Step 1:**

H0: µ (Good) = µ(Bad)

H1: µ (Good)! = µ(Bad)

**Step 2:**

α = 0.05

**Step 3:**

F=39.27

**Step 4:**

P=<0.0001 < 0.05

Step 5:

reject null hypothesis

**Step 6:**

There is a substantial difference in average Registered ridership between Seasons.

**Summary:**

From the tukey’s test we can say that in the good weather registered customers are using our services more compared to users in bad weather with the average users of **3874** which contributed **54%** users of all the users. And users using our services in bad weather are remaining **46%.** We can offer different kind of promotions for the users in good and bad weather.

**Key Findings:**

* **Differing User Behavior:**
  + Registered users are more active on working days, suggesting potential needs for work-related commutes.
  + Casual users are more active on weekends, highlighting preference for leisure riding.
* **Declining Casual Users**:
  + The analysis reveals that there might be a decrease in casual users in 2013, requiring targeted strategies to attract and retain them.
* **Predominant Registered Users:**
  + A majority of the customer base comprises registered users, indicating focus on enhancing their experience.
* **Seasonal Trends**:
  + User activity significantly increases during April-September, likely due to favorable weather conditions.
  + Weather plays a crucial role in user behavior, irrespective of user type.