Case Studys

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Ask Phase

To analyze how annual members different from Causal Riders that use Cyclistic Bikes. How does casual riders use their bikes compare to annual members.So we can create a marketing strategy for casual members to convert to annual members.

Prepare Phase

The data was download from Divy Bikes Website. https://ride.divvybikes.com/system-data The data is organized in Quartely CVS Zip Files. The data is orginial since its from their own company dataset. I use Google Sheets to open the dataset, when I opened I saw their are some missing entries for gender and birthyear. This personal information isn't necessary for purchasing bikes so some people don't write it down When I clean my data I will use R program because there are about 3.8 millon entries it will be easier to use R because it will be able to handle large datasets

Process Phase

##Install Required Packages and load Them #Install Require Packages #Tidyverse for data importing #lubridate for data function #ggplot for visualization

```
library(tidyverse)
library(lubridate)
library(ggplot2)
```

Collect Data

#Upload Divy Datasets(cvs file here)

```
q2_2019 <- read_csv("Divvy_Trips_2019_Q2.csv")
q3_2019 <- read_csv("Divvy_Trips_2019_Q3.csv")
q4_2019 <- read_csv("Divvy_Trips_2019_Q4.csv")
q1_2020 <- read_csv("Divvy_Trips_2020_Q1.csv")
```

Combine Data into Single File

##Rename the column names so they are consistent with q1_2020

```
(q4_2019 <- rename(q4_2019,
                  ride_id = trip_id,
                  rideable_type = bikeid,
```

```
                   started_at = start_time,
                   ended_at = end_time,
                   start_station_name = from_station_name,
                   start_station_id = from_station_id,
                   end_station_name = to_station_name,
                   end_station_id = to_station_id,
                   member_casual = usertype))

(q3_2019 <- rename(q3_2019,
                   ride_id = trip_id,
                   rideable_type = bikeid,
                   started_at = start_time,
                   ended_at = end_time,
                   start_station_name = from_station_name,
                   start_station_id = from_station_id,
                   end_station_name = to_station_name,
                   end_station_id = to_station_id,
                   member_casual = usertype))

(q2_2019 <- rename(q2_2019
                   ,ride_id = "01 - Rental Details Rental ID"
                   ,rideable_type = "01 - Rental Details Bike ID"
                   ,started_at = "01 - Rental Details Local Start Time"
                   ,ended_at = "01 - Rental Details Local End Time"
                   ,start_station_name = "03 - Rental Start Station Name"
                   ,start_station_id = "03 - Rental Start Station ID"
                   ,end_station_name = "02 - Rental End Station Name"
                   ,end_station_id = "02 - Rental End Station ID"
                   ,member_casual = "User Type"))

# convert variable to character type
q4_2019 <- mutate(q4_2019, ride_id = as.character(ride_id)
                  ,rideable_type = as.character(rideable_type))
q3_2019 <-mutate(q3_2019, ride_id = as.character(ride_id)
                 ,rideable_type = as.character(rideable_type))
q2_2019 <- mutate(q2_2019, ride_id = as.character(ride_id)
                  ,rideable_type = as.character(rideable_type))
#Stack the inviduals qurater data fame into a single big data frame
all_trips <- bind_rows(q2_2019,q3_2019,q4_2019,q1_2020)

#remove fields of data
all_trips <- all_trips %>%
  select(-c(start_lat,start_lng,end_lat,birthyear,gender,
            "01 - Rental Details Duration In Seconds Uncapped",
            "05 - Member Details Member Birthday Year","Member Gender",
            "tripduration"))
```

##Clean Up And Add Data

```r
#Reassign the desire values that will go with current 2020 labels
all_trips <- all_trips %>%
  mutate(member_casual = recode(member_casual
                                ,"Subscriber" = "member"
                                , "Customer" = "casual"))

#Add colums to list the Date,month,day, and year of each ride
all_trips$date <- as.Date(all_trips$started_at)
all_trips$month <- format(as.Date(all_trips$date),"%m")
all_trips$day <- format(as.Date(all_trips$date),"%d")
all_trips$year <- format(as.Date(all_trips$date),"%y")
all_trips$day_of_week <- format(as.Date(all_trips$date),"%A")

#Add a ride length caluclation to calculate the trip length in second
all_trips$ride_length <- difftime(all_trips$ended_at,all_trips$started_at)

#Convert ride length from factor to numeric so we can perform caluclations
is.factor(all_trips$ride_length)
```

```
## [1] FALSE
```

```r
all_trips$ride_length <- as.numeric(as.character(all_trips$ride_length))
is.numeric(all_trips$ride_length)
```

```
## [1] TRUE
```

```r
#We will create a new datafram(v2) since data is being removed
all_trips_v2 <- all_trips[!(all_trips$start_station_name == "HQ QR" |
                              all_trips$ride_length<0),]
```

##Analyze Phase ##Descriptive Analysis

```r
#Summary or ride lenth(in seconds)
summary(all_trips_v2$ride_length)
```

```
##    Min. 1st Qu.  Median    Mean 3rd Qu.    Max.
##       1     412     712    1479    1289 9387024
```

```r
#Compare members and casual users
aggregate(all_trips_v2$ride_length~ all_trips_v2$member_casual, FUN = mean)
```

```
##   all_trips_v2$member_casual all_trips_v2$ride_length
## 1                     casual                3552.7502
## 2                     member                 850.0662
```

```r
aggregate(all_trips_v2$ride_length~ all_trips_v2$member_casual, FUN = median)
```

```
##   all_trips_v2$member_casual all_trips_v2$ride_length
## 1                     casual                      1546
## 2                     member                       589
```

```
aggregate(all_trips_v2$ride_length~ all_trips_v2$member_casual, FUN = max)
```

```
##   all_trips_v2$member_casual all_trips_v2$ride_length
## 1                     casual                  9387024
## 2                     member                  9056634
```

```
aggregate(all_trips_v2$ride_length~ all_trips_v2$member_casual, FUN = min)
```

```
##   all_trips_v2$member_casual all_trips_v2$ride_length
## 1                     casual                        2
## 2                     member                        1
```

```
#See the averate time by each day for members vs casual users
aggregate(all_trips_v2$ride_length ~ all_trips_v2$day_of_week,FUN = mean)
```

```
##   all_trips_v2$day_of_week all_trips_v2$ride_length
## 1                   Friday                 1452.156
## 2                   Monday                 1296.635
## 3                 Saturday                 1964.200
## 4                   Sunday                 1993.965
## 5                 Thursday                 1324.161
## 6                  Tuesday                 1244.759
## 7                Wednesday                 1275.481
```

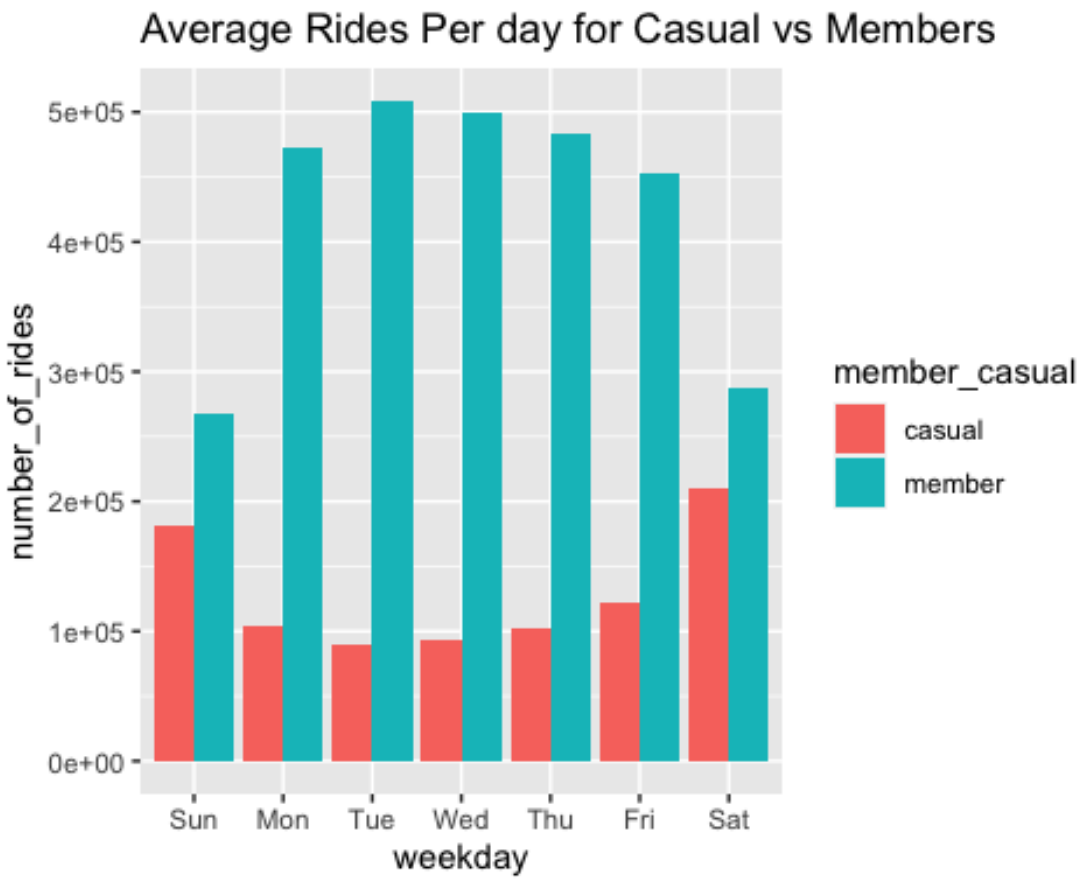
```
#Fixing the days out of order
all_trips_v2$day_of_week <-
ordered(all_trips_v2$day_of_week,levels=c("Sunday",
"Monday","Tuesday","Wednesday","Thursday","Friday","Saturday"))

#Run the average time by each day member vs casual users
aggregate(all_trips_v2$ride_length ~ all_trips_v2$member_casual +
            all_trips_v2$day_of_week,FUN = mean)
```

```
##    all_trips_v2$member_casual all_trips_v2$day_of_week
all_trips_v2$ride_length
## 1                      casual                   Sunday
3581.4054
## 2                      member                   Sunday
919.9746
## 3                      casual                   Monday
3372.2869
## 4                      member                   Monday
842.5726
## 5                      casual                  Tuesday
3596.3599
## 6                      member                  Tuesday
826.1427
## 7                      casual                Wednesday
3718.6619
```

```
## 8                        member                 Wednesday
823.9996
## 9                        casual                  Thursday
3682.9847
## 10                       member                  Thursday
823.9278
## 11                       casual                    Friday
3773.8351
## 12                       member                    Friday
824.5305
## 13                       casual                  Saturday
3331.9138
## 14                       member                  Saturday
968.9337
```

```
#Show the number riders per day
all_trips_v2 %>%
  mutate(weekday = wday(started_at,label= TRUE)) %>%
  group_by(member_casual,weekday)%>%
  summarise(number_of_rides = n(),
            average_duration = mean(ride_length))%>%
  arrange(member_casual,weekday)%>%
  ggplot(aes(x=weekday,y=number_of_rides,fill=member_casual))+
  geom_col(position="dodge")+
  labs(title = "Average Rides Per day for Casual vs Members")
```

```
## `summarise()` has grouped output by 'member_casual'. You can override
using the
## `.groups` argument.
```

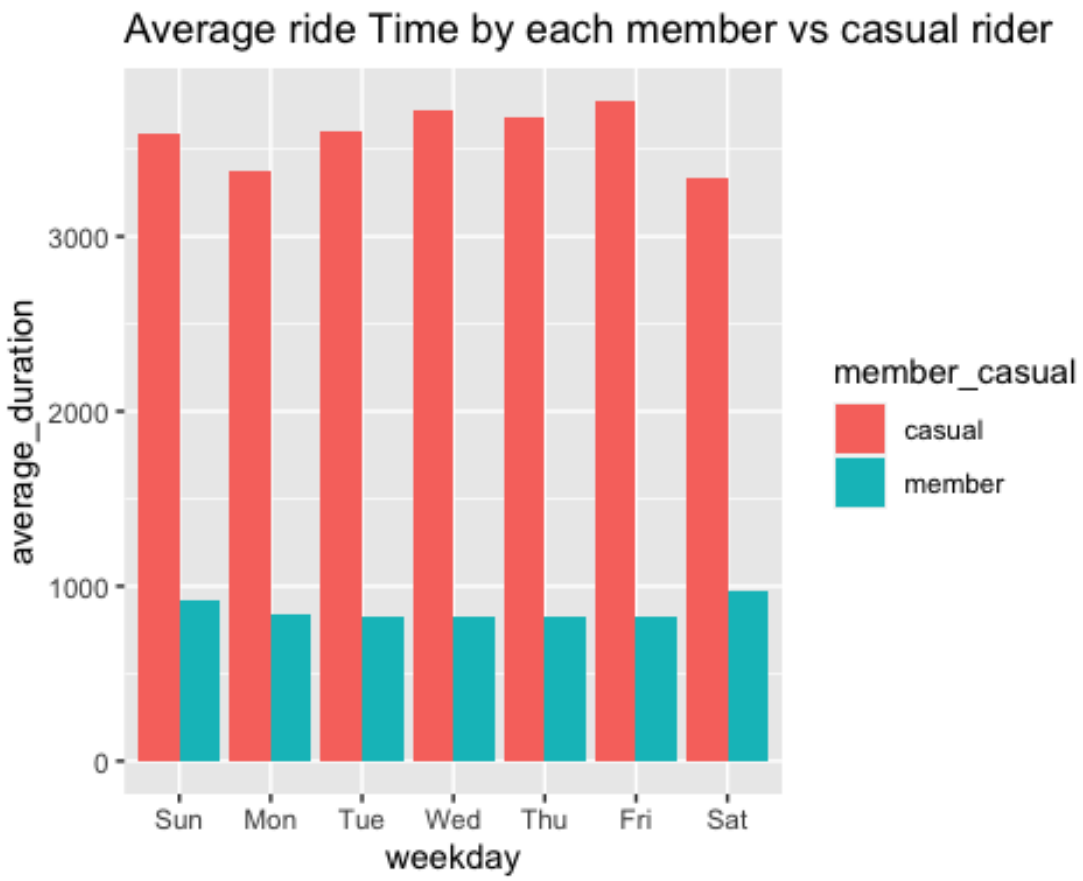


#Share

Phase

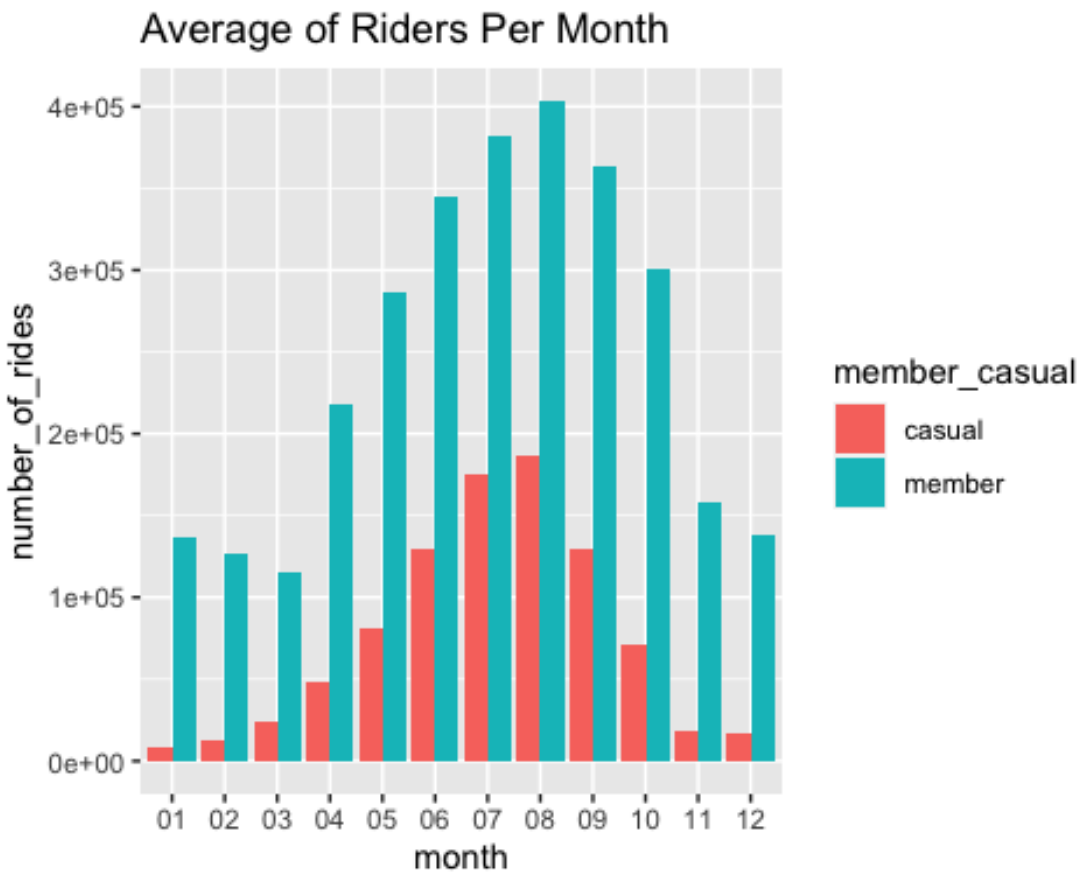
```
all_trips_v2 %>%
  mutate(weekday = wday(started_at,label= TRUE)) %>%
  group_by(member_casual,weekday)%>%
  summarise(number_of_rides = n(),
            average_duration = mean(ride_length))%>%
  arrange(member_casual,weekday)%>%
  ggplot(aes(x=weekday,y=average_duration,fill=member_casual))+
  geom_col(position="dodge")+
  labs(title = "Average ride Time by each member vs casual rider")
```

```
## `summarise()` has grouped output by 'member_casual'. You can override
using the
## `.groups` argument.
```




```
all_trips_v2 %>%
  mutate(weekday = month(started_at,label= TRUE)) %>%
  group_by(member_casual,month)%>%
  summarise(number_of_rides = n(),
            average_duration = mean(ride_length))%>%
  arrange(member_casual,month)%>%
  ggplot(aes(x=month,y=number_of_rides,fill=member_casual))+
  geom_col(position="dodge")+
  labs(title = "Average of Riders Per Month")
```

```
## `summarise()` has grouped output by 'member_casual'. You can override
using the
## `.groups` argument.
```



Conclusion

My conclusion from my analysis of Cyclistic Bikes is that members ride more often, usually to work or to buy something without any cars or transportation. They ride short distances compared to casual riders who ride long distances for a hike or out with family and want to ride out and have fun.Casual riders only ride bikes mostly on the weekend because it is usually when they don't have work or school and can have fun. Members need the bike for transportation.

Some next steps that I would take with my stakeholders based on my findings is find a way for making the membership cheaper so people would buy the membership. We would collaborate to find the best solution to increase benefits to the membership that correlates for casual riders that fit their needs.

My top three Recommendations

- Reduce Membership Cost
- Increase Benefits for the membership Change
- How you charge, for example the distance, so people will get the membership just to be able to bike farther.