slide_deck_template

April 20, 2021

1 2019.02 Ford Go Bike - trip data

1.1 by Szymon Debski

1.2 Investigation Overview

The exploration and visualization purpose is to find a pattern in bike riding history, mainly focusing on ride duration and characteristics of people riding the bike.

1.3 Dataset Overview

The data set is the Ford Go Bike trip data. The data was collected in February 2019 in San Francisco Bay Area. The data set I will be using has over 18 hundred records and information such as (trip duration, sex, user type, date of birth). All the analysis presented below is based on this data after it has been wrangled.

[19]:
```
# import all packages and set plots to be embedded inline
import numpy as np
import pandas as pd
import matplotlib.pyplot as plt
import seaborn as sb

%matplotlib inline

# suppress warnings from final output
import warnings
warnings.simplefilter("ignore")
```

[20]:
```
df = pd.read_csv('df_clean.csv')
df.head()
```

[20]:
```
   duration_sec              start_time                 end_time  bike_id  \
0          1585  2019-02-28 23:54:18.549  2019-03-01 00:20:44.074     4898
1          1793  2019-02-28 23:49:58.632  2019-03-01 00:19:51.760     5200
2          1147  2019-02-28 23:55:35.104  2019-03-01 00:14:42.588     3803
3          1615  2019-02-28 23:41:06.766  2019-03-01 00:08:02.756     6329
4          1049  2019-02-28 23:49:47.699  2019-03-01 00:07:17.025     6488

    user_type  member_birth_year member_gender bike_share_for_all_trip  \
```

```
0  Subscriber             1974.0          Male                      Yes
1  Subscriber             1959.0          Male                       No
2  Subscriber             1983.0        Female                       No
3  Subscriber             1989.0          Male                       No
4  Subscriber             1992.0          Male                       No

    weekday  hour  duration_minutes  age
0  Thursday    23                26   45
1  Thursday    23                30   60
2  Thursday    23                19   36
3  Thursday    23                27   30
4  Thursday    23                17   27
```

[21]:
```
df.info()
```

```
<class 'pandas.core.frame.DataFrame'>
RangeIndex: 169513 entries, 0 to 169512
Data columns (total 12 columns):
 #   Column                  Non-Null Count   Dtype
---  ------                  --------------   -----
 0   duration_sec            169513 non-null  int64
 1   start_time              169513 non-null  object
 2   end_time                169513 non-null  object
 3   bike_id                 169513 non-null  int64
 4   user_type               169513 non-null  object
 5   member_birth_year       169513 non-null  float64
 6   member_gender           169513 non-null  object
 7   bike_share_for_all_trip 169513 non-null  object
 8   weekday                 169513 non-null  object
 9   hour                    169513 non-null  int64
 10  duration_minutes        169513 non-null  int64
 11  age                     169513 non-null  int64
dtypes: float64(1), int64(5), object(6)
memory usage: 15.5+ MB
```

[22]:
```
ratios = pd.read_csv('ratios.csv')
ratios
```

[22]:

	weekday	user_type	quantity	ratio
0	Monday	Customer	2216	0.140484
1	Tuesday	Customer	2197	0.139280
2	Wednesday	Customer	1997	0.126601
3	Thursday	Customer	2729	0.173006
4	Friday	Customer	2418	0.153290
5	Saturday	Customer	2067	0.131038
6	Sunday	Customer	2150	0.136300
7	Monday	Subscriber	22619	0.147126
8	Tuesday	Subscriber	27563	0.179284

```
 9   Wednesday  Subscriber     25590  0.166451
 10   Thursday  Subscriber     29934  0.194707
 11     Friday  Subscriber     24374  0.158541
 12   Saturday  Subscriber     11864  0.077170
 13     Sunday  Subscriber     11795  0.076721
```

[23]:
```
ratios.info()
```

```
<class 'pandas.core.frame.DataFrame'>
RangeIndex: 14 entries, 0 to 13
Data columns (total 4 columns):
 #   Column     Non-Null Count  Dtype
---  ------     --------------  -----
 0   weekday    14 non-null     object
 1   user_type  14 non-null     object
 2   quantity   14 non-null     int64
 3   ratio      14 non-null     float64
dtypes: float64(1), int64(1), object(2)
memory usage: 576.0+ bytes
```

Note that the above cells have been set as "Skip"-type slides. That means that when the notebook is rendered as http slides, those cells won't show up.

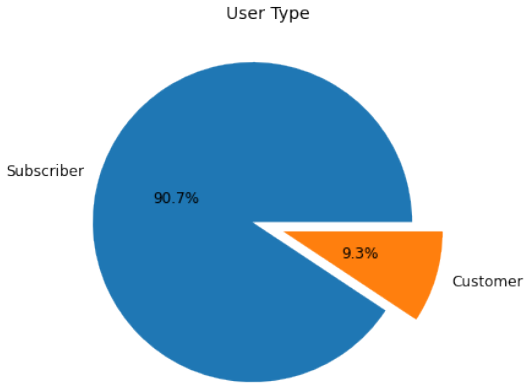
1.4 User Type by Weekday bike use

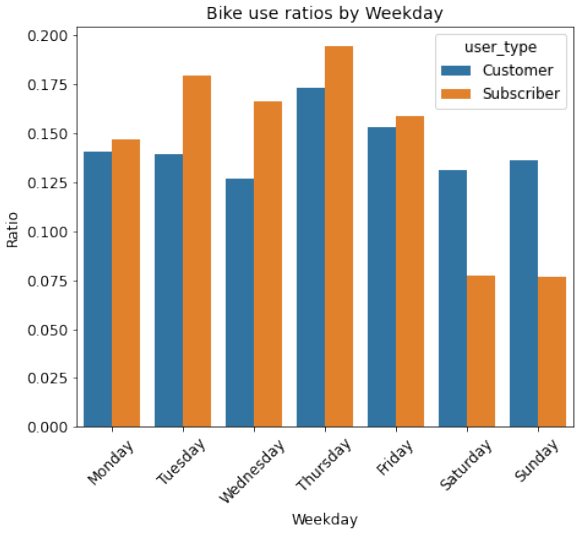
As we can see from the first graph most of the people using the service are Subscribers 90.7% the rest are random customers 9.3%.

In the second graph we can see an interesting observation - during the working week proportionally subscribers used the service more, however, on the weekend regular (random) customer used it proportionally more often. This means that on the weekend many casual bike riders use the service and people that use it during the week for commuting don't use the service as often.

[24]:
```
plt.rcParams.update({'font.size': 12})
```

[25]:
```
plt.figure(figsize=(16,6))
plt.subplot(1, 2, 1)
vals = df.user_type.value_counts()/df.shape[0]
labels = vals.keys()
plt.pie(x=vals, autopct="%.1f%%", explode=[0.1]*2, labels=labels, pctdistance=0.
↪5)
plt.title("User Type", fontsize=14);
plt.subplot(1, 2, 2)
sb.barplot(x='weekday', y='ratio', hue='user_type', data=ratios);
plt.xlabel('Weekday');
plt.ylabel('Ratio');
plt.xticks(rotation = 45);
plt.title("Bike use ratios by Weekday", fontsize=14);
```

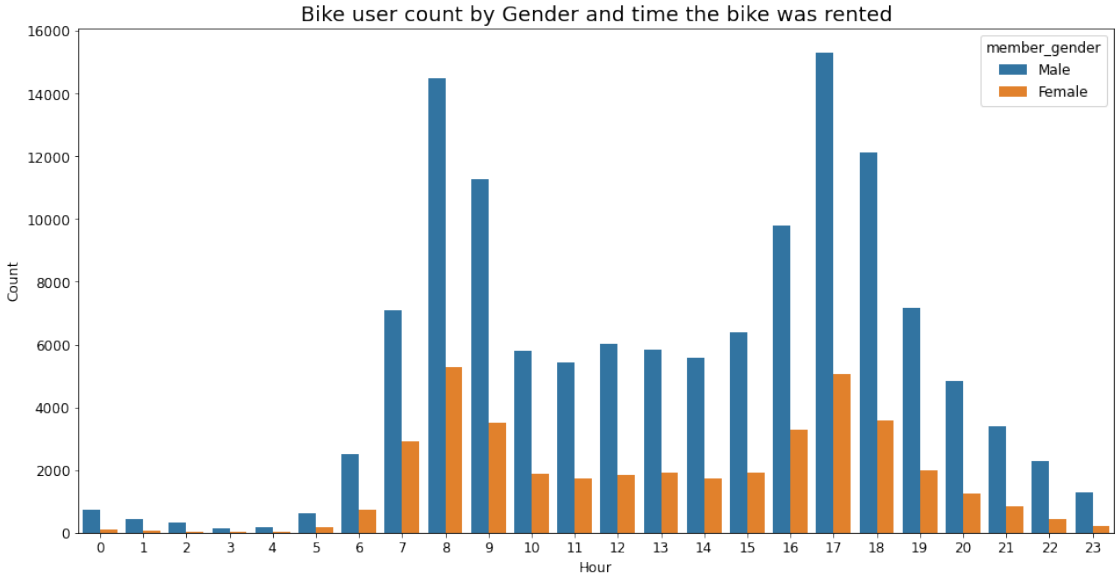




1.5 Bike user count by Gender and time of day the bike was rented

The hour at which the bikes are rented is also interesting. We can see that people mostly use the bikes around 8 AM and 5 PM. This indicates that the main way people use the bike is for commuting.

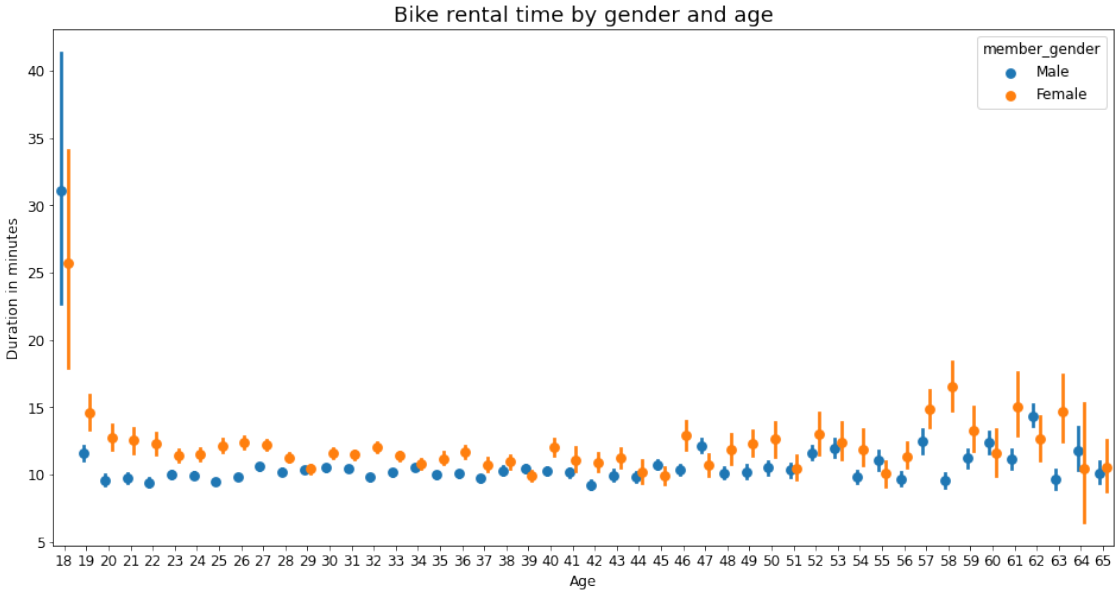
[26]:
```
fig = plt.figure(figsize = [16,8])
sb.countplot(data = df, x = 'hour', hue = 'member_gender');
plt.xlabel('Hour');
plt.ylabel('Count');
plt.title("Bike user count by Gender and time the bike was rented",␣
 ↪fontsize=18);
```



1.6 Bike rental time by gender and age

Below we can see an interesting observation. We can verify that female bike riders tend to rent the bike for longer. Also, we can verify that the youngest people rent the bike for longer periods. However, one interesting thing to note is that people that are older than 50 years tend to rent the bike for longer periods compared to 30 - 50-year-olds. This is a very interesting observation which may indicate the people after 50 use the bike more for exercise as a fitness tool as opposed to a commuting tool.

[27]:
```
fig = plt.figure(figsize = [16,8])
sb.pointplot(data=df, x='age', y='duration_minutes', hue='member_gender',␣
 ↪dodge=0.3, linestyles="");
plt.xlabel('Age');
plt.ylabel('Duration in minutes');
plt.title("Bike rental time by gender and age", fontsize=18);
```



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[ ]: