Pyber Ride Sharing Analysis

• The Bubble Plot indicates that number of rides and drivers both are more in urban cities as compared to suburban and rural cities. Although average fare is more for suburban and rural cities for few instances.

• All three pie charts show that urban cities have a good percentage of total fare, total rides and total drivers.

• From this analysis, this can be predicted that there are many new opportunities to expand the business in suburban and rural cities, in terms of hiring more drivers to operate in these cities.

In [1]:

```
# Dependencies
import matplotlib.pyplot as plt
import numpy as np
import pandas as pd
import seaborn as sns
```

In [2]:

```
# Read CSV files
city_data = pd.read_csv("RawData/city_data.csv")
ride_data = pd.read_csv("RawData/ride_data.csv")
```

In [3]:

```
# Drop any duplicate values
city_data = city_data.drop_duplicates('city')
# Check city data
city_data.head()
```

Out[3]:

	city	driver_count	type
0	Kelseyland	63	Urban
1	Nguyenbury	8	Urban
2	East Douglas	12	Urban
3	West Dawnfurt	34	Urban
4	Rodriguezburgh	52	Urban

In [4]:
```
# Check ride data
ride_data.head()
```

Out[4]:

	city	date	fare	ride_id
0	Sarabury	2016-01-16 13:49:27	38.35	5403689035038
1	South Roy	2016-01-02 18:42:34	17.49	4036272335942
2	Wiseborough	2016-01-21 17:35:29	44.18	3645042422587
3	Spencertown	2016-07-31 14:53:22	6.87	2242596575892
4	Nguyenbury	2016-07-09 04:42:44	6.28	1543057793673

In [5]:
```
# combine both data sets
pyber_data = city_data.merge(ride_data, on = 'city', how = 'outer')
pyber_data.head()
```

Out[5]:

	city	driver_count	type	date	fare	ride_id
0	Kelseyland	63	Urban	2016-08-19 04:27:52	5.51	6246006544795
1	Kelseyland	63	Urban	2016-04-17 06:59:50	5.54	7466473222333
2	Kelseyland	63	Urban	2016-05-04 15:06:07	30.54	2140501382736
3	Kelseyland	63	Urban	2016-01-25 20:44:56	12.08	1896987891309
4	Kelseyland	63	Urban	2016-08-09 18:19:47	17.91	8784212854829

Bubble Plot of Ride Sharing Data

In [6]:
```
# Create separate data frames based on city types - Urban, Suburban and Rural
urban_city = pyber_data.loc[(pyber_data["type"] == "Urban")]
suburban_city = pyber_data.loc[(pyber_data["type"] == "Suburban")]
rural_city = pyber_data.loc[(pyber_data["type"] == "Rural")]
```

In [7]:

```
# Per city calculations of Average Fare, Total Rides and Total Drivers for Urb
an cities
avg_fare_urban_city = urban_city.groupby(['city'])['fare'].mean()
total_rides_urban_city = urban_city.groupby(['city']).count()['ride_id']
total_drivers_urban_city = urban_city.groupby(['city'])['driver_count'].value_
counts()

# Per city calculations of Average Fare, Total Rides and Total Drivers for Sub
urban cities
avg_fare_suburban_city = suburban_city.groupby(['city'])['fare'].mean()
total_rides_suburban_city = suburban_city.groupby(['city']).count()['ride_id']
total_drivers_suburban_city = suburban_city.groupby(['city'])
['driver_count'].value_counts()

# Per city calculations of Average Fare, Total Rides and Total Drivers for Rur
al cities
avg_fare_rural_city = rural_city.groupby(['city'])['fare'].mean()
total_rides_rural_city = rural_city.groupby(['city']).count()['ride_id']
total_drivers_rural_city = rural_city.groupby(['city'])['driver_count'].value_
counts()
```

In [8]:

```
# Create scatter plots for Urban, Suburban and Rural cities
plt.scatter(total_rides_urban_city, avg_fare_urban_city,s=total_drivers_urban_
city*10,
            marker ='o', facecolors ="lightcoral", edgecolors='black',alpha =
0.5, label="Urban")

plt.scatter(total_rides_suburban_city, avg_fare_suburban_city,s=total_drivers_
suburban_city*10,
            marker ='o', facecolors ="lightskyblue", edgecolors='black',alpha
= 0.5, label="Suburban")

plt.scatter(total_rides_rural_city, avg_fare_rural_city,s=total_drivers_rural_
city*10,
            marker ='o', facecolors ="gold", edgecolors='black',alpha = 0.55,
label="Rural")
```

Out[8]:

```
<matplotlib.collections.PathCollection at 0x1ec0452e630>
```

In [9]:

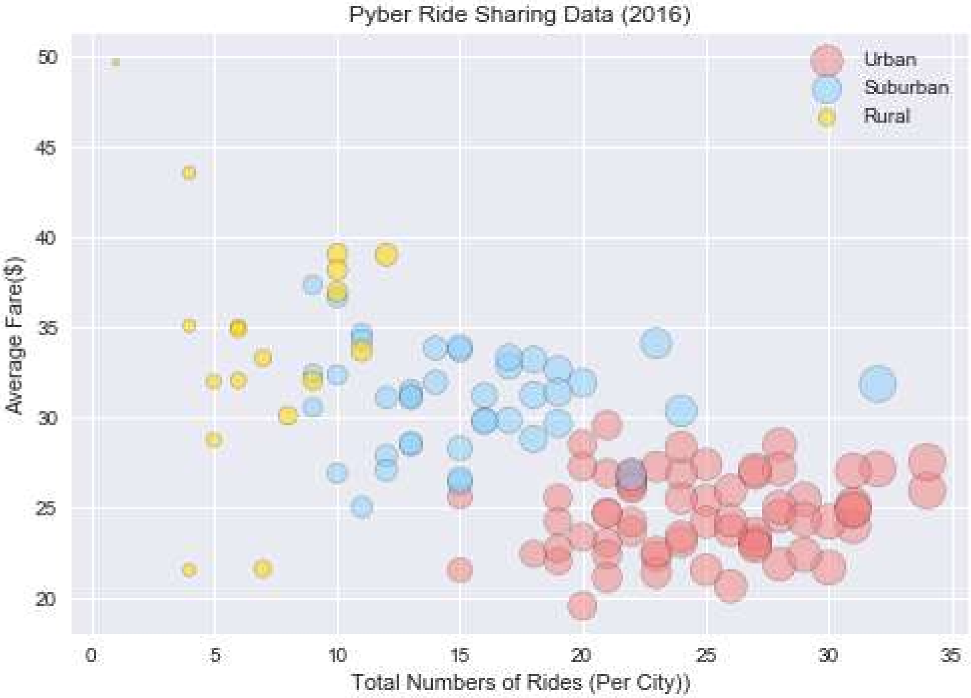
```
# Chart title
plt.title("Pyber Ride Sharing Data (2016)")
# x label
plt.xlabel("Total Numbers of Rides (Per City))")
# y label
plt.ylabel("Average Fare($)")
# legend
plt.legend(loc='upper right')
```

Out[9]:

```
<matplotlib.legend.Legend at 0x1ec043ff6d8>
```

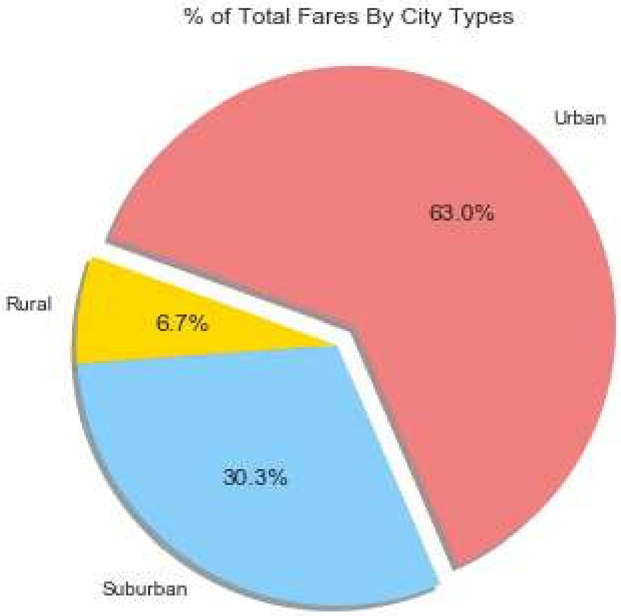
In [10]:

```
# Save an image of the chart and print to screen
plt.savefig("Pyber Ride Sharing.png")
plt.show()
```



Total Fares by City Type¶

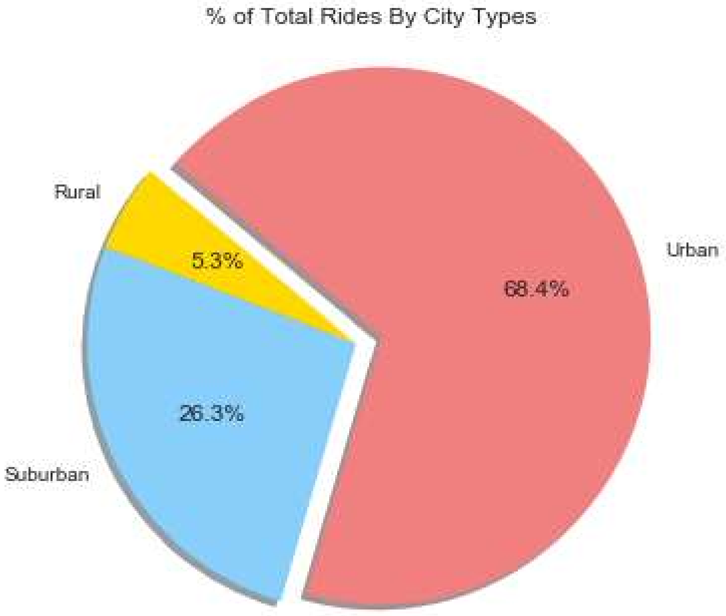
```
In [11]: # Calculate Total Fare by City Type
         total_fare = pyber_data.groupby(['type'])['fare'].sum()
         # Labels for the sections of our pie chart
         labels = ["Rural","Suburban","Urban" ]
         # The colors of each section of the pie chart
         colors = ["gold","lightskyblue","lightcoral"]
         explode = (0, 0, 0.1)
         plt.title("% of Total Fares By City Types")
         plt.pie(total_fare, explode=explode, labels=labels, colors=colors, autopct="%
         1.1f%%",shadow=True, startangle=160)
         plt.axis("equal")
         plt.savefig("% of Total Fares By City Types.png")
         plt.show()
```



Total Rides by City Type

In [12]:

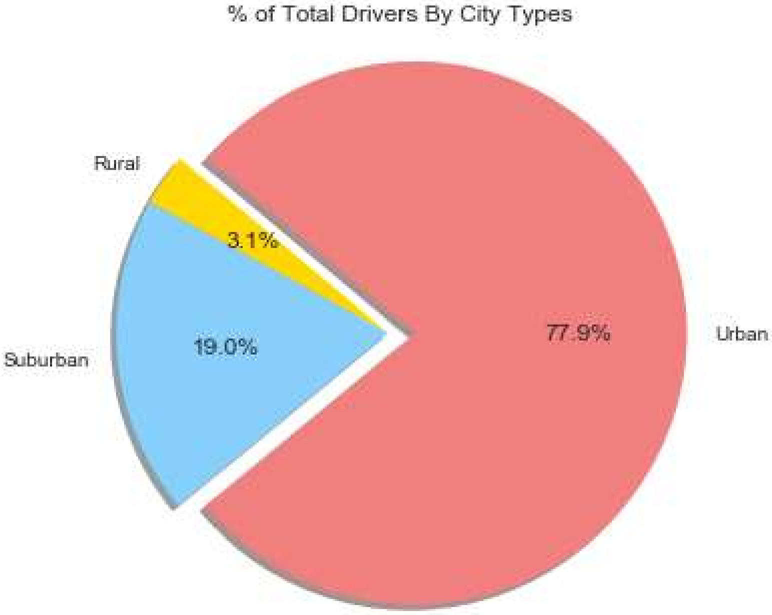
```
# Calculate Total Fare by City Type
total_rides = pyber_data.groupby(['type'])['ride_id'].count()
# Labels for the sections of our pie chart
labels = ["Rural","Suburban","Urban" ]
# The colors of each section of the pie chart
colors = ["gold","lightskyblue","lightcoral"]
explode = (0, 0, 0.1)
plt.title("% of Total Rides By City Types")
plt.pie(total_rides, explode=explode, labels=labels, colors=colors,
        autopct="%1.1f%%", shadow=True, startangle=140)
plt.axis("equal")
plt.savefig("% of Total Rides By City Types.png")
plt.show()
```



Total Drivers by City Type

In [13]:

```
# Calculate Total Drivers by City Type
total_drivers = city_data.groupby(['type'])['driver_count'].sum()
# Labels for the sections of our pie chart
labels = ["Rural","Suburban","Urban" ]
# The colors of each section of the pie chart
colors = ["gold","lightskyblue","lightcoral"]
explode = (0, 0, 0.1)
plt.title("% of Total Drivers By City Types")
plt.pie(total_drivers, explode=explode, labels=labels, colors=colors,
        autopct="%1.1f%%", shadow=True, startangle=140)
plt.axis("equal")
plt.savefig("% of Total Drivers By City Types.png")
plt.show()
```


% of Total Drivers By City Types
Rural
Suburban
Urban