

```
In [291]: import matplotlib.pyplot as plt  
import numpy as np  
import pandas as pd
```

```
In [292]: citydf = pd.read_csv("city_data.csv")  
ridedf = pd.read_csv("ride_data.csv")
```

```
In [293]: groupcity = ridedf.groupby(['city'])  
groupcity.count().head(10)
```

Out[293]:

	date	fare	ride_id
city			
Alvarezhaven	31	31	31
Alyssaberg	26	26	26
Anitamouth	9	9	9
Antoniomouth	22	22	22
Aprilchester	19	19	19
Arnoldview	31	31	31
Campbellport	15	15	15
Carrollbury	10	10	10
Carrollfort	29	29	29
Clarkstad	12	12	12

```
In [294]: avgfare = groupcity["fare"].mean()  
avgfare.head()
```

```
Out[294]: city  
Alvarezhaven      23.928710  
Alyssaberg        20.609615  
Anitamouth        37.315556  
Antoniomouth      23.625000  
Aprilchester      21.981579  
Name: fare, dtype: float64
```

```
In [295]: datasum = {"Average Fare":avgfare, "Rides Per City": cityrides}  
datasum = pd.DataFrame(datasum)
```

```
In [296]: datasum.head(5)
```

```
Out[296]:
```

	Average Fare	Rides Per City
city		
Alvarezhaven	23.928710	31
Alyssaberg	20.609615	26
Anitamouth	37.315556	9
Antoniomouth	23.625000	22
Aprilchester	21.981579	19

```
In [297]: citydf = citydf.dropna(how='any')
```

```
In [298]: datasum = datasum.dropna(how='any')
```

```
In [299]: citydf.head()
```

```
Out[299]:
```

	city	driver_count	type
0	Alvarezhaven	21	Urban
1	Alyssaberg	67	Urban
2	Anitamouth	16	Suburban
3	Antoniomouth	21	Urban
4	Aprilchester	49	Urban

```
In [300]: citydf = citydf.set_index(['city'])
```

```
In [301]: citydf.head()
```

```
Out[301]:
```

	driver_count	type
city		
Alvarezhaven	21	Urban
Alyssaberg	67	Urban
Anitamouth	16	Suburban
Antoniomouth	21	Urban
Aprilchester	49	Urban

```
In [302]: finaldf = pd.concat([citydf, datasum], axis=1)
```

```
In [303]: finaldf.head()
```

```
Out[303]:
```

	driver_count	type	Average Fare	Rides Per City
city				
Alvarezhaven	21	Urban	23.928710	31
Alyssaberg	67	Urban	20.609615	26
Anitamouth	16	Suburban	37.315556	9
Antoniomouth	21	Urban	23.625000	22
Aprilchester	49	Urban	21.981579	19

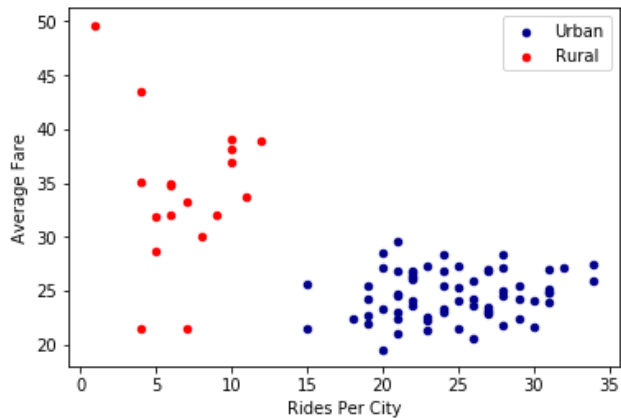
```
In [304]: urban = finaldf.loc[finaldf["type"] == "Urban"]  
          suburban = finaldf.loc[finaldf["type"] == "Suburban"]  
          rural = finaldf.loc[finaldf["type"] == "Rural"]
```

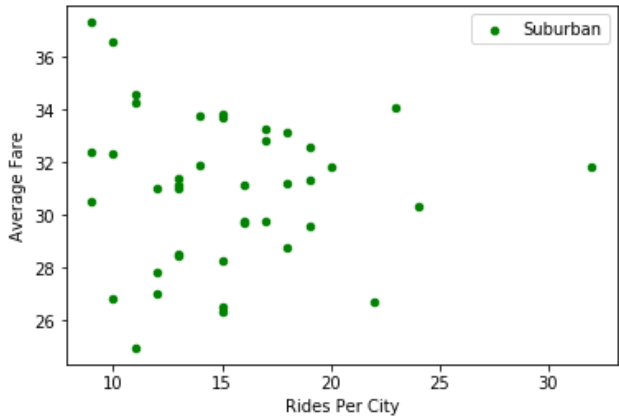
```
In [305]: ax = urban.plot.scatter(x='Rides Per City', y='Average Fare',  
                                color='DarkBlue', label='Urban');  
          suburban.plot.scatter(x='Rides Per City', y='Average Fare',  
                               color='Green', label='Suburban');  
          rural.plot.scatter(x='Rides Per City', y='Average Fare',  
                             color='Red', label='Rural', ax=ax)
```

```
Out[305]: <matplotlib.axes._subplots.AxesSubplot at 0x1101a32e8>
```



```
In [306]: plt.show()
```





```
In [307]: finaldf.head()
```

```
Out[307]:
```

	driver_count	type	Average Fare	Rides Per City
city				
Alvarezhaven	21	Urban	23.928710	31
Alyssaberg	67	Urban	20.609615	26
Anitamouth	16	Suburban	37.315556	9
Antoniomouth	21	Urban	23.625000	22
Aprilchester	49	Urban	21.981579	19

```
In [308]: type_group = finaldf.groupby('type')
```

```
In [309]: count_group = type_group['Average Fare'].sum()
```

```
In [310]: count_group.head()
```

```
Out[310]: type
Rural      615.728572
Suburban   1268.627391
Urban      1623.863390
Name: Average Fare, dtype: float64
```

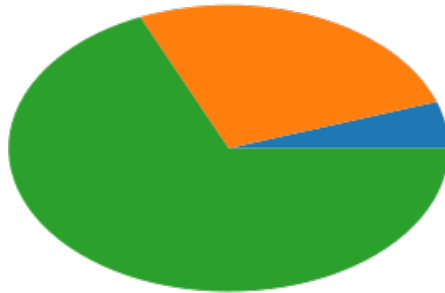
```
In [321]: plt.pie(count_group)
plt.show()
```



```
In [323]: count_riders = type_group['Rides Per City'].sum()  
count_riders.head()
```

```
Out[323]: type  
Rural      125  
Suburban   625  
Urban     1625  
Name: Rides Per City, dtype: int64
```

```
In [324]: plt.pie(count_riders)  
plt.show()
```

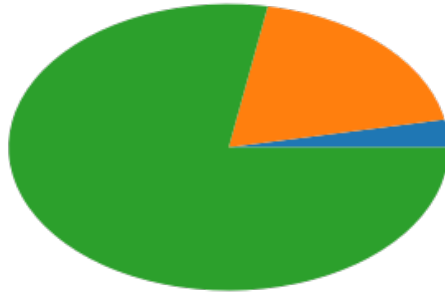


```
In [325]: count_drivers = type_group['driver_count'].sum()  
count_drivers.head()
```

```
Out[325]: type  
Rural      104  
Suburban   638  
Urban     2607  
Name: driver_count, dtype: int64
```



```
In [326]: plt.pie(count_drivers)  
plt.show()
```



```
In [ ]: #Suburban and rural rides are the most expensive  
#Urban cities have the most rides  
#Urban cities have the most drivers
```