Rent Analysis in Orlando in the Past 10 Years

Introduction

A new research reveals that Orlando's 75 million visitors generated $75.2 billion in annual economic impact for Central Florida or about $1,000 per traveler, which is a 6.4% increase over 2019. Leading global research firm Oxford Economics analyzed tourism's impact across all business sectors, from food suppliers and utility companies to insurance and health care. The new study analyzed annual impact from 2019. According to the study, the region's largest employer, tourism supports 41% of the workforce (463,004 jobs). Orlando's tourism industry generated $5.8 billion in local and state tax revenue in 2018. The taxes visitors pay go toward funding local government services important to all residents, such as public safety, infrastructure projects, parks and recreation, school construction and more. In the last five years, a 20% growth in visits has spurred nearly 25% growth in spending, supporting 13% growth in employment in Central Fla (2014 vs 2018).

To clearly understand the aspect of growth in any industry, it is very important to study the area very well. I have to mention that one of the reasons why that many major companies target the Greater Orlando Area to grow their businesses is because Metro Orlando was number 2 in the nation among areas adding the most people last year, growing by more than 250,000 residents. Orlando's population grew from 2,512,917 to 2,772,962 from July 2018 to July 2019, a difference of 259,775. About 1.1 million people were employed in the area, and total wages for the quarter that ended on March 31, 2014, were over $10 billion, a one-year increase of 4.7 percent. The average annualized salary was $42,644, a one-year increase of 2.6 percent. The Metro Orlando Economic Development Commission's March 2018 economic indicators report shows that the leisure and hospitality industry, at 21 percent of all jobs,

remained the leading employer in the area. One in three jobs in Central Florida is tied to tourism, although area leadership is persistently working to strengthen and diversify the regional economy. The next-largest jobs segment in March 2018 was professional and business services, 17 percent, followed by education and health services, 12 percent. Industries experiencing growth in the four-county area also included construction, which grew 8.6 percent; manufacturing, which increased 4.5 percent; leisure and hospitality, up 4.3 percent; trade, up 4.2 percent; and transportation and utilities, up 3.6 percent. Government had the lowest growth rate, at 0.03 percent.

Another area that I focus on is diversification. Since 2013, the Florida state government has invested in strategic transportation projects, created the first-ever statewide freight mobility and trade plan, and initiated innovative programs for employer-driven training and company-specific export development. Florida created over 23,000 new jobs in trade and logistics from 2015 to 2017 and more than 9,000 jobs in manufacturing. The value of goods exported by Florida companies increased from $55 billion in 2010 to a record $65 billion in 2012. As a result, of I am currently working on my final proposal to secure a partnership with a local State College that will help with the student learning outcome and with the State curriculum process.

The demand for housing in the Greater Orlando Area has been significantly increased in the past 20 years. At $1,151, real median gross rent in Orlando was at its highest level in 2017 since the series began in 2005. At $1,170, real average gross rent in Orlando was at its highest level in 2017 since the series began in 2005. The median rent more accurately depicts rental rates in the middle of the distribution of rents and is thus preferred in the analysis below. 2018 Orlando median and average rent data will be released in September of 2019.

Methods

Data sources

Unlike the previous two projects, I have used private local statistics to select the datasets for this project. There are two datasets that I will examine. The primary data has not been generated by surveys, interviews, and experiments. It is a normal dataset that was generated from kids.kiddle.co, and it is designed for understanding and solving the research problem at hand. The secondary data truly follows the definition of a real secondary data. It is also generated by www.deptofnumbers.com. It will serve as supporting data for the project. US. Census Bureau is about the government-informed statistics on the lives of US citizens including population, economy, education, geography, and more, which is a great source to gather data.

- Data 1: https://kids.kiddle.co/Greater_Orlando
- Data 2: https://www.deptofnumbers.com/rent/florida/orlando/

Statistical methods

I have decided to examine the association between obesity independent variables and state percentage of poverty prevalence by using ordinary least squares (OLS). OLS is a variation of linear regression, a statistical method that examines associations between multiple independent variables and a single dependent variable; once the assumptions are satisfied, the regression output indicates the strength of the association between the dependent variable and each of the independent variables. These assumptions, include linear parameters, random sampling, no multicollinearity, no autocorrelation, a conditional mean of zero, and normally

distributed error terms; all of them were satisfied, meaning that our OLS models are efficient and represent a linear unbiased estimator of variable coefficients.

I also believe that simple linear regression may be a great way to examine my single input. Because simple linear regression requires statistical properties from the data such as means, standard deviations, correlations, and covariance, all the data must be available to traverse and calculate statistics.

Visualization methods

I will use Python and Power BI for this project. I am not very comfortable using Python, but I am sure that its applications are very well aligned with this type of projects. I will use NumPy to assist me with any type of linear algebra, Fourier transform, and matrices. With Pandas, the DataFrames allow me to store and manipulate tabular data in rows of observations and columns of variables, which will assist me with data wrangling. I will also use Matplotlib for my visual applications. It allows me visual access to huge amounts of data in easily digestible visuals. Matplotlib consists of several plots like line, bar, scatter, and histogram.

I will also use Power BI for the following reasons.

- Power BI offers a wide range of custom visualizations. That means visualizations made by developers for a specific use. Custom visuals are also available on Microsoft marketplace.
- In Power BI, I also have the option to upload and view my data in Excel. I will be able to select, filter, and slice data in a Power BI report or dashboard and put it on Excel. I will be able to open Excel and view the same data in tabular form in an Excel spreadsheet.

Another reason why I will use Power BI is because the data visualization tool is very attractive, intuitive, and interactive. It is very easy to create and understand data through visualizations in Power BI.

Data Analysis and Research Questions

There are several reasons behind rent increase in any economy. New employers and rising local economy are the most reasons why the rental market in Orlando has been increased significantly in the past 20 years. When a large company moves into an area, it will bring increased job opportunity, increased incomes and a reduced unemployment rate and all factors that help raise housing prices, values and, accordingly, rental rates. People want to live near where they work, so your property will become more desirable. Housing markets across the country are experiencing growth as the economy continues its slow, but steady, recovery. In mid-2013, housing prices were up by 18.4 percent over the past 16 months, according to a report in The New York Times. Raising rent to keep up with this increase in housing prices makes financial sense.

For this project, I will answer the questions at the presentation. I think that it makes sense that to make sure I use the statistical analysis and predictive analysis to answer the questions.

- Is Orlando literally the worst place in the country right now for affordable housing?
- How does the household income affect the housing affordability in Orlando?
- How does the Orlando housing market look like in the next ten years?

Results

While the increase in 2019 has been slower than previous years, it has still gone up an average of $3 per month. As of July, the average cost of rent per month was $1,592 nationally. In larger metro areas, rents went up substantially, $64 per month on average. And rents rose in 92 percent of cities in the U.S.

As I mention in the statistical method section, I am using simple linear regression and ordinary least squares for my analysis. Well, I can clearly conclude that ordinary least squares regression was not helpful at all for the statistical analysis. I was kind of was happy with the result although I was expecting the correlation between obesity and poverty to be higher. As you can notice, the correlation is 0.9557821.

Based on the results that we got from analyzing the dataset, rent in Orlando has increased significantly in the past few years. Rent for one-bedroom apartment has increased 48% overall from July 2011 to April 2019. Orlando may not be the worst city in the country for rent affordability, but it is not the cheapest either.

One Bedroom		
Lowest	$684	July 2011
Average	$1,016	July 2015
Highest	$1,312	April 2019

- Increased by 48% overall from July 2011 to April 2019.
- Increased by 32.7% from July 2011 to July 2015.
- Increased by 22.5% from July 2015 to April 2019.

Two Bedrooms		
Lowest	$891	December 2011
Average	$1,185	April 2015
Highest	$1,488	March 2019

- Increased by 40.12% overall from July 2011 to April 2019.
- Increased by 24.81% from July 2011 to July 2015.
- Increased by 20.37% from July 2015 to April 2019.

In [74]:
```
from pandas import Series, DataFrame

import numpy as np

import string
import re
import matplotlib.pyplot as plt
from matplotlib.pyplot import rcParams

%matplotlib inline
from collections import Counter
```

In [75]:
```
import keras
```

In [76]:
```
from csv import reader
from datetime import datetime
```

In [77]:
```
import pandas as pd
import json
import sys
import warnings
```

In [78]:
```
import sklearn
from sklearn import datasets, linear_model
from sklearn.model_selection import train_test_split
from sklearn.tree import DecisionTreeClassifier
from sklearn.ensemble import RandomForestClassifier, BaggingClassifier
from sklearn.linear_model import LinearRegression
```

In [79]:
```
df = ("C:\\Users\\orlan\Rent_Orlando_10years.csv")
```

In [80]:
```
data1 = pd.read_csv(df)
```

In [81]:
```
print (data1)
```

```
      Month  Two_beds  One_beds
0    11-Jan       907       718
1    11-Feb       903       708
2    11-Mar       913       725
3    11-Apr       904       717
4    11-May       899       705
..      ...       ...       ...
103  20-Jan      1407      1223
104  20-Mar      1402      1229
105  20-Apr      1366      1195
106  20-May      1426      1253
107  20-Jun      1427      1257

[108 rows x 3 columns]
```

In [82]:
```
data1.describe()
```

Out[82]:

	Two_beds	One_beds
count	108.000000	108.000000
mean	1185.203704	1016.064815
std	194.894688	189.793605
min	891.000000	684.000000
25%	983.000000	835.500000
50%	1221.000000	1015.000000
75%	1340.250000	1175.250000
max	1488.000000	1312.000000

In [83]:
```
data1.min()
```

Out[83]:
```
Month       11-Apr
Two_beds       891
One_beds       684
dtype: object
```

In [84]:
```
data1.max()
```

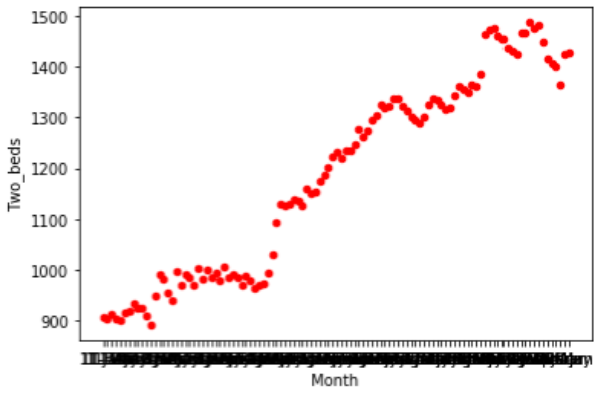
Out[84]:
```
Month       20-May
Two_beds      1488
One_beds      1312
dtype: object
```

In [ ]:
```

```

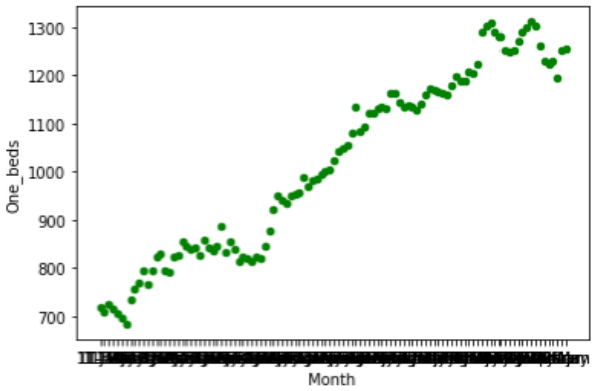
In [86]:
```
data1.plot(kind='scatter', x='Month', y='Two_beds', c=['red'])
```

Out[86]:
```
<matplotlib.axes._subplots.AxesSubplot at 0x2966fefbac8>
```



In [87]:
```
data1.plot(kind='scatter', x='Month', y='One_beds', c=['green'])
```

Out[87]:
```
<matplotlib.axes._subplots.AxesSubplot at 0x2967003cdc8>
```



In [88]:
```
import scipy
import math
```

In [89]:
```
linreg = LinearRegression()
```

In [90]:
```
Two_beds = np.array([907,903,913,904,899,914,919,933,925,923,909,891,949,991,9
81,954,939,997,968,989,983,970,1003,982,1000,983,994,979,1006,983,991,985,968,
986,977,962,968,973,994,1031,1092,1128,1125,1130,1139,1135,1125,1160,1149,1153
,1175,1188,1202,1223,1232,1219,1234,1236,1248,1278,1261,1275,1295,1304,1326,13
20,1322,1339,1338,1322,1313,1303,1294,1289,1303,1326,1337,1336,1327,1318,1320,
1344,1363,1357,1351,1365,1362,1387,1465,1475,1476,1462,1457,1438,1432,1426,146
7,1469,1488,1477,1484,1448,1416,1407,1402,1366,1426,1427])
```

In [94]:
```
One_beds = np.array([718,708,725,717,705,698,684,734,758,770,794,766,796,823,8
31,794,793,824,826,856,847,839,841,827,857,842,836,846,887,834,854,838,815,824
,821,815,823,820,847,879,921,952,942,936,951,955,956,989,969,981,986,994,1000,
1006,1024,1043,1049,1056,1081,1134,1085,1095,1121,1122,1133,1135,1131,1162,116
3,1143,1134,1137,1134,1128,1140,1160,1174,1169,1166,1164,1160,1179,1199,1189,1
189,1207,1204,1224,1290,1303,1309,1291,1282,1253,1248,1251,1271,1289,1301,1312
,1303,1262,1229,1223,1229,1195,1253,1257])
```

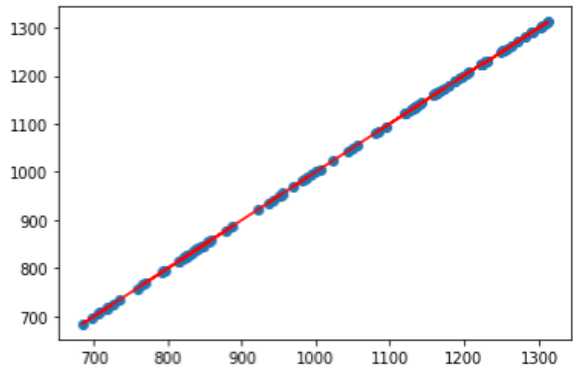
In [95]:
```
Two_beds = Two_beds.reshape(-1, 1)
```

In [96]:
```
linreg.fit(Two_beds, One_beds)
```

Out[96]:
```
LinearRegression(copy_X=True, fit_intercept=True, n_jobs=None, normalize=Fals
e)
```

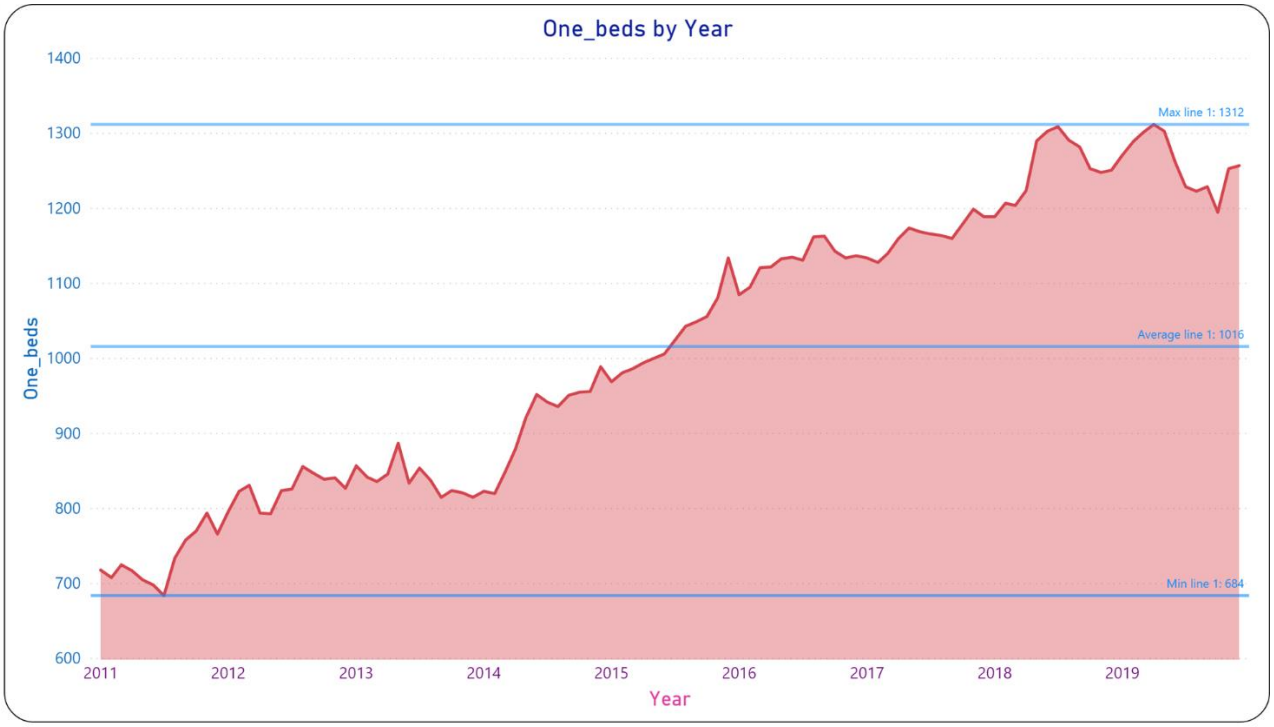
In [97]:
```
One_beds_pred = linreg.predict(Two_beds)
```

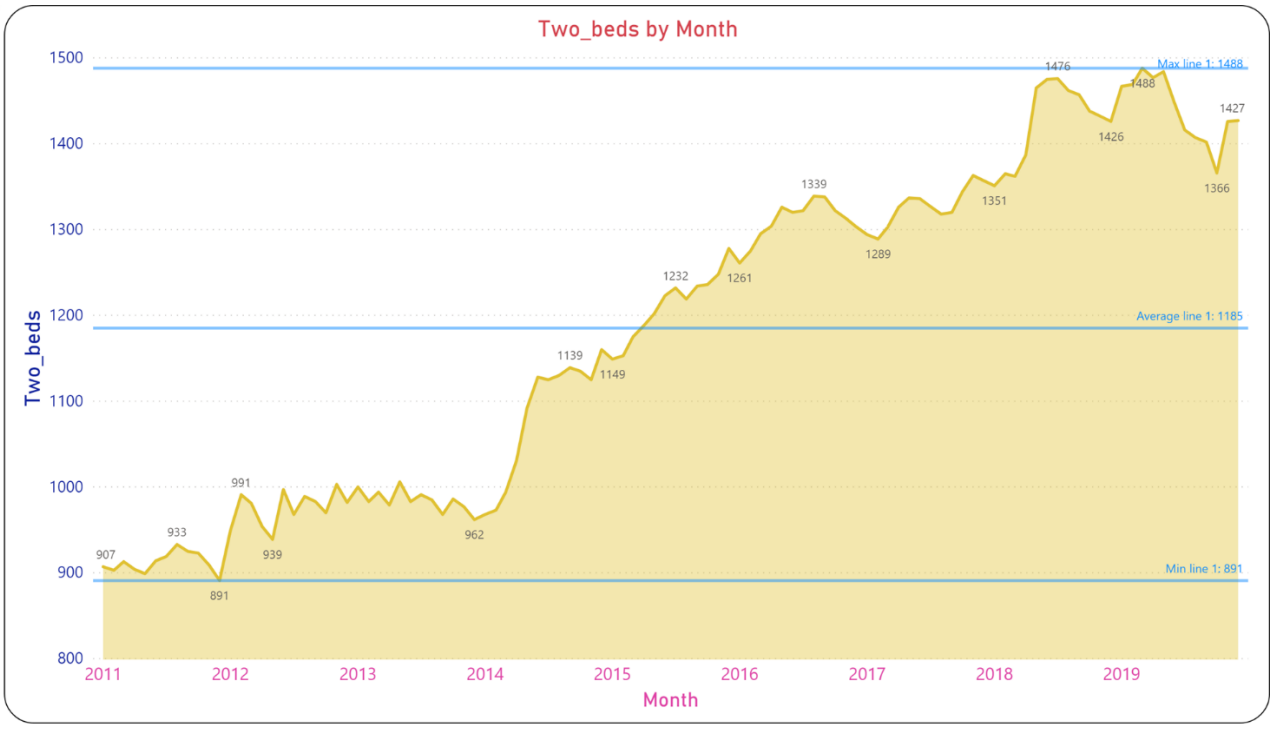
In [98]:
```
plt.scatter(Two_beds,One_beds)
plt.plot(Two_beds, One_beds_pred, color='red')
plt.show()
```

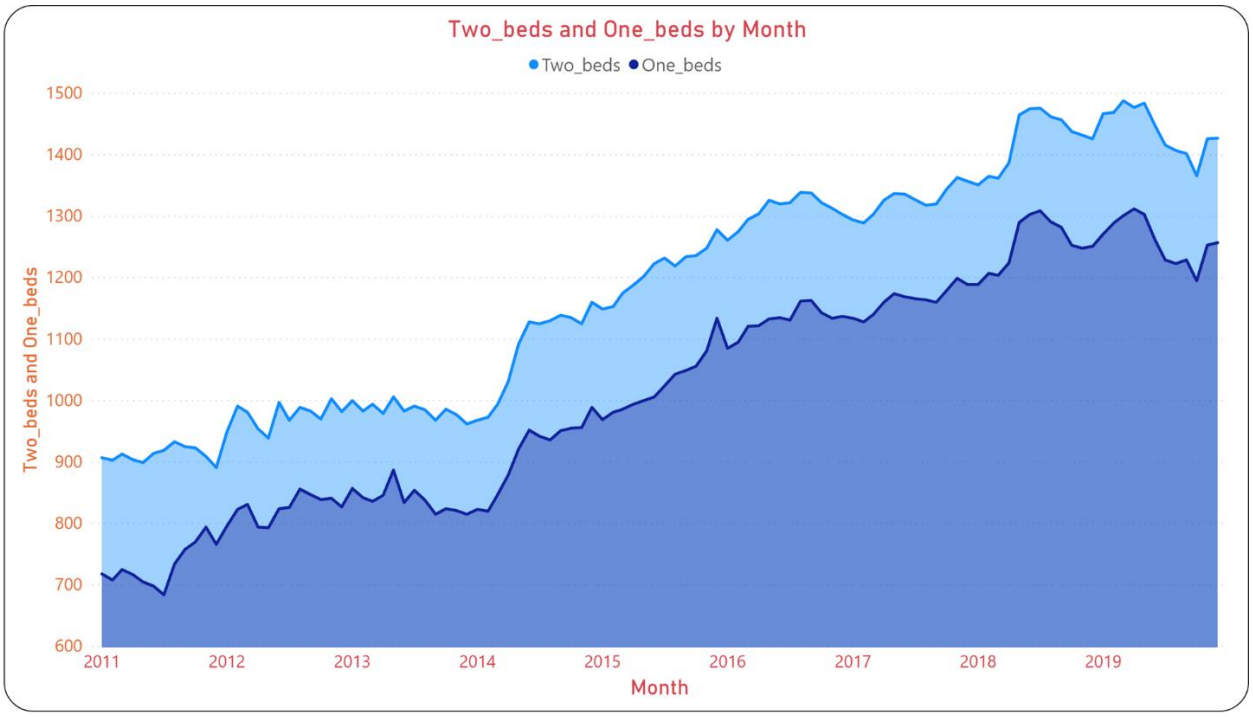


In [ ]:
```

```


One_beds by Year
One_beds
Year
Max line 1: 1312
Average line 1: 1016
Min line 1: 684
1400
1300
1200
1100
1000
900
800
700
600
2011
2012
2013
2014
2015
2016
2017
2018
2019


Two_beds by Month
Two_beds
Month
Max line 1: 1488
Average line 1: 1185
Min line 1: 891
1500
1400
1300
1200
1100
1000
900
800
907
933
891
991
939
962
1139
1149
1232
1261
1339
1289
1351
1476
1488
1426
1366
1427
2011
2012
2013
2014
2015
2016
2017
2018
2019



Conclusion

If you are moving to the Orlando area as renter hoping to save enough to buy a home, this may be scary news. The best advice we can give you is to rent a home owned by one of the millions and millions of decent landlords out there. And to do your best to be a respectful and considerate tenant. Landlords sometimes get a bad rap, but most of them are not bad people. They may raise your rent a little bit each year to make sure they have enough to pay for their rising costs and fees, but in doing so they're able to make sure you have a properly maintained and nicely run place to live.

If you are a landlord in the Orlando area rising rents are obviously a good thing. Higher rents mean more cash flow. Rising demand for rentals means lower vacancy rates, which also helps you make more cash flow. That said, not all areas in Orlando are experiencing rising rents and

lower vacancy rates, but it still really matters where and when you buy your rental property. Therefore, it is so important to always perform a market analysis in the area you are looking to buy before purchasing a rental property.

Acknowledgments

There are so many articles, data, and organizations that I owe great credit and great deals of respects to. After reading several articles, I realized that I needed to add more concepts into my research to make my projects more appealing and concrete. These articles have really helped me to understand some of the more important ways to structure my analysis. Finally, I must thank my family especially my wife to allow me to skip so many family activities to focus on working in this project.

Author Information

Corresponding Author	Alberto Luma, 5802 Coquyt Drive, Mount Dora, Fl, 32757. Email: lumaalberto@gmail.com
Author Affiliations	Bellevue University DSC680 – Applied Data Science

References:

1. https://kids.kiddle.co/Greater_Orlando
2. https://www.niche.com/places-to-live/search/best-neighborhoods/m/orlando-metro-area/
3. https://en.wikipedia.org/wiki/Greater_Orlando
4. https://www.city-data.com/city/Orlando-Florida.html

5. https://www.in2013dollars.com/Rent-of-primary-residence/price-inflation
6. https://www.deptofnumbers.com/rent/florida/orlando/
7. https://www.abodo.com/blog/2018-annual-rent-report/
8. https://www.numbeo.com/cost-of-living/in/Orlando
9. https://www.orlandorealtors.org/marketreports
10. https://www.orlandoweekly.com/Blogs/archives/2019/03/15/orlando-is-literally-the-worst-place-in-the-country-right-now-for-affordable-housing