What An Expensive Time To Be Alive

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Research Topic: Why is it so expensive to be alive today? Which factors are attributed to the increased cost of living in Florida? Population? Rental prices? The barrier of entry to purchase a home? Overall state of the economy? What other factors are contributing to the rising cost of living in Florida?

Economic Indicators Review: Median Income
Line Chart I presented below comprises information related to median income levels in Florida across six consecutive years, spanning from 2017 to 2022. These data points offer valuable insights into the income trends within this specific time period. It indicates that median income started at $62,600 in 2017, experienced fluctuations over the following years, with a peak of $66,480 in 2019, before gradually decreasing to $65,110 in 2020 (possibly due to COVID) and $64,410 in 2021. We see there was a slight increase in median income to $65,370 in 2022.

Line Chart I
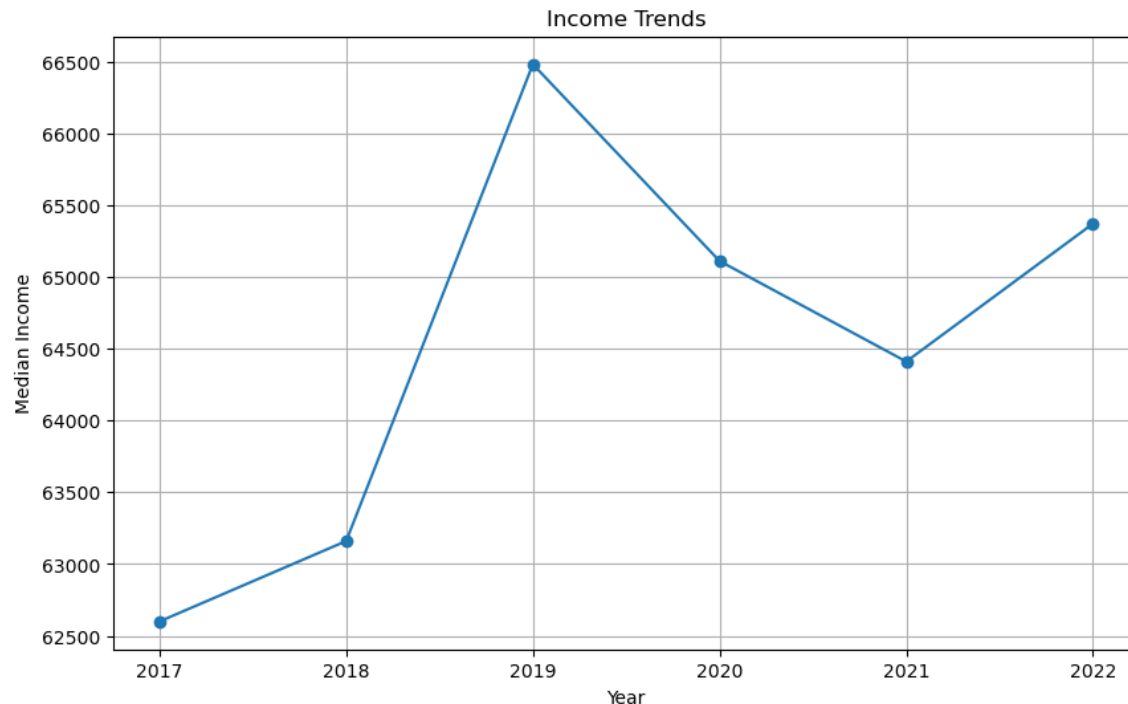
Summary Statistics Table I presents population data for Florida over a six-year period. The population numbers are in Thousand of People. The summary statistics below offer some insights into the central tendency and variability of the population data. We see a steady growth rate of population increase in Florida since 2017. From 2017-2020 we saw around 600,000 people move to the sunshine state. We saw slightly more move from 2020-2022. These statistics provide a snapshot of Florida's population trends, aiding in the analysis of changes and patterns over the specified time frame.

Summary Statistics Table I

```
Summary Statistics:
       Median Income        Year
count      6.000000     6.000000
mean   64521.666667  2019.500000
std     1446.394368     1.870829
min    62600.000000  2017.000000
25%    63472.500000  2018.250000
50%    64760.000000  2019.500000
75%    65305.000000  2020.750000
max    66480.000000  2022.000000
```

Economic Indicators Review: Average Prices and Listings of Homes
The question at hand is whether an increase in Population has had an effect on the housing
market. To determine this answer, we posed the various hypotheses for Florida and Miami. Our
hypothesis was for the relationship between pricing and listing in Miami vs FL.

Ho: There is not a statistically significant relationship to changes in housing prices and listings
available in Miami vs FL.
Ha: There is a statistically significant relationship to changes in housing prices and listings
available in Miami vs FL.
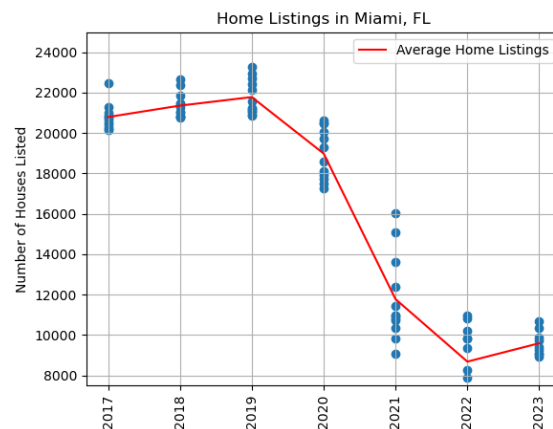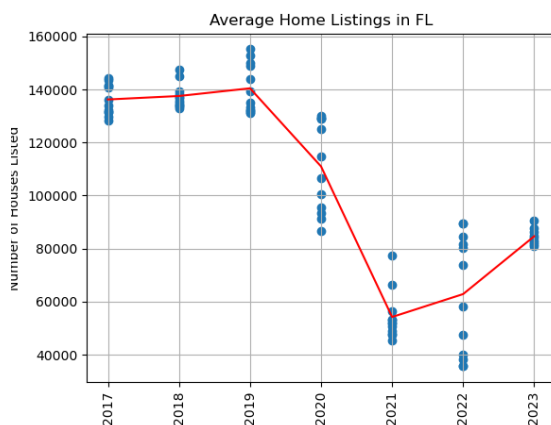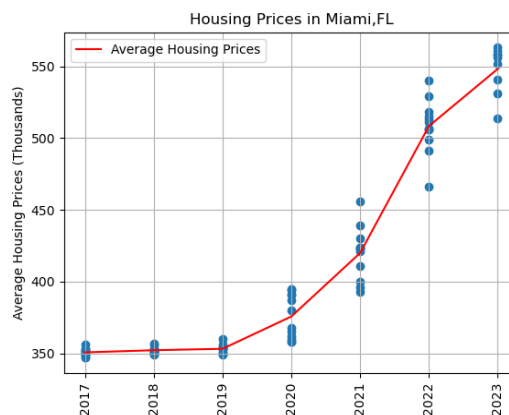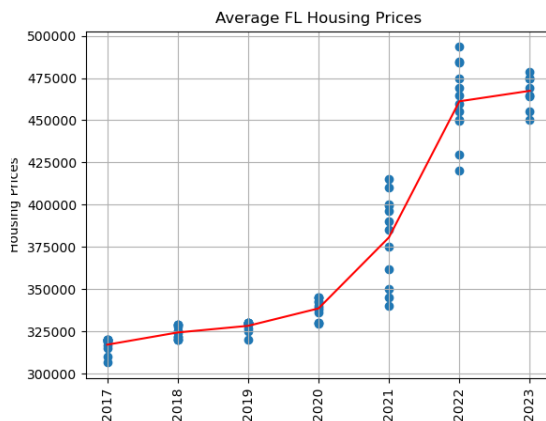
Using a one sample t-test, a p-value of less than the threshold ($P < .05$) was derived, so we can
reject the null hypothesis and note there is a statistically significant relationship in the house
pricing and listings in Miami vs FL. The t statistic was a negative value, which means there is a
significant (if $P < .05$) decrease between the two sets, which can be seen in the figures above.
Based on these graphs we can assume 1) that the population in FLorida is mainly in Miami 2) that there is
a correlation between the datasets and 3) covid had an influence on the data.

Miami vs FL House Listing Statistics using a one sample t-test.

```python
ttest_MIA_FL_Listing = stats.ttest_1samp(Housing_DF['Listings_Count'], FLhousing_df['FL_Listings_Count'].mean())
print(ttest_MIA_FL_Listing)
print()
print(f'The stats for the Average Housing Lisitings in Miami are: {Avg_Housing_DS.describe()}')
print()
print(f'The stats for the Average Housing Listings in FL are:{Avg_FLhousing_ds.describe()}')
print()
print(f'The p-value is less than the threshold ({ttest_MIA_FL_Listing[1]} < .05), so we reject the null hypothesis. \
                    There is a statistically significant relationship between the house lisitngs in miami and Florida')
```

```
TtestResult(statistic=-143.07230294752048, pvalue=3.64131216414207e-98, df=80)

The stats for the Average Housing Listings in Miami are: count        7.000000
mean      16138.876984
std        5864.328174
min        8681.833333
25%       10685.152778
50%       18985.666667
75%       21076.250000
max       21781.833333
Name: Average Listing, dtype: float64

The stats for the Average Housing Listings in FL are:count        7.000000
mean      103848.746032
std        36727.440657
min        54203.333333
25%        73738.444444
50%       110986.000000
75%       136904.208333
max       140466.583333
Name: Average_FL_Listing, dtype: float64

The p-value is less than the threshold (3.64131216414207e-98 < .05), so we reject the null hypothesis.
There is a statistically significant relationship between the house lisitngs in miami and Florida
```

Miami vs FL Housing Prices Statistics using a one sample t-test.

```python
ttest_MIA_FL_Price = stats.ttest_1samp(housPrice_df['Housing_Price'], FLhousPrice_df['FL_Housing_Prices'].mean())
print(ttest_MIA_FL_Price)
print()
print(f'The stats for the Average Housing Prices in Miami are: {Avg_housPrice_ds.describe()}')
print()
print(f'The stats for the Average Housing Prices in FL are:{Avg_FLhousPrice_ds.describe()}')
print()
print(f'The p-value is less than the threshold ({ttest_MIA_FL_Price[1]} < .05), so we reject the null hypothesis. \
                    There is a statistically significant relationship between the housing prices in miami and Florida')
```

```
TtestResult(statistic=-45085.19922429465, pvalue=5.6223423917649e-298, df=80)

The stats for the Average Housing Prices are: count      7.000000
mean      415.519841
std        81.565099
min       350.750000
25%       352.750000
50%       375.750000
75%       464.208333
max       548.222222
Name: Average_Listing, dtype: float64

The stats for the Average Housing Listings are:count        7.000000
mean      373934.555556
std        65118.224885
min       317088.333333
25%       326285.166667
50%       338565.250000
75%       420939.541667
max       467438.888889
Name: Average_FL_Housing_Prices, dtype: float64

The p-value is less than the threshold (5.6223423917649e-298 < .05), so we reject the null hypothesis.
There is a statistically significant relationship between the housing prices in miami and Florida
```

<u>Economic Indicators Review: Mortgage Interest Rates and Housing Inventory</u>

A question we were interested to answer was if there was a relationship between mortgage's interest rates are related to the count of new listings in our sample area (South Florida). Therefore, we retrieved, cleaned and aggregated data from https://fred.stlouisfed.org/ to create Line Chart II.

Line Chart II displays the monthly percentage change of Active Listing Count in West Palm Beach, Fort Lauderdale, and Miami, Florida markets in addition to the monthly percentage change in the 30-Year Fixed Mortgage Average in the United States over a seven year period.

To Answer the above question, we conducted hypothesis testing. See below Hypothesis:

H0: There is no significant relationship between mortgage rates and housing inventory.
*H1: There is a significant relationship between mortgage rates and housing inventory.*

In order to test our hypothesis, we conducted a simple linear regression test. Ultimately, we failed to reject the null hypothesis (p-value of $0.5603458276175821 >$ alpha of 0.05) ; indicating that there is a relationship between the monthly percentage change of mortgage rates and the monthly percentage change of count of house listings within our sample.

In order to measure the correlation strength of the the two variables, we used the data from Summary Statistic Table II to calculate the correlation coefficient as 0.32. Therefore, there is a weak positive correlation between the two datasets. This means that when the Percent Change of Listings is high, the Percent Change of Interest Rates is also likely to be high, and vice versa.

Using the findings from the sample, one can make some inferences about the rest of Florida's housing market. When reviewing Summary Statistics Table II, one will notice the mean and standard deviation of the Percent Change of Listings dataset are much higher than the mean and standard deviation of the Percent Change of Interest Rates dataset. This suggests that the Percent Change of Listings is more volatile than the Percent Change of Interest Rates.

Overall, the weak positive correlation between housing inventory and interest rates can have a mixed impact on both buyers and sellers. Buyers may have more choices and better negotiating power when interest rates are high, because demand is lowered but they may also have to pay more for their homes. However, higher interest rates can also make it more expensive for buyers to borrow money, which can reduce their purchasing power and make it more difficult to qualify for mortgages.

Line Chart II:

Monthly % Change of 30 YR Interest Rates vs House Listings in WPB, FLL & MIA
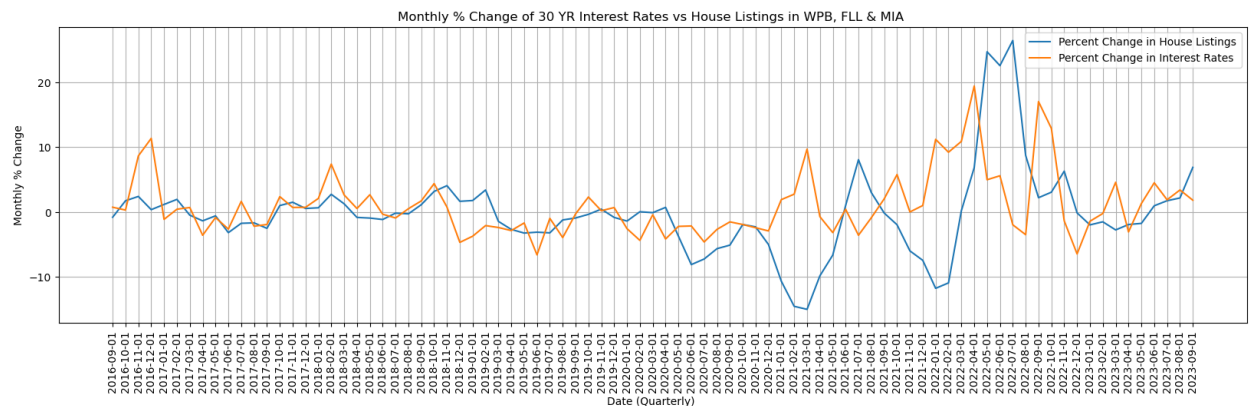
Summary Statistics Table II:

	Percent Change of New House Listings	Percent Change of Interest Rates
count	85.000000	85.000000
mean	-0.267040	0.986171
std	6.513143	4.885182
min	-15.029060	-6.618370
25%	-2.530180	-2.205420
50%	-0.496240	0.189800
75%	1.638430	2.302360
max	26.457760	19.427130

Economic Indicators Review: All Transactions Florida House Price Index

For the basket of goods analysis, we used data from a csv called The Consumer Price Index for All Urban Consumers for the state of Florida. We specifically narrowed the data to include only the years 2017 to 2023. Aggregating the data conveyed valuable insights into our home state's economic condition over time. **Reference one finding Line Chart III depicts (otherwise, why include it in the analysis?)**

When reviewing Summary Statistics Table III **Insert the table below**,

	FLSTHPI_CPIAUCSL
count	25.000000
mean	2.042192
std	0.321201
min	1.676348
25%	1.789712
50%	1.921695
75%	2.303712
max	2.594116

There is a mean value of 2.042192, which serves as a central reference point, signifying the general direction of price changes in the state, a positive change at about 2.04% increase annually. The calculated standard deviation of 0.321201, shows that there isn't music deviation from the trend, and shows that the next year's index will likely be easy to predict and will follow the same upward slope. The minimum amount of 1.676348 was the first recorded value, and the highest value being the 4th recent out of 25 points. Isolating these two values from the data set and withdrawing context may lead someone to believe that there is great variability from year to year, and that there are periods of affordability,and periods of hardship. What's important to visualize and recall is that the highest value was not an unexpected spike in cost of living, but that it exactly followed the expected curve of the data. Although for the most part, our analyzed data tells a grim story, that detail of the data gradually taking a negative slope after our maximum value gives us a glimmer of hope and shows us that cost of living is, as a matter of fact, coming down. Importantly, the 25th percentile value of 1.789712 and the 75th percentile value of 2.303712 outline the middle 50% of price changes, underscoring the main trends in consumer expenses. Overall, this data tells the story we are all feeling financially, factually. The cost of living in Florida has drastically increased.

Line Chart III:
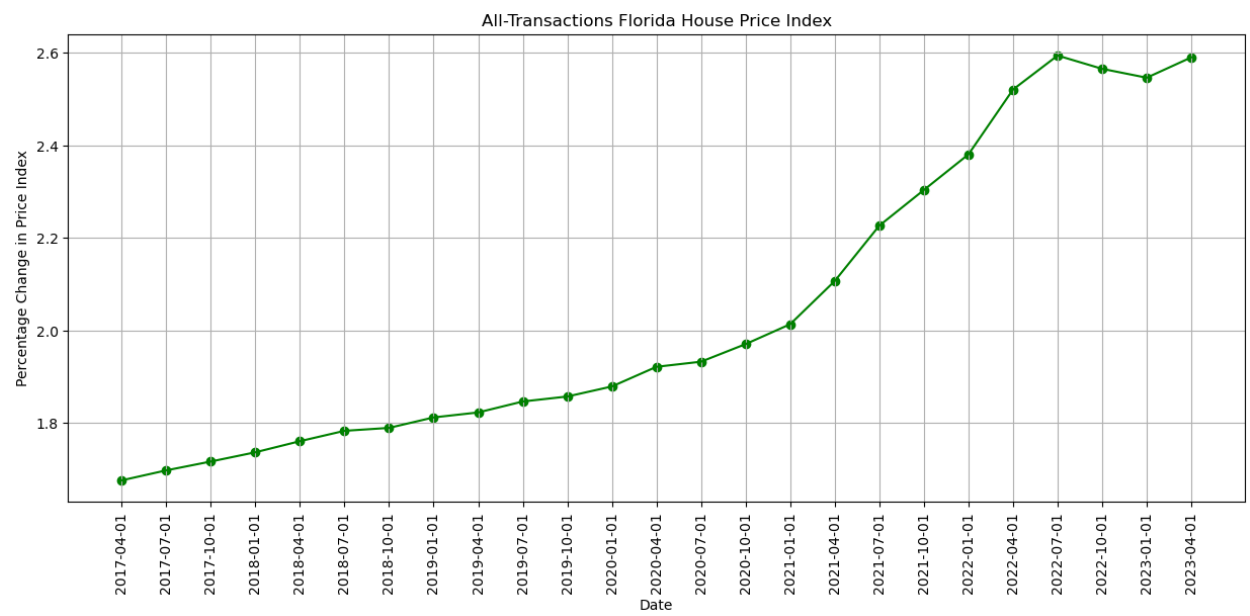
(Insert) Summary Statistics Table III

<u>Conclusion</u>

Of the Florida population, Miami makes up a majority, which is why we see a statistically significant relationship between the two. This validates our initial assumption, allowing us to make further assumptions that were tested. FCA acknowledges that there is a statistically significant relationship between house listings vs. house listing prices and mortgage rates vs. housing inventory. Though we acknowledge the limitation of the weak correlation for mortgage and housing inventory, this relationship should still be considered as a factor when analyzing why it costs so much to be alive right now. To elaborate, the purchasing power of consumers is diminished with increasing mortgage rates and decreasing housing inventory as well as the basket of good prices increasing. With the average person's most expensive cost each month being their housing expense this leaves less room to spend on wants and makes the consumer spend their money on necessities. We were able to use the All-Transactions House Price Index CPI from FRED to really hone in on how the increased cost of living is noticed in Floridian's everyday lives. The graph we created was a satisfying and appeasing way to make this data consumable to anyone.