Project 1
Milestone 2 – White Paper
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Business Problem
The housing market has become a turbulent frontier to navigate with a lot of unpredictable factors about our future, especially after the spread of a global pandemic within the last two years. People all around the globe are scouring the markets in search of their perfect home but it would be to their benefit to have a greater understanding of the housing market in their country before diving into making what will probably be one of the largest purchases of their lifetime. Datasets that contain information for the sale of houses from individual cities are all across the internet and are not difficult to analyze. However, adding a factor of foreignness from exploring international housing markets creates an intriguing outcome and understanding for the housing markets outside of the United States.

My sister moved to Australia in 2018, is now engaged to an Australian and they are currently perusing the housing market in such a questionable and uncertain current world climate. I will find a few datasets containing information on the housing market in Australia that might aid in the analyzing and exploration of that market so I could better assist my sister feel more comfortable in her house purchasing endeavors.

Background/History
Following the Australian housing market crash of 2008, 2018 began another downturn for the Australian housing market as the "national home values declined by the largest annual amount in a decade." (Lane, 2019). Melbourne and Sydney are two of the largest cities in Australia and their housing market undergoes the most assessment. The 2018 downfall saw Sydney house values fall by almost 9 percent and Melbourne house values decrease by 7 percent. The markets peaked in 2017 but since then have also been affected by the global pandemic. At the beginning of the pandemic house values declined, but soon after the economy was stimulated with billions of dollars, the housing prices saw a dramatic increase between April 2020 and February 2022. (Hutchens, 2022). Because the market has been so volatile following the events of the pandemic, I would like to assess the housing market data between the peak in 2017 and the decline in 2018 when the economy was more stable.

Data Explanation
Melbourne Housing Market
Data from this set was scraped from the weekly postings, publicly available on Domain.com.au.
Sydney Housing Market
Almost 200,000 entries of properties sold in Sydney scraped from realestate.com.au.

Methods

Data Cleaning:

Beginning with checking the data for missing values, it was found that the only variable with missing data was price. Rows with missing price values were dropped from the frame because there were enough rows to support the analysis and modeling without having to input estimated information for those houses.

Data Exploration:

Datasets were explored and analyzed utilizing visual techniques from the plotly package in Python.

Model building:

The bulk of this project was within EDA so the models were built really simply for a stats model and linear regression, just to test model building in the Melbourne housing market.

Analysis

The analysis of this data lied in creating visuals to better understand the market. House buying seasons and times of years were explored to determine whether there is a better time of year, typically to buy or sell in the Australian market, keeping in mind that seasons run opposite in Australia due to its location.

Conclusion

After visualizing the data it appears that Spring (or September through November) tends to be a busier and more expensive season than the rest. This means for sellers, Spring would be the best season to list a house, or right before the Spring season begins. As for buyers, properties were typically sold less often and for cheaper in the Summer season which runs from December to February in Australia.

As for neighborhoods, regions or suburbs, Australia is just like any other first world country. Outlying neighborhoods have different averages in prices depending on many variables related to location such as distances to certain areas. Some regions are more expensive in Melbourne, the most expensive being Eastern Metropolitan and least expensive being Southern Metropolitan.

Assumptions

It can be assumed that a lot of the housing market information and price determination in Australia can rely on a lot of the same variables that they do in other countries around the globe.

Limitations

This exploratory analysis project is being carried out with limited data from only two cities that may also have missing values. Because it is restricted to two major cities in Australia and data may not be complete, limitations exist in possible inaccurate depictions of the entire Australian

housing market. For example, what discoveries might apply to the housing markets in Sydney and Melbourne might not apply to the suburbs of Australia.

Challenges

Working with any foreign data can become a challenge as we are less familiar with international data and understanding their markets than we are with our own. When it comes to challenges like these the biggest issue would be gaining a better understanding of locations around the cities being explored and how they might impact value.

Future Uses/Additional Applications

The housing market is constantly changing whether for the worse or better so this kind of understanding of the market currently might not apply very well to the future of the market. However, the methods carried out in this project can be applied to other housing market datasets in order to gain knowledge on any housing market for which a dataset can be provided.

Recommendations

A recommendation for home buyers in Australia, more specifically Melbourne, would be to wait until the Summer season to purchase a property because the average prices of properties dropped in the hotter months of the year. As for sellers, Spring was unanimously the most expensive and most popular time of year for properties.

Implementation Plan

Implementing this project will be as simple as sharing my analysis of the market with those curious about the housing market in Australia. The model building portion of this project was for the purpose of practice rather than to set it in motion in predicting prices of various houses in the Australian housing markets.

Ethical Assessment

This project was for the purpose of gaining a better understanding of a market rather than creating some kind of promotion for a business.

References:

Hutchens, G. (2022, March 23). *Six ways the pandemic reshaped Australia's housing market*. ABC News. Retrieved April 3, 2022, from https://www.abc.net.au/news/2022-03-24/six-ways-pandemic-reshaped-australias-housing-market-corelogic/100933182#:~:text=1.,until%202024%20at%20the%20earliest
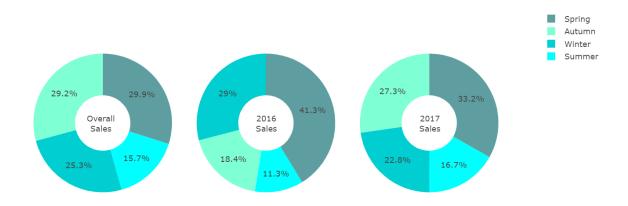
Lane, I. (2019, January 4). *2018 was the Australian Housing Market's Worst Year in a decade*. The New Daily. Retrieved April 3, 2022, from https://thenewdaily.com.au/finance/property/2019/01/02/2018-housing-downturn-australia/

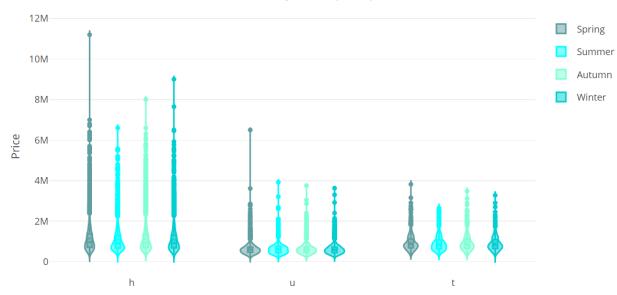# **Illustrations**

<u>Melbourne</u>
Seasonal Sales

Sales per Season

Legend: Spring, Autumn, Winter, Summer

Overall Sales: 29.9% Spring, 29.2% Autumn, 25.3% Winter, 15.7% Summer

2016 Sales: 41.3% Spring, 29% Winter, 18.4% Autumn, 11.3% Summer

2017 Sales: 33.2% Spring, 27.3% Autumn, 22.8% Winter, 16.7% Summer

Seasonal Sales and Prices

Distribution of Price by Type
Measuring Seasonality Activity
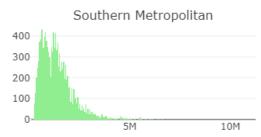

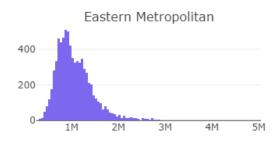Type of Property (h=house, u=unit, t=townhouse)

Regional Sales

Price Distributions by Region

Overall Price Distribution

Northern Metropolitan

Southern Metropolitan

Eastern Metropolitan

Western Metropolitan

SouthEastern Metropolitan
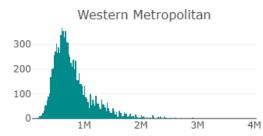

Northern Victoria
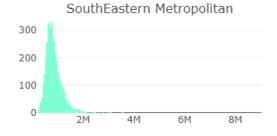

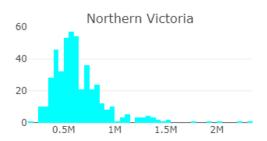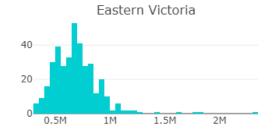
Eastern Victoria

Western Victoria

Sydney
Variable Correlation

Appendix

Photos from a housing market flier received by my sister in her neighborhood.

[1]

[2]

10 Questions Asked by an Audience

1. Because this data was pulled from the past, how can we be sure this information is accurate and can be applied to the current market?
2. What is the most valuable region or suburb to invest in within each of the cities?
3. When is the best and worst time of year to purchase a house?
4. When is the best time and worst of year to list a property for sale in the Australian housing market?
5. Is there a house buying/selling season?
6. Which property types are the most valuable?
7. What variables are the most important contributors to property value?
8. What other variables might be missing from this data that could also be contributing to property value?
9. How different is the Australian housing market when compared to the American housing market?
10. Question 10