# Project 2

## Name

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## Student number

S3959738

## Assignment URL

## <https://posit.cloud/content/6870307>

## References

1. Melbourne Housing Market. (2018, October 14). Kaggle. <https://www.kaggle.com/datasets/anthonypino/melbourne-housing-market>
2. Domain.com.au | Real Estate & Properties For Sale & Rent. (n.d.). Domain. <https://www.domain.com.au/>
3. CC BY-NC-SA 4.0 Deed | Attribution-NonCommercial-ShareAlike 4.0 International | Creative Commons. (n.d.). <https://creativecommons.org/licenses/by-nc-sa/4.0/>
4. Brian Caffo. (2016c, July 26). R Markdown slides part 2 of 6 [Video]. YouTube. <https://www.youtube.com/watch?v=Cq8gL6FSlkw>
5. Brian Caffo. (2016, July 26). R Markdown slides part 6 of 6 [Video]. YouTube. <https://www.youtube.com/watch?v=RkRFsXXvpsU>
6. rstudio. (n.d.). GitHub - rstudio/revealjs: R Markdown Format for reveal.js Presentations. GitHub. <https://github.com/rstudio/revealjs>
7. Lecture notes and Videos from Prof. James Baglin for MATH2270-Data Visualisation course.

## Assignment Code

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title: "Assignment 3: Storytelling with open data"

subtitle: "Unveiling the Melbourne Housing Market: Analyzing Buyer Preferences"

author: "Priya Ningappa Madabal (s3959738)"

date: "`r Sys.Date()`"

output: revealjs::revealjs\_presentation

transition: 'fade'

---

```{r setup, include=FALSE}

knitr::opts\_chunk$set(echo = FALSE)

```

```{r libraries, include=FALSE}

# Load the necessary packages

library(dplyr)

library(ggplot2)

library(colorspace)

library(knitr)

library(RColorBrewer)

library(lubridate)

library(revealjs)

```

## \*\*Unveiling the Melbourne Housing Market: Analyzing Buyer Preferences\*\*

### \*\*Introduction\*\*

\* The Melbourne housing market is a vibrant and diverse landscape that continually evolves, shaped by various factors that influence buyer preferences. In a dynamic real estate environment, understanding these preferences is essential for buyers, sellers, investors, and industry professionals.

\* This report is structured to provide a thorough understanding of the Melbourne housing market, with an emphasis on the factors that drive buyer preferences. Through a combination of descriptive statistics, data visualization, regression analysis, and more, we aim to shed light on the following key aspects:

1. Property Types and Preferences: Analyzing how property types such as houses, units, and townhouses influence pricing, providing insights into buyer preferences.

2. Geospatial Influences: Investigating the impact of distance from Melbourne's CBD on property desirability and pricing, emphasizing the role of location.

3. Suburban Impact: Exploring how individual suburbs affect property prices, highlighting variations in desirability and perceived value across geographic areas.

4. Market Trends Over Time: Examining the evolution of the Melbourne housing market over years, revealing seasonal trends and price fluctuations in historical data.

## \*\*About the Dataset\*\*

\* This dataset, last updated on 06/08/2018, captures the dynamics of Melbourne's housing market during a period of cooling-off. It provides valuable insights for analyzing when the slowdown occurred, potential indicators of the slowdown (e.g., price trends, property types, council areas), and the feasibility of predictions. Whether you're considering a property investment or simply curious about Melbourne's real estate landscape, this dataset offers a rich source of information to explore market trends and make informed decisions.

\* This dataset, sourced from publicly available results on Domain.com.au, provides valuable insights into the real estate market, featuring information on property types, suburbs, selling methods, room counts, prices, real estate agents, sale dates, and distances from the central business district (CBD). It serves as a rich foundation for in-depth data analysis and market trends exploration.

\* References for the Dataset:

1. Melbourne Housing Market. (2018, October 14). Kaggle. <https://www.kaggle.com/datasets/anthonypino/melbourne-housing-market>

2. Domain.com.au | Real Estate & Properties For Sale & Rent. (n.d.). Domain. <https://www.domain.com.au/>

3. CC BY-NC-SA 4.0 Deed | Attribution-NonCommercial-ShareAlike 4.0 International | Creative Commons. (n.d.). <https://creativecommons.org/licenses/by-nc-sa/4.0/>

```{r load-data, include=FALSE}

getwd()

housing\_data <- read.csv("MELBOURNE\_HOUSE\_PRICES\_LESS.csv")

#dropping rows which contains missing values in PRICE column.

housing\_data <- na.omit(housing\_data)

housing\_data

```

## \*\*1. Property Types and Preferences\*\*

```{r fig.align='center'}

# Define a color palette for property types

property\_colors <- c("house" = "#E6E6FA", "town" = "#98FB98", "unit" = "#ADD8E6")

# Create a scatter plot to visualize the relationship between Property Type and Price

ggplot(housing\_data, aes(x = Type, y = Price, fill = Type)) +

geom\_boxplot() + # You can also use geom\_point() for a scatter plot

labs(x = "Property Type", y = "Price (AUD)") +

ggtitle("Property Types and Preferences") + # Add the title here

theme(axis.text.x = element\_text( hjust = 1)) +

theme(plot.title = element\_text(hjust = 0.5, face = "bold", size = 20)) # Center and bold title

```

<center>\*\*Figure 1: Property Types and Preferences\*\*</center>

## \*\*Which Property Type has a trend in the market? \*\*

\* Houses(h) are the most preferred property type among buyers, commanding the highest mean price of approximately AUD 1,110,586.6. This suggests that houses are valued for their spaciousness, versatility, and potential for customization, making them a top choice for those seeking a long-term investment or a family home.

\* Townhouses(t) come in second place with an average price of AUD 911,148.0. Buyers favor townhouses for their combination of space and low-maintenance living.

\* Units(u) have the lowest mean price among the property types, averaging around AUD 630,105.3. These compact living spaces are appealing to individuals and smaller households seeking affordability and convenience.

## \*\*2. Geospatial Influences\*\*

```{r fig.align='center'}

# Create a scatter plot to visualize the relationship between Distance and Price

ggplot(housing\_data, aes(x = Distance, y = Price)) +

geom\_point(color = "orange") +

labs(x = "Distance from CBD (Kilometers)", y = "Price (AUD)") +

ggtitle("Geospatial Influences: Relationship Between Distance and Price") +

theme\_minimal() +

theme(

plot.title = element\_text(hjust = 0.5, size = 14, face = "bold")

)

```

<center>\*\*Figure 2: Geospatial Influences\*\*</center>

## \*\*Geospatial Trends\*\*

\* Proximity to CBD: Properties located closer to the CBD are generally more desirable because they offer greater accessibility to work, amenities, entertainment, and transportation. This high demand for central locations tends to drive up property prices.

\* Distance and Price: As you move further away from the CBD, the convenience and accessibility to city resources decrease. Buyers are typically more willing to pay a premium for properties in prime, centrally located areas. As distance increases, there is often a corresponding reduction in property prices. Buyers may prioritize more affordable options over proximity to the CBD.

## \*\*3. Suburban Impact\*\*

```{r fig.align='center'}

# Calculate the mean price for each suburb

suburb\_prices <- housing\_data %>%

group\_by(Suburb) %>%

summarize(mean\_price = mean(Price, na.rm = TRUE))

# Arrange the suburbs in descending order of mean\_price

top\_suburbs <- suburb\_prices %>%

arrange(desc(mean\_price))

# Select the top 10 suburbs

top\_10\_suburbs <- top\_suburbs %>% head(10)

# Define a color palette from RColorBrewer

color\_palette <- brewer.pal(10, "Paired")

# Create a bar plot with the defined color palette

ggplot(top\_10\_suburbs, aes(x = Suburb, y = mean\_price, fill = Suburb)) +

geom\_bar(stat = "identity") +

labs(x = "Suburb", y = "Mean Price (AUD)") +

theme(axis.text.x = element\_text(angle = 90, hjust = 1) ) +

scale\_fill\_manual(values = color\_palette) +

ggtitle("Top 10 Suburbs by Mean Property Price") +

theme(plot.title = element\_text(hjust = 0.5, face = "bold"))

```

<center>\*\*Figure 3: Suburban Impact\*\*</center>

## \*\*Top 10 Suburbs in Melbourne\*\*

\* Our analysis has unveiled the top 10 suburbs in Melbourne, each with its unique characteristics and attributes that contribute to their desirability and higher property prices.

\* Top 10 Suburbs are: Deepdene, Canterbury, Middle Park, Malvern, Brighton, Albert Park, Balwyn, Ivanhoe East, Camberwell, and Kooyong.

\* Deepdene stands out as the most prestigious suburb in Melbourne, boasting an impressive average property price of AUD 2,359,806. The suburb's allure likely lies in its combination of convenience, green spaces, and upscale amenities.

\* Canterbury follows closely, with an average property price of AUD 2,228,267. This suburb's charm may be attributed to its elegant and historic architecture, along with its proximity to Melbourne's CBD.

\* Middle Park secures the third spot on our list with an average property price of AUD 2,211,656. Its scenic location, near the bay and close to the city, makes it a sought-after destination.

## \*\*References\*\*

1. Melbourne Housing Market. (2018, October 14). Kaggle. https://www.kaggle.com/datasets/anthonypino/melbourne-housing-market

2. Domain.com.au | Real Estate & Properties For Sale & Rent. (n.d.). Domain. https://www.domain.com.au/

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2. Brian Caffo. (2016c, July 26). R Markdown slides part 2 of 6 [Video]. YouTube. https://www.youtube.com/watch?v=Cq8gL6FSlkw

3. Brian Caffo. (2016, July 26). R Markdown slides part 6 of 6 [Video]. YouTube. https://www.youtube.com/watch?v=RkRFsXXvpsU

4. rstudio. (n.d.). GitHub - rstudio/revealjs: R Markdown Format for reveal.js Presentations. GitHub. https://github.com/rstudio/revealjs

5. Lecture notes and Videos from Prof. James Baglin for MATH2270-Data Visualisation course.

```{css}

/\* Custom CSS to reduce font size in reveal.js slides \*/

.reveal p, .reveal ul, .reveal ol {

font-size: 16px;

}

.reveal h1, .reveal h2, .reveal h3, .reveal h4, .reveal h5, .reveal h6 {

font-size: 24px;

color: Navy;

}

/\* Custom CSS for title and subtitle \*/

.reveal .slides h1.title {

font-size: 36px; /\* Adjust the font size as needed \*/

font-weight: bold; /\* Make it bold \*/

color: orange;

}

.reveal .slides h2 {

font-size: 24px; /\* Adjust the font size as needed \*/

font-weight: bold; /\* Make it bold \*/

}

```