Introduction

The Australian property market comprises the trade of land and its permanent fixtures located within Australia. The average Australian property price grew 0.5% per year from 1890 to 1990 after inflation, however rose from 1990 to 2017 at a faster rate, and may be showing signs of a contracting economic bubble. House prices in Australia receive considerable attention from the media and the Reserve Bank, and some commentators have argued that there is an Australian property bubble.

The residential housing market has seen drastic changes in prices in the past few decades. The median house price in Sydney peaked at $780,000 in 2016. However, with stricter credit policy and reduced interest from foreign investors in residential property, prices have started falling in all the major cities.

You’ve been given business analytics task to help a large estate agent to improve the sale of their properties in a specific region in Australia. You’ve been provided with historical data showing details of 34,857 properties sold by this agency in the past. You were given a business analytics task to understand trends in this data and provide insights on how sales of properties could be improved.

Assignment Setup

You will work with two provided files for this exploratory case study:

1. [CSV file with property market data](https://engage.bath.ac.uk/learn/pluginfile.php/79812/mod_assign/intro/property_market_dataset.csv) which includes the following columns:

* Suburb: Suburb
* Rooms: Number of rooms
* Type:
  + br - bedroom(s);
  + h - house, cottage, villa, semi, terrace;
  + u - unit, duplex;
  + t - townhouse;
  + dev site - development site;
  + o res - other residential.
* Price: Property sale price in Australian dollars
* Method:
  + S - property sold;
  + SP - property sold prior;
  + PI - property passed in;
  + PN - sold prior not disclosed;
  + SN - sold not disclosed;
  + NB - no bid;
  + VB - vendor bid;
  + W - withdrawn prior to auction;
  + SA - sold after auction;
  + SS - sold after auction price not disclosed;
  + N/A - price or highest bid not available.
* Distance: Distance from Central Business District (CBD) in Kilometres
* Bedroom: Number of Bedrooms
* Bathroom: Number of Bathrooms
* Car: Number of car spots
* Landsize: Land Size in Metres
* BuildingArea: Building Size in Metres
* YearBuilt: Year the house was built

1. [Formatted R Assessment Notebook to download from here](https://engage.bath.ac.uk/learn/pluginfile.php/79812/mod_assign/intro/Property%20market%20R%20notebook.Rmd) to write all your descriptive answers and R code. Provide all descriptive answers directly below the code in **R Assessment Notebook**. Once you have completed all questions, make sure you tidy up **R Assessment Notebook** and knit HTML output from your entire code. Make sure all figures are labelled, and the HTML document is clear to follow.

For submission, provide:

* completed **R Assessment Notebook** with all answers
* HTML output knitted from completed **R Assessment Notebook**.

Question 1. Examine data set structure in R to identify any problems with property market data set.

1. Briefly describe data problems you’ve discovered and provide R code from your analysis in **R Assessment Notebook**.
2. Fix any problems you’ve identified with data set. Code your solution in **R Assessment Notebook**. Explain your decision why to fix those specific data problems.

Question 2. Run exploratory analysis in R on property sale dataset.

1. Explore the variable property sale price in the context of other variables in the data set using visual analytics. Use at least four different types of graphs. Briefly explain why you've selected each of those graphs for specific variables.
2. With the goal being an improvement of property sales, what are the exploratory questions you would ask about this data set? List at least three such questions, and provide answers to each of those question by coding solutions in R Assessment Notebook.

Question 3. Create a short presentation in R Assessment Notebook.

a. Write a short set of recommendations you would give to the estate agent based on your entire analysis.

b. Provide three key graphs you would share with the estate agent that best capture your results.