

■ Belmont North Property Market Analysis

Project Overview

This project analyzes real-estate property data from Belmont North, NSW, using Python, Pandas, Seaborn, Matplotlib, and Folium. The data originates from the Microburbs API sandbox and provides property listings with attributes such as price, bedrooms, bathrooms, land size, and coordinates. The goal is to clean and normalize nested JSON data, perform exploratory data analysis (EDA), visualize patterns, and build an interactive property map to visualize real locations and prices.

Project Workflow (Step-by-Step Explanation)

- 1■■ Importing Libraries: pandas, numpy, seaborn, matplotlib, and json for data manipulation and visualization.
- 2■■ Loading and Normalizing Data: Used `pd.json_normalize()` to flatten nested JSON into a tabular DataFrame.
- 3■■ Renaming Columns: Simplified nested keys like `address.street` → `street` for easier handling.
- 4■■ Data Cleaning: Removed text from `land_size` (e.g., 'm²'), converted types, and handled missing values.
- 5■■ Basic Overview: Computed total listings, mean and median prices, and property type distribution.
- 6■■ Statistical Summary: Used `df.describe()` to obtain averages and standard deviations for numerical data.
- 7■■ Visual Analysis (EDA): Created histograms, scatter plots, and regression plots to explore relationships between price, bedrooms, and land size.
- 8■■ Correlation Heatmap: Visualized relationships between numerical variables (price, `land_size`, bedrooms, etc.)
- 9■■ Time-Series Visualization: Tracked `listing_date` vs price to observe trends.
- ■ Interactive Mapping: Used Folium to create an HTML map with clickable property markers showing key info.

Summary of Insights

- Average property price: \$1.23 million; median price: \$1.15 million.
- Composition: 7 Houses (78%) and 2 Units (22%).
- Average land size: 763 m² with typical 3–4 bedroom homes.
- Price drivers: Bedrooms and bathrooms strongly correlate with price.
- Market range: \$575,000 – \$1,800,000, showing both entry-level and luxury properties.
- Neighborhood profile: Family-oriented, mid-upper segment, stable property values.

Technology Stack

- Python 3
- Pandas
- NumPy
- Matplotlib
- Seaborn
- Folium
- Jupyter Notebook

Dependencies

To install required dependencies, run:

pip install -r requirements.txt

How to Run the Project

- 1. Clone the repository and open it in VS Code or Jupyter Notebook.
- 2. Place `belmont_properties.json` in the project directory.
- 3. Run all notebook cells in order.
- 4. Generated outputs include visual charts and `belmont_map.html` interactive map.

End of Report

This project provides a complete analytical view of the Belmont North property market, highlighting key pricing patterns, housing distribution, and visual mapping insights.