Smarter Housing Choices
Technical Report

1. Introduction:

The real estate market in Bahrain plays a crucial role in supporting national housing and economic development. However, property seekers often struggle to make informed choices due to limited transparency in listings and significant variations in prices across areas and property types.

This project, *Smarter Housing Choices*, aims to bridge that information gap by analyzing the Bahraini property market through data analytics. Using web scraping, data preprocessing, and visualization, the study compares rent and sale properties across governorates, highlighting affordability levels and trends that affect families' housing decisions.

2. Problem Statement

For many property seekers in Bahrain, finding a suitable home is stressful and uncertain. Prices vary widely, listings are inconsistent, and it's difficult to compare governorates or assess affordability. As a result, people often overpay for properties above market value, choose unsuitable locations, or delay decision-making due to lack of clarity.

3. Goal

The main goal of this project is to help families make confident, informed housing decisions by visualizing and interpreting real estate market data in Bahrain.

4. Audience
- Renters: Families seeking affordable homes under 500 BHD/month.
- Buyers: Families looking for homes priced below 150,000 BHD.

5. Data Collection (Web Scraping)

The dataset used in this analysis was collected from Property Finder Bahrain and provides a comprehensive view of the real estate market across the kingdom. It covers a total of 21,558 property listings, consisting of 14,100 rental properties and 7,458 properties for sale. The data spans five governorates—Capital, Muharraq, Northern, Central, and Southern—across 146 distinct areas. All listings were collected on 29 September 2025, ensuring that the analysis reflects the most recent market conditions at the time of collection.

6. Data Cleaning Process

The raw property listings dataset collected from **Property Finder Bahrain** contained several inconsistencies and non-standard formats. To prepare the data for analysis in Power BI and Python, the following cleaning steps were performed:

Price standardization

- **Buy**: Removed "BHD", removed thousand separators (,), trimmed whitespace, converted Price to numeric.

- **Rent**: Removed "BHD" and "/month", removed commas, trimmed whitespace, converted Price to numeric.

Property ID reindexing (to avoid collisions)

The number of records in the rent dataset was counted, and the property IDs in the sale dataset were adjusted so that each property across both datasets has a unique identifier.

Combining datasets

- Concatenated buy and rent into a single combined Dataframe for unified processing and downstream analysis.

Bedrooms normalization (Beds)

- Standardized mixed formats (e.g., "studio", "3+ Maid", "7++ Maid"):

  o Treated "studio" as **1** bedroom.

o Extracted the first number if present; if "maid" appears, **added +1**.

o Wrote the cleaned result to combined["Beds"] as a nullable integer.

Bathrooms cleanup (Baths)

- Inspected unique values and "none" cases.

- Imputed "none" → "0" for **Land** and **Compound**; "none" → "1" for **Apartment**.

- Replaced any remaining "none" with empty string, leaving genuine blanks were unknown.

Geography quality

- Dropped rows with missing Governorate to ensure consistent geographic aggregation.(only 3 rows)

Property size parsing (Size → Size_sqft, Size_sqm)

- Extracted numeric values from strings like "4,306 sqft / 400 sqm" into **two numeric columns**:

  o Size_sqft (floats) and Size_sqm (floats), after removing commas.

- Dropped the original mixed Size column.

Utilities inclusion flag (Include_w_e)

- Mapped "Exclusive" → **0**, "Inclusive" → **1**, simplifying later comparisons (e.g., utilities vs. no utilities).

7. Data Dictionary

- **Property_id (Integer):** Unique identifier assigned to each property listing.
- **Offer (Text):** Type of offer — indicates whether the property is for *Rent* or *Buy (Sale)*.
- **URL (Text):** Direct webpage link to the property listing on Property Finder Bahrain.
- **Property_type (Text):** Category of the property (e.g., *Apartment*, *Villa*, *Land*, *Studio*, *Whole Building*).
- **Price (Integer):** Property price in Bahraini Dinar (BHD). For rental listings, this represents the monthly rent.

- **Include_w_e (Integer/Binary):** Indicates whether the price includes water and electricity charges (1 = Included, 0 = Not included).
- **Title (Text):** The headline or title used by the listing agent to describe the property.
- **Area (Text):** The neighborhood or district where the property is located.
- **Governorate (Text):** The governorate of Bahrain in which the property is located (*Capital, Muharraq, Northern, Central, Southern*).
- **Beds (Integer):** Number of bedrooms in the property.
- **Baths (Integer):** Number of bathrooms in the property.
- **Availability_date (Date/Text):** The date when the property is available or listed for sale/rent.
- **Agent_name (Text):** The name of the real estate agent handling the listing.
- **Agency (Text):** The name of the real estate company or agency responsible for the listing.
- **Amenities (Float):** Number of listed amenities (e.g., gym, pool, parking).
- **Size_sqft (Integer):** Property size measured in square feet.
- **Size_sqm (Integer):** Property size measured in square meters.

8. Findings Summary

Rental Market

- Capital Governorate dominates Bahrain's rental listings, while Central and Southern show limited options.

- Apartments make up most rental properties, with few villas available.

- Northern Governorate has the highest rents, while Central is the most affordable.

- Larger homes cost nearly four times more than smaller units.

- Central Governorate offers the best value for renters seeking affordable homes with good amenities.

Sale Market

- Most sale listings are concentrated in Capital and Muharraq governorates.

- Southern Governorate shows the highest sale prices, exceeding the market median.

- Apartments are the most affordable, while villas and lands dominate higher price brackets.

- Price increases sharply with each additional bedroom.

- Central Governorate again provides the best value overall, with balanced prices and amenities.

9. Conclusion

The analysis provides a clear, data-driven view of Bahrain's real estate market as of September 2025. The rental market is heavily concentrated in the Capital, limiting diversity in other areas. The sale market offers more property types, enabling better comparison and investment opportunities. Families with limited budgets can find the best affordability and value in Central Governorate, while those seeking convenience may prefer Capital or Muharraq.

10. Recommendations

A. Rental Market

1. Small Families — Economy Budget (< 250 BHD)

- Look for apartments in the Central or Southern Governorates, where rental prices are lowest.
- Choose compact 1–2 bedroom units with essential amenities to reduce costs.

2. Small Families — Mid-Range Budget (< 500 BHD)

- Consider apartments in the Capital or Muharraq Governorates offering higher-end amenities.
- Mid-range budgets open access to well-furnished modern units.

3. Large Families — Economy Budget (< 250 BHD)

- Target Central and Southern Governorates, where larger yet affordable villas or ground-floor flats are available.
- These locations provide more living space at a lower cost compared to urban centers.

4. Large Families — Mid-Range Budget (< 500 BHD)

- Explore Northern and Capital Governorates for properties that balance space, amenities, and convenience.
- Suitable options include 3–4-bedroom apartments or villas with family-friendly facilities.

B. Sale Market

1. Small Families — Economy Budget (< 80,000 BHD)

- Focus on apartments in the Central Governorate, which offer the most affordable purchase prices.

2. Small Families — Mid-Range Budget (< 150,000 BHD)

- Consider 2–3 bedroom apartments in Muharraq or Central Governorates.

- These regions offer a good mix of affordability, and proximity to major facilities.

- Suitable for small families planning to upgrade from renting to ownership.

3. Large Families — Economy Budget (< 80,000 BHD)

- Look for larger apartments or small villas in Central or Northern Governorates.

- These areas provide sufficient space while staying within an economy-level purchase range.

4. Large Families — Mid-Range Budget (< 150,000 BHD)

- Villas in Central or Northern Governorates provide the best balance between size and cost.

- Families can secure long-term investment in growing residential zones.

- These regions combine space, convenience, and moderate pricing, making them ideal for family ownership.