

Dubai House Price Dashboard

— Power BI Project

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Introduction

This report presents an analysis of a real estate dataset encompassing property listings in Dubai across various neighbourhoods. The dataset includes key features such as **SquareFeet**, **Bedrooms**, **Bathrooms**, **Neighbourhood**, **YearBuilt**, and **Price**. These features provide insights into property characteristics, spatial distributions, and market trends.

Business Objective

The primary objective of this analysis is to understand the factors influencing property prices and to identify key market trends. The goal is to assist buyers in making informed decisions based on a comprehensive understanding of property valuations and neighbourhood dynamics.

Data Preprocessing

The dataset was initially cleaned to ensure accuracy and consistency using **Python**. During this process, **no missing values or duplicates were found**, indicating the dataset's completeness. Several entries exhibited **negative values in the 'Price' column**, which are not realistic for property prices. These values were converted to their positive counterparts using the absolute value function to ensure accurate representation. In addition to this, analysis revealed several property listings with **abnormally low-price values**. It was determined that these values resulted from misplaced decimal points. A threshold of 100000 was set, and the values that went below were verified. Even when the property was large square feet, with more than 2 bedrooms, and located in urban areas, the price seemed really low and impractical. To address this, prices less than 10000.0000 were corrected by automatically shifting the decimal place so that there are five digits before it.

```
# Function to shift the decimal to have 5 digits before it
def correct_decimal(price):
    if price == 0: # Avoid issues with zero values
        return 0
    order = np.floor(np.log10(price)) # Find the order of magnitude of the price
    if order < 5: # Less than 6 digits before decimal
        shift = 5 - order # Calculate how many places to shift
        price *= (10 ** shift) # Multiply to shift the decimal
    return price

# Apply the correction to the selected rows
data.loc[below_threshold_rows, 'Price'] = data.loc[below_threshold_rows, 'Price'].apply(correct_decimal)
```

Additionally, three analytical columns were created to enrich the data: **price_per_sqft**, **property_age**, **listing_category**. These columns facilitate deeper analysis of property pricing patterns and market segmentation.

```

# 1. price_per_sqft
data['price_per_sqft'] = data['Price'] / data['SquareFeet']

# 2. property_age
current_year = 2025
data['property_age'] = current_year - data['YearBuilt']

# 3. listing_category based on Price quantiles
quantiles = data['Price'].quantile([0.33, 0.66])

def categorize_price(price):
    if price <= quantiles[0.33]:
        return 'Budget'
    elif price <= quantiles[0.66]:
        return 'Mid-Range'
    else:
        return 'High-End'

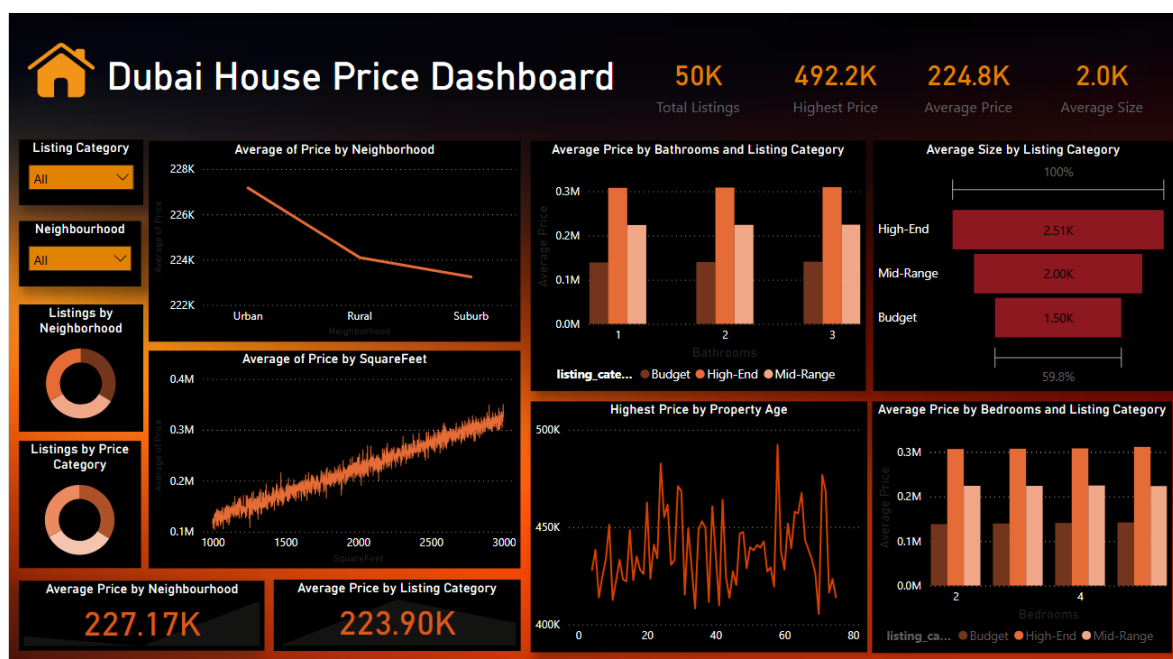
data['listing_category'] = data['Price'].apply(categorize_price)

# Display the first few rows to verify
print(data.head())

```

Dashboard Creation with Power BI

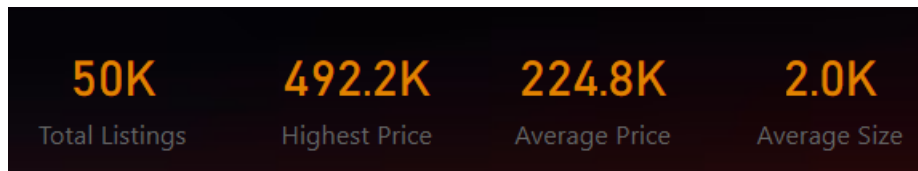
The processed CSV data served as the foundation for building an interactive Power BI dashboard. By importing the cleaned dataset, various visualizations were developed to highlight key metrics, understand distribution patterns, and location-based insights. The dashboard includes KPI cards for quick reference, bar and line charts for comparison and trend analysis, as well as slicers for dynamic filtering. This interactive setup allows stakeholders to explore the data from multiple perspectives, supporting data-driven decision-making. Below is the created dashboard:



Detailed Insights and Visualization Descriptions

1. Key Performance Indicators (KPI Cards):

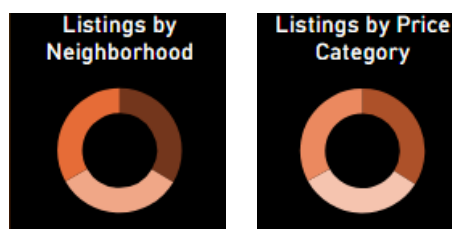
- **Total Listings (50K):** The dashboard presents a comprehensive dataset with a total of 50,000 property listings.
- **Highest Price (492.2K):** Within the dataset, the most expensive property is listed at 492,200. This figure serves as a reference point for understanding the upper points of the market and highlights the potential for high-value properties.
- **Average Price (224.8K):** The average property price across all listings is calculated at 224,800. This metric provides a central tendency for property valuations and helps set a benchmark for typical market prices.
- **Average Size (2.0K):** Properties in the dataset average a size of 2,000 square feet. This metric gives an indication of the typical living space available in the market.



Together, these KPI cards offer an immediate overview of the scale, price range, and average attributes of the property listings under analysis.

2. Listings by Neighbourhood (Donut Chart) and Price Category (Donut Chart):

The donut charts present the property distribution over the neighbourhood and the price categories. The donut charts show that the distribution of data is fairly the same in all categories indicating a well-balanced dataset.



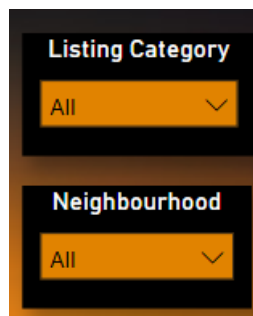
3. Average Price by Neighbourhood (Card) and Listing Category (Card):

The cards present the average price for the chosen neighbourhood and the listing category. A better neighbourhood tends to increase the price. These cards show a benchmark to the users to understand and plan their budget in a better way.



4. Dynamic Slicers:

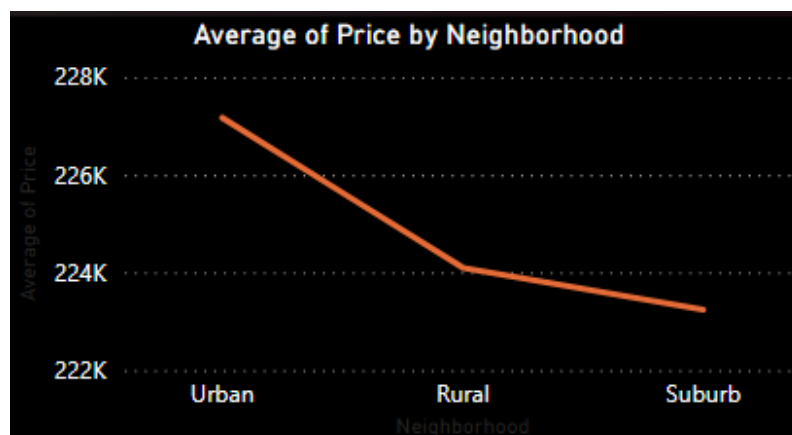
- **Listing Category:** The **Listing Category** slicer segments the dataset into price-based categories ("Budget", "Mid-Range", "High-End"), enabling users to filter and compare market segments based on property value tiers.
- **Neighborhood:** The **Neighborhood** slicer allows users to narrow the scope to specific locations – "Urban", "Suburb", "Rural", facilitating targeted analysis of market dynamics within particular areas.



By using these slicers, stakeholders can focus their analysis on particular segments or geographic areas, making the dashboard highly adaptable.

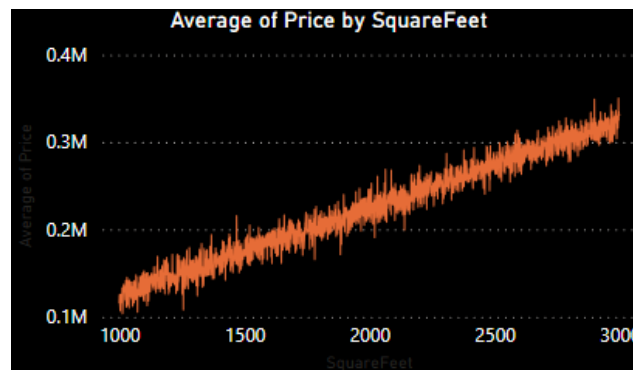
5. Average Price by Neighbourhood (Line Chart):

This line chart visualizes the average property price in relation to different neighbourhoods (Urban, Rural, Suburb). The line chart indicates the price decreases from Urban area to Suburb area. Urban areas are expensive probably due to immediate facilities available in the neighbourhood.



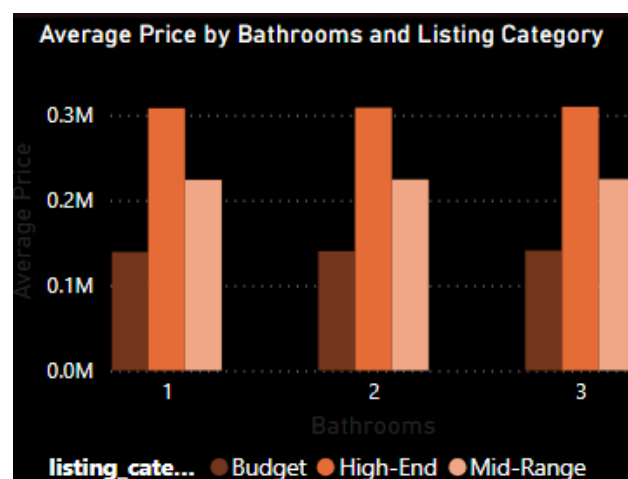
6. Average Price by Square Feet (Line Chart):

The visualization is a line chart that illustrates the price corresponding to the square feet. As the square feet increases from 100 to 3000, there is increase in price from 0.2M to 0.4M. There's a clear, strong positive correlation between Square Footage and Price. This helps prospective buyers set expectations based on size preferences, while sellers can leverage this information to understand the potential value of larger properties.



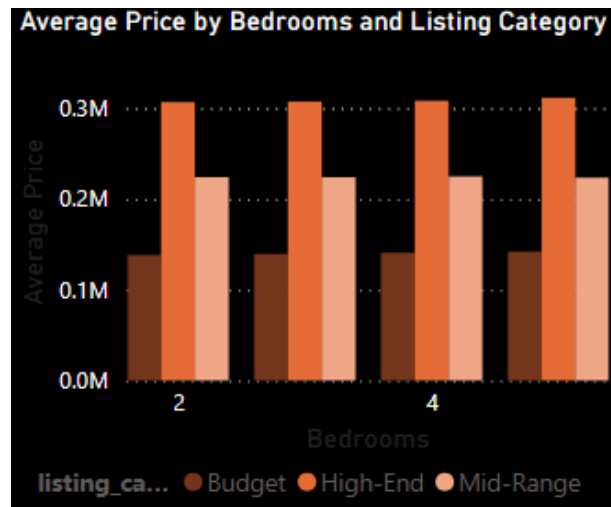
7. Average Price by Bathrooms and Listing Category (Column Chart):

This chart explores the relationship between the average property price, the number of bathrooms, and the listing category. Overall, there is a positive correlation between number of bathrooms and listing prices. While there is a general trend of slightly increased average price with more bathrooms, the magnitude of the increase is relatively small (approximately 1000).



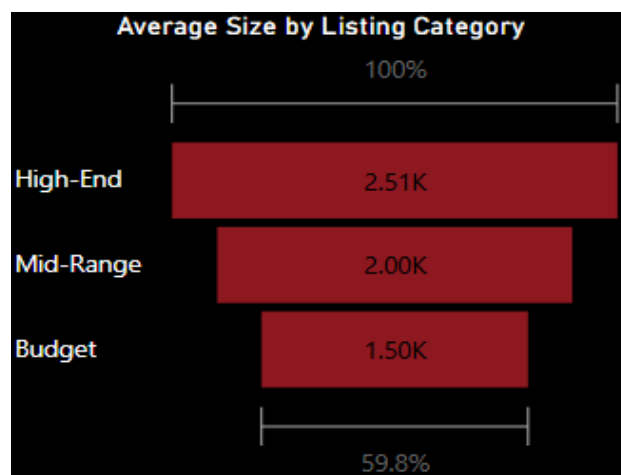
8. Average Price by Bedrooms and Listing Category (Column Chart):

The graph shows the average price with the number of bedrooms. The chart reveals the average price is high for 4 bedrooms for the categories - Budget, High-End and Mid-Range. Higher the number of bedrooms, high is the listing price (about 1000 more), similar to number of bathrooms.



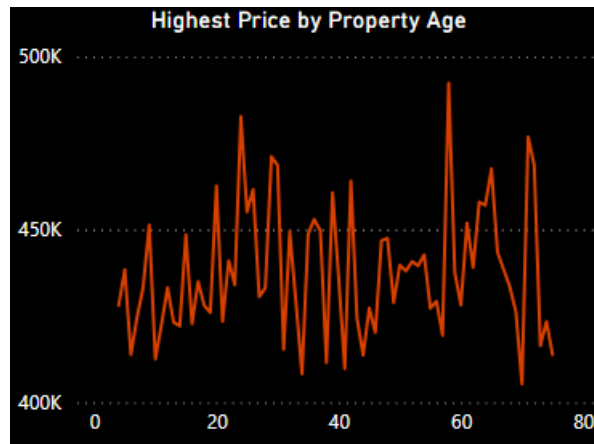
9. Average Size by Listing Category (Funnel Chart):

In the funnel chart, the properties are categorized based on the size and compared with the listing categories. Larger the property, higher is the price. Properties categorized as "High-End" generally have the largest average square footage compared to "Mid-Range" and "Budget" categories. High End listing category houses are highest in size (2.51K). This chart can guide property developers in understanding the expected sizes for premium listings and help buyers set realistic expectations based on their budget.



10. Highest Price by Property Age (Line Chart):

The visualization presents the trend of the highest property price across the age. The property listing can fluctuate a lot depending on the age. This shows that age alone can't be the deciding factor. The size of the property, the location, the neighbourhood, number of rooms, etc. contribute to it. The recent ones are less pricy in the line chart, mostly because they are smaller in size compared to the old properties.



Main Insights and Business Suggestions

Price Sensitivity to Size: Square footage is a dominant factor influencing property prices. Larger properties command significantly higher prices. Developers should consider designing larger units to cater to buyers willing to invest in spacious living.

Neighbourhood Matters: Location significantly impacts average property prices. Urban areas tend to have higher prices compared to suburban and rural locations. Investors should focus on properties in urban neighbourhoods for potentially higher returns, while buyers on a budget might find better deals in suburban or rural areas.

Number of Bedrooms Impact Price: The listing price increases with the number of bedrooms and bathrooms. While the change is similar with both, the high-end listing category tends to have an impact on number of bathrooms. Sellers should consider renovating to add extra bathrooms to their property.

Balanced Data Distribution: The donut charts reveal a fairly balanced dataset distribution across neighbourhoods and price categories. Further analysis could explore the specific characteristics of these neighbourhoods and price segments to uncover niche market opportunities.

Conclusion

This Power BI dashboard and associated analysis provide a comprehensive overview of the Dubai real estate market, revealing key insights into property valuations, location dynamics, and market trends. By understanding the factors that influence property prices, stakeholders can make informed decisions, optimize their investment strategies, and capitalize on emerging opportunities in this dynamic market.