

# **PROJECT REPORT**

## **REAL ESTATE HOUSING DATA ANALYSIS**

### **Overview:**

This report outlines a comprehensive exploratory data analysis conducted on a dataset of **real estate properties**. The analysis aimed to uncover the key factors influencing property values, using various statistical techniques and visualizations.

**Data Description:** The dataset comprised multiple features related to properties, including 'Total Value', 'Size', 'Number of Floors', 'Facing', 'Setback', 'Basement Presence', and 'Real Estate Condition'. Each attribute was analyzed to determine its impact on the overall property value.

### **Techniques and Tools Used:**

- **Statistical Analysis:** Basic statistical measures like mean, median, and mode were calculated to understand the distribution and central tendencies of the data.
- **Visualization:** Various plots such as histograms, box plots, and scatter plots were utilized to visually assess relationships and distributions. These visualizations were facilitated by Python libraries, including Matplotlib and Seaborn
- **Correlation Analysis:** Correlation coefficients were computed to understand the strength and direction of relationships between 'Total Value' and other numerical features.
- **Regression Analysis:** Coefficients from this analysis tell us the expected increase in property value for one unit increase in a feature, holding other features constant

## *Key Findings from the Analysis*

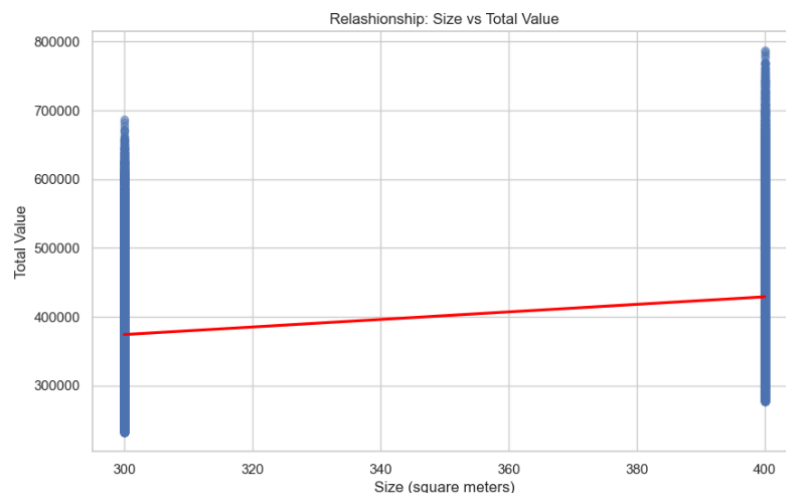
### 1. Land Value:

Land value is a primary driver of property value. From the scatter plot analysis, it is evident that land value correlates strongly with total property value. Specifically:

- **Statistical Insights:** Every **additional KWD** increase in land value **increases** the property value by about **0.996** KWD.
- **Average Land Value:** The mean land value of the properties is approximately **234,000** currency units.

### 2. Property Size:

- **300 Square Meters:** Approximately **137.74** less valuable compared to the mean property size of 338 square meters.
- **400 Square Meters:** Approximately **224.06** KD more valuable compared to the mean property size of 338 square meters.

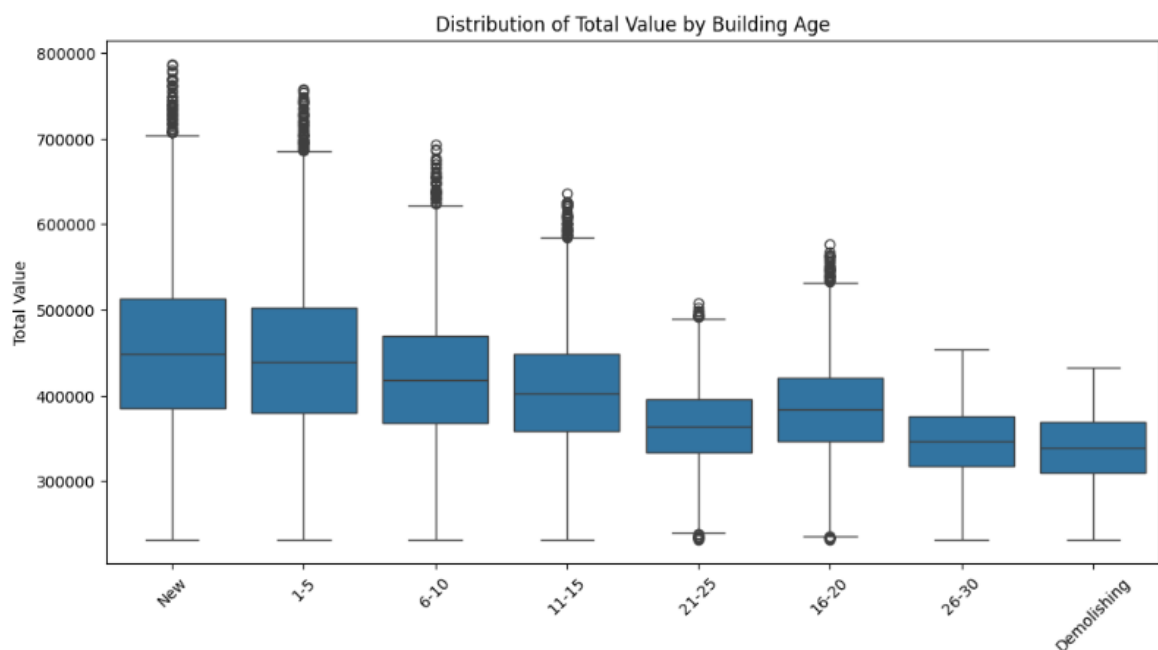


### 3. Building Value:

Building age plays a role in determining property value. Different age categories show varying impacts:

- **New:** Increases value by about **105.53** KWD.
  - **6 - 10 Years:** Decreases value by about **322.87** KWD.
  - **11 - 15 Years:** Decreases value by about **561.18** KWD.
  - **16 - 20 Years:** Decreases value by about **850.28** KWD.
  - **21 - 25 Years:** Decreases value by about **1213.78** KWD.
  - **26 - 30 Years:** Decreases value by about **1504.70** KWD.
- Demolishing:** Decreases value by about **1486.26** KWD.

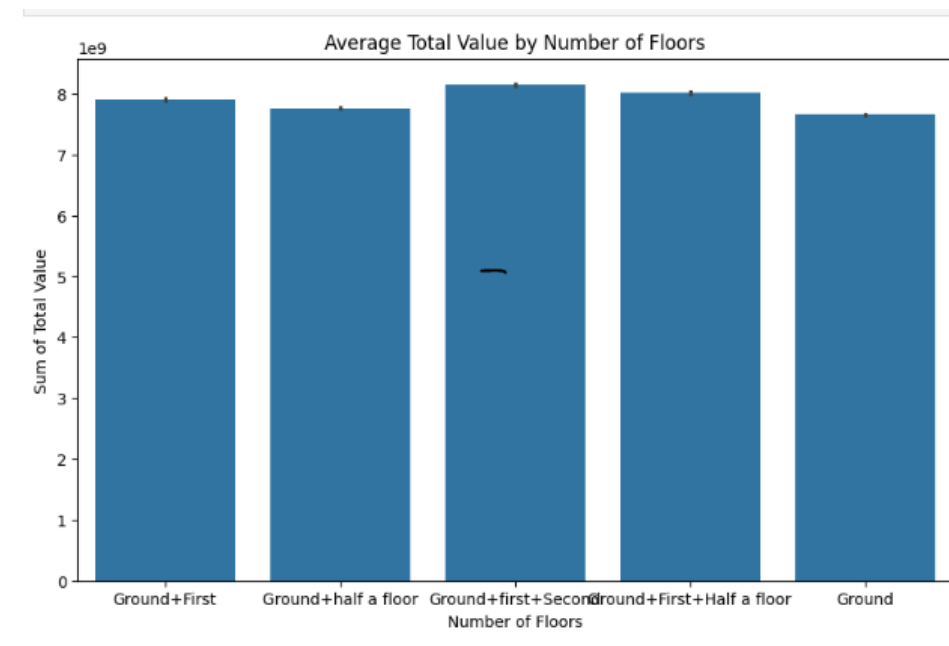
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### 4. Number of Floors:

The number of floors in a property affects its value significantly. Analysis reveals:

- **1 Floor (Ground):** Properties with only one floor have an average value of **405,000**
- **Ground + Half a floor:** **Decreases** by about **136.92** KWD compared to ground only.
- **2 Floors (Ground + First):** **Adds** about **181.99** KWD.
- **Ground + First + Half a floor:** **Adds** about **426.80** KWD.
- **3 Floors (Ground + First + Second):** **Adds** about **643.91** KWD. Properties with three floors have the highest average values, around **424,000** KWD
- **Percentage Impact:** Each additional floor configuration increases property value by an average of **3-5%**.



## 5. Basement Presence:

The presence of a basement also impacts property value:

- **Properties with a basement** are valued about **353.56** KWD higher than properties without basements. These properties have an average value of approximately **409,000**
- **Properties without Basements:** These properties average around **395,000**
- **Percentage Difference:** Properties with basements are valued about **3% higher than those without.**

## 6. Total Value by Facing Direction

The direction a property slightly affect its market value:

- **North Facing:** Increases property value by approximately **107.66** KWD.
- **South Facing:** Decreases property value by about **18.84** KWD.
- **West Facing:** Decreases property value by about **7.53** KWD.

## 7. Setback (distance from property to the street):

- **Less than 3 meters:** Decreases value by about **381.54** KWD.
- **3 - 5 Meters:** Decreases value by about **129.07** KWD.
- **6 - 9 Meters:** Decreases value by about **28.79** KWD.
- **15 - 20 Meters:** Decreases value by about **132.67** KWD.
- **21 - 30 Meters:** Decreases value by about **133.30** KWD.
- **31 - 40 Meters:** Decreases value by about **162.85** KWD.
- **41 - 50 Meters:** Decreases value by about **266.96** KWD.
- **More than 50 meters:** Decreases value by about **396.15** KWD.

## 8.Street Type

The type of street the property is located on influences its value:

**Main Internal Streets:** Increase property value by approximately **420**KWD.

- **Internal Streets:** **Adds** Average value around **399** KWD.
- **Public Highways:** **Decrease** property value by about **26.21** KWD.
- **Main Internal Streets:** **Increase** by **76.80** KWD.
- **Public - between two areas:** **Increase** by about **159.77** KWD.
- **Internal Clearance:** **Increase** by about **70.38** KWD.

## Most Expensive and Cheapest Houses:

### Most Expensive Houses:

#### Number of Floors:

**Three Floors:** Average value is approximately 420,000.

**One Floor:** Average value is approximately 378,000.

**Increase:** **42,000**

#### Basement Presence:

Properties with basements are more valuable. For example:

- **With Basement:** Average value is 405,000.

- **Without Basement:** Average value is 395,000.

**Increase:** 10,000

#### **Setback:**

Properties with a setback of 41-50 meters have an average value of 408,277. Setbacks less than 3 meters have an average value of 362,514.

**Increase:** 45,763

#### **Street Type:**

Properties on main internal streets average around 420,000. Properties on internal streets have an average value of 378,000.

**Increase:** 42,000

### **Cheapest Houses:**

#### **Number of Floors:**

Properties with only one floor have the lowest values. For example:

- **One Floor:** Average value is approximately 378,000.
- **Three Floors:** Average value is approximately 420,000.

**Decrease:** 42,000

#### **Basement Presence:**

Properties without basements have an average value of 395,000 compared to 405,000 for properties with basements.

**Decrease:** 10,000

#### **Setback:**

Setbacks less than 3 meters are associated with lower property values. For example:

- **Less than 3 meters:** Average value is 62,514.
- **41-50 meters:** Average value is 408,277.

**Decrease:** 45,763

#### **Street Type:**

Properties on internal streets tend to have lower values. For example:

- **Internal Streets:** Average value is 378,000.
- **Main Internal Streets:** Average value is 420,000.

**Decrease: 42,000**