

By GROUP 4

Property RENTAL PRICING

surrounding Kuala Lumpur and Selangor Region

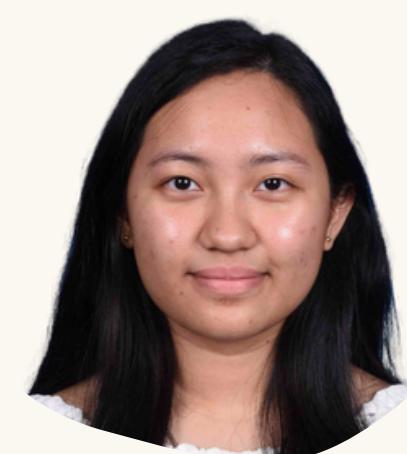
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Team Members



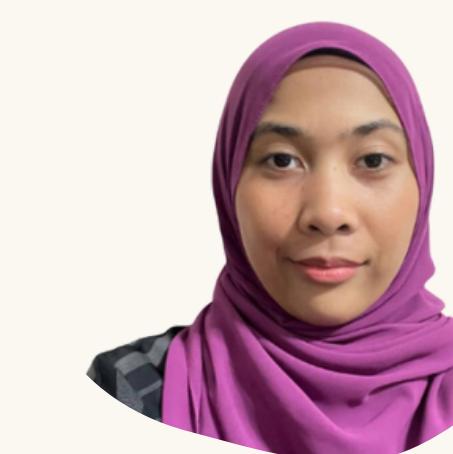
Nadiah Humaira
2023149175



Siti Jessmin
2023185023



Aisyah Syakirah
2023385555



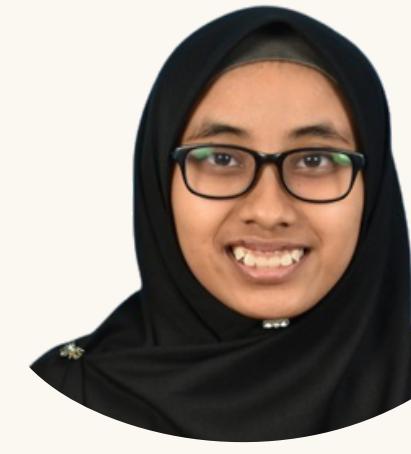
Siti Munirah
2023189821



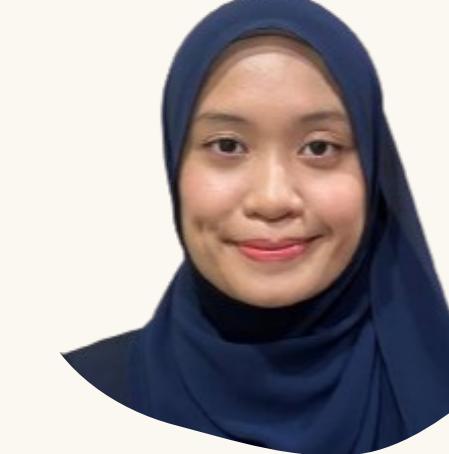
Nor Tasnim Amani
2023387791



Nur Fatihah
2023388493



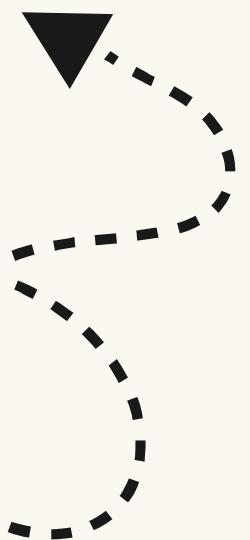
Nurul Syazwina Syahirah
2023168543



Aisyah Afiqah
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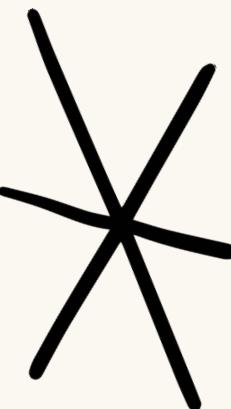
Intan Maisarah
2023388981



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1. Introduction
2. Literature Review
3. Methodology
4. Design and Development
5. Analysis and Findings

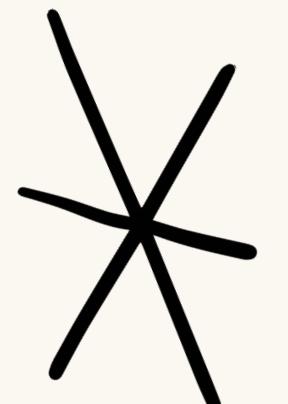
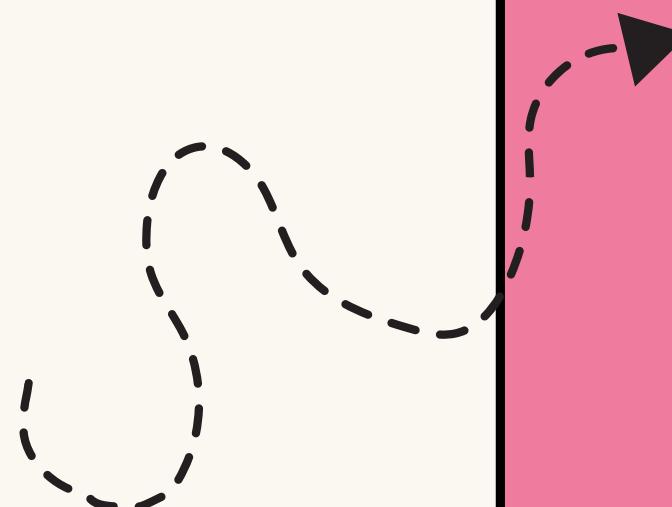
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Introduction

- 1.1 Introduction**
- 1.2 Problem Statement**
- 1.3 Project Aim**
- 1.4 Objectives**
- 1.5 Scope**
- 1.6 Significance**



INTRODUCTION



- Housing is often the biggest financial transaction for most individuals, shaping long-term financial plans.
- Housing purchase options: cash purchase, mortgage, rent-to-purchase agreements.
- Cost of rental in rent-to-purchase agreements: difference between periodic payments and the cash price of the property.
- High property prices escalate rental costs, especially in areas with better amenities and infrastructure.
- Many residents face unaffordability, stuck in a rental cycle without ownership prospects.
- Surging rental prices highlight a growing affordability gap in high-demand regions.

DID YOU KNOW?



KL has the most expensive property market in Malaysia with an average subsale house price: RM801,557 whereas an average new house price: RM708,462 (NST, 2024).

PROBLEM STATEMENT

Housing Affordability

Due to high costs, little market awareness, and a lack of financial transparency tenants

This leads to poor decisions like overspending or selecting unsuitable properties

Income vs. Housing Costs

Household income growth lags behind the sharp rise in property prices.

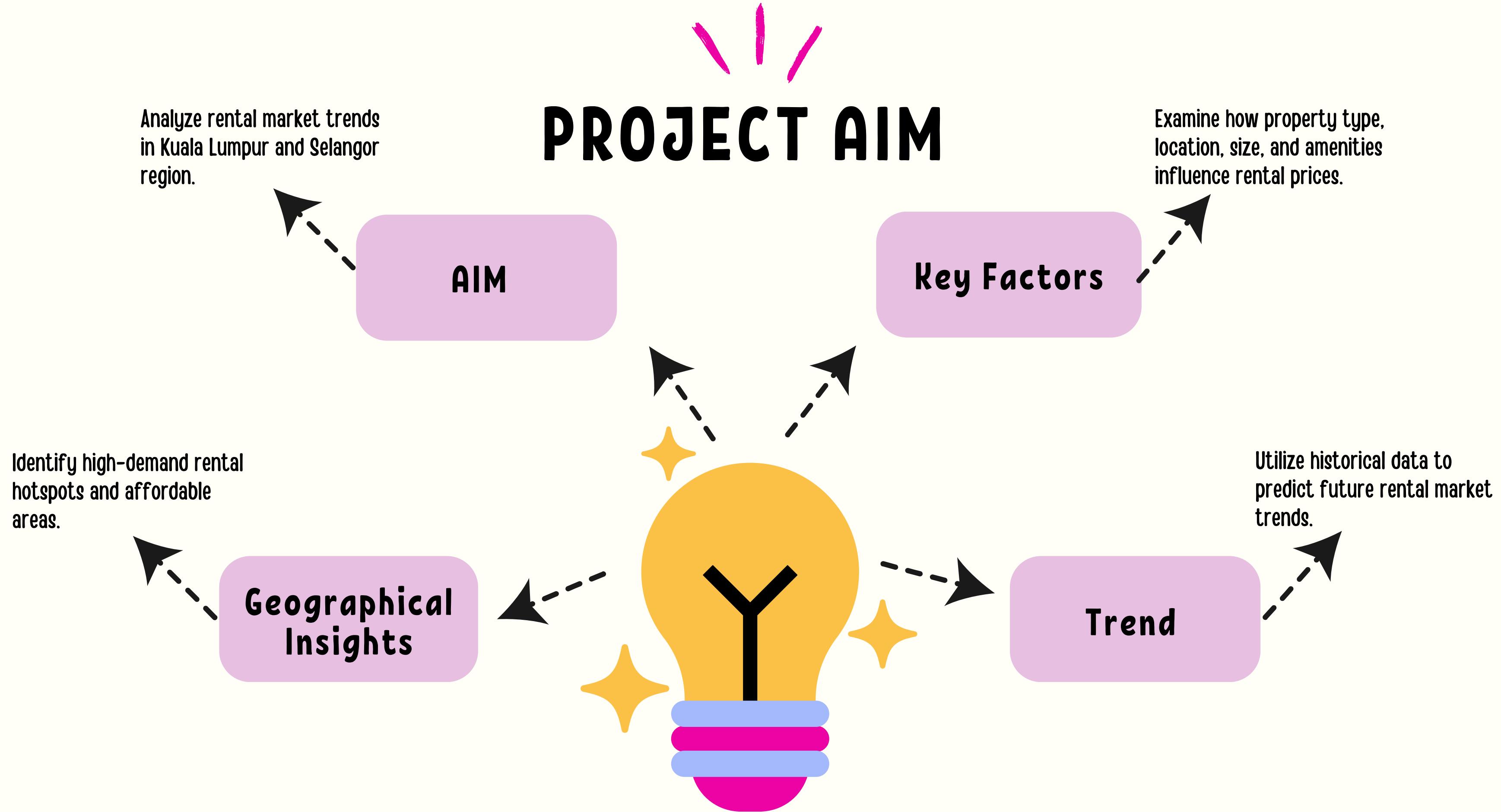
Widening affordability gap limits access to quality housing and contributes to economic inequality.

Real Estate Market Practices

Some real estate agents inflate rental prices for profit.

Results in consumers overpaying and discouraging prospective buyers from entering the market.

PROJECT AIM





OBJECTIVES

OBJECTIVES 1

To collect data on rent pricing in Kuala Lumpur and Selangor region

OBJECTIVES 2

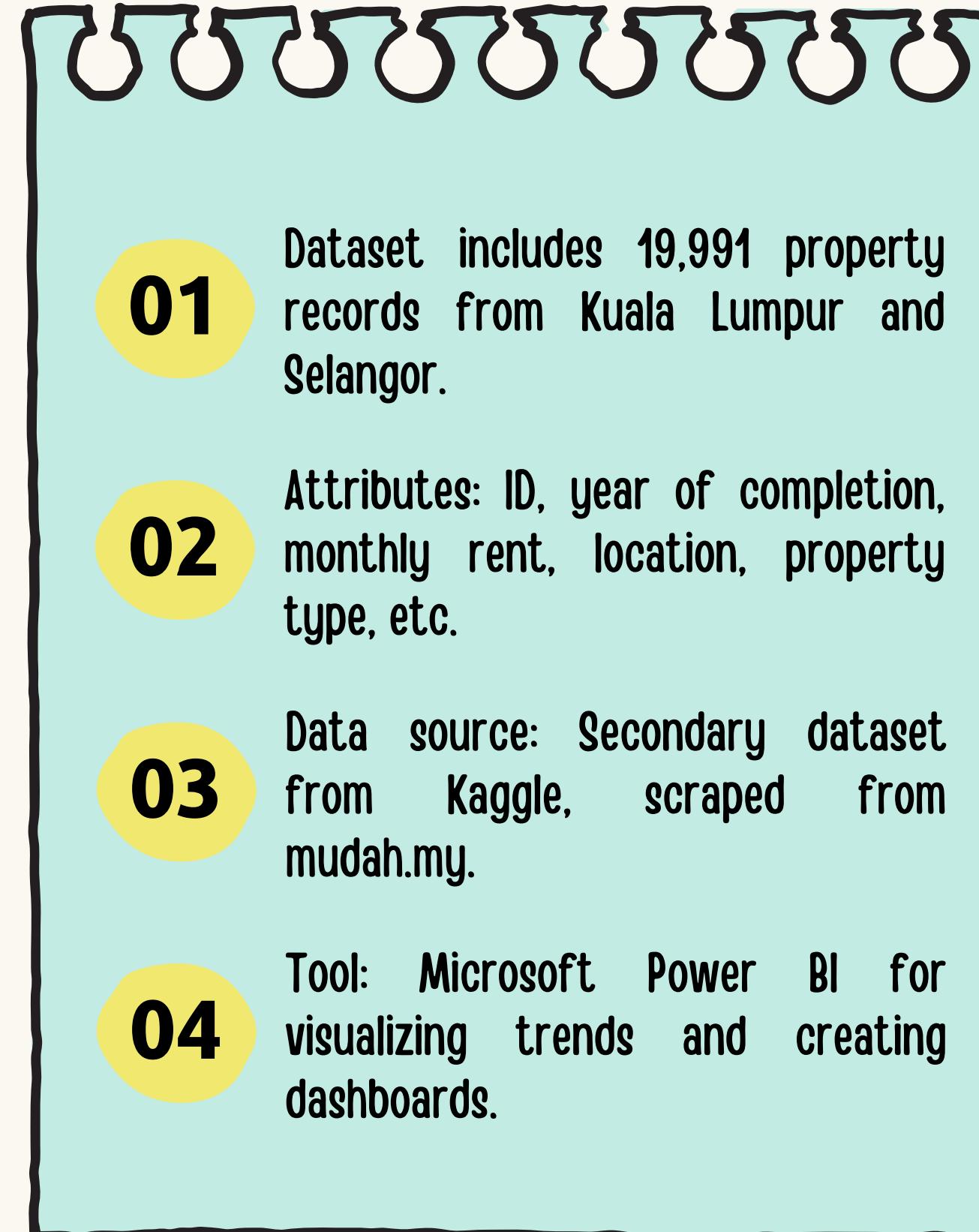
To generate different graphs to visualize data in a dashboard

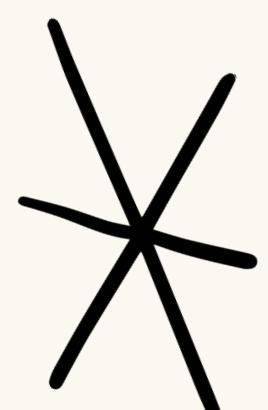
OBJECTIVES 3

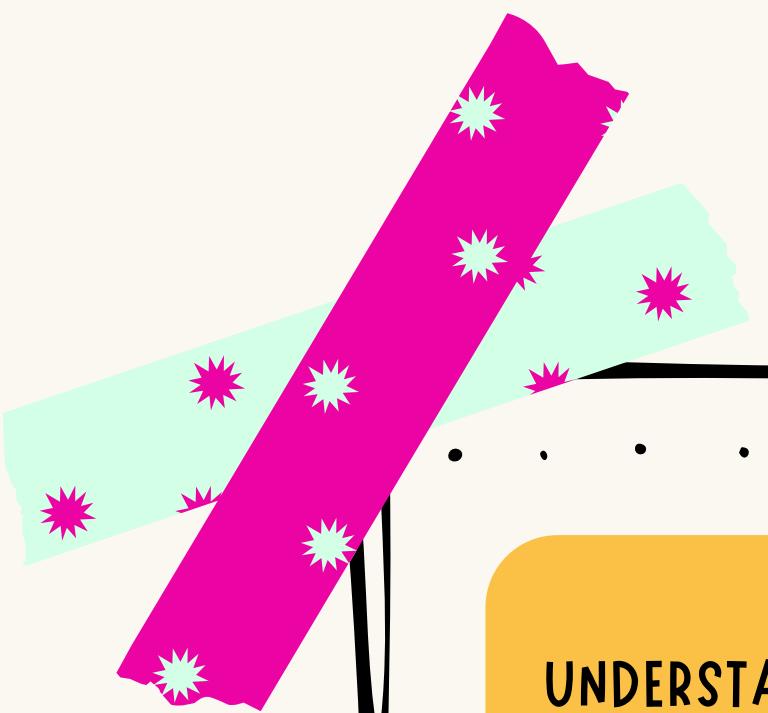
To analyze the data collected to obtain patterns and attributes that impact rent pricing



SCOPE

- 
- 01** Dataset includes 19,991 property records from Kuala Lumpur and Selangor.
 - 02** Attributes: ID, year of completion, monthly rent, location, property type, etc.
 - 03** Data source: Secondary dataset from Kaggle, scraped from mudah.my.
 - 04** Tool: Microsoft Power BI for visualizing trends and creating dashboards.





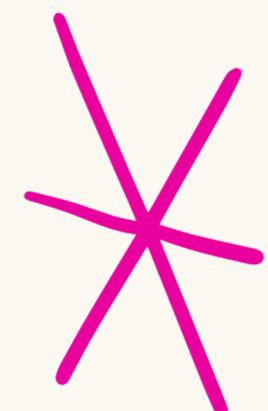
SIGNIFICANCE

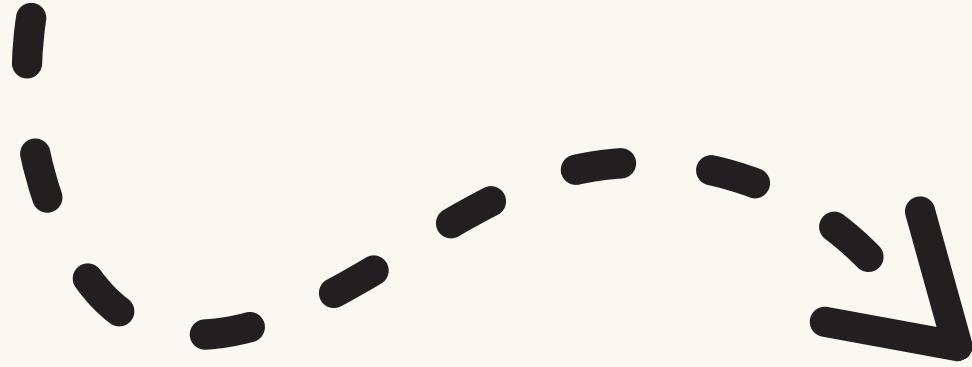
UNDERSTANDING MARKET TRENDS

- Identifies whether rental prices are rising, falling, or remaining stable in specific areas.
- Helps stakeholders understand market direction and make informed decisions.

DEMAND AND SUPPLY PATTERNS

- Rental prices are rising, it could indicate high demand and limited supply.
- Falling prices might suggest a surplus of rental properties or reduced demand





SIGNIFICANCE



IMPACT OF AFFORDABILITY ON PRICING

- Monthly income, property types, and house price affect rental prices.
- Enables property owners, investors, and tenants to understand why prices in one area might be higher than in another.

MARKET INSIGHTS FOR STAKEHOLDERS

- Provides valuable insights into trends, demand-supply, and location-based pricing.
- Supports property owners, investors, and tenants in making informed decisions.
- Insights enable stakeholders to implement competitive pricing strategies in the rental market.





Chapter 2

Literature Review

- 2.1 Rental Pricing
- 2.2 Residential property
- 2.3 Affordable Housing In Malaysia
- 2.4 Market Trend
- 2.5 Factors Influencing Rental Prices
 - 2.5.1 Financial Considerations
 - 2.5.2 Demographic and Social Factors
 - 2.5.3 Property-Specific and Public Amenities
 - 2.5.4 Household Income
 - 2.5.5 Interest Rate
 - 2.5.6 Flexibility to Move

Critical Market Factors

- Infrastructure: Connectivity and facilities influencing demand and pricing.
- Urban development: Growth patterns affecting rental costs.
- Economic conditions: Role in shaping affordability and investment attractiveness.

Definition

- Definition of rental pricing: Sum charged for short-term use of properties.
- Importance: Impacts housing affordability, investment opportunities, and economic stability.

2.1 Rental PRICING

Selangor: Suburban and Rural Blend

- Overview: Surrounds Kuala Lumpur, offering a mix of suburban and rural living.
- Cost advantage: Relatively lower rental costs compared to Kuala Lumpur.
- Appeal: Spacious living options catering to families and those seeking affordability.

Benefits of Renting

- Cost management: Reduces current monthly expenses.
- Alternative to property purchase: Avoids large upfront financial commitments.

Kuala Lumpur: Urban Rental Dynamics

- Overview: Vibrant capital with diverse neighborhoods and real estate options.
- Property types: Landed homes to high-rise apartments.
- Market factors: Urban development and high demand drive pricing dynamics.

RESIDENTIAL PROPERTY

2.2



• INTRODUCTION

- **Definition:** Real estate primarily for housing.
- **Examples:** Single-family homes, apartments, condominiums, townhouses.
- **Purpose:**
 - Provides shelter and comfort.
 - Reflects social and economic status.
- **Ownership Benefits:**
 - Long-term investment
 - Potential for capital growth and rental income.

• CHALLENGES

- **Affordability Issues:**
 - High construction costs.
 - Limited land availability in urban areas.
- **Rising Cost of Living:**
 - Increased expenses for food, transportation, and essential facilities.
- **Saving for a Down Payment:**
 - Economic burden makes saving difficult.

AFFORDABLE HOUSING IN MALAYSIA

Malaysia faces a housing crisis due to a supply-demand mismatch and slower income growth. Developers prioritize expensive homes, leaving affordable options scarce. Families struggle with rising property prices, compounded by low financial literacy and a preference for owning over renting.

In Q2 2017, 146,497 unsold units were mostly priced above RM250,000, failing to meet average household needs. Solutions include policies to boost affordable housing, financial literacy programs, and aligning income growth with property prices.

MARKET TREND

In Q4 2021, rental demand surged with a 30.53% QoQ and 57.91% YoY increase, driven by affordability issues and changing preferences. Despite rising demand, rental prices showed mixed trends, with a 0.74% QoQ rise but a 2.91% YoY drop. Rental supply grew by 13.78% QoQ, offering more options after four quarters of decline.

Nationwide, the average rent is RM1,920 (+1.8% YoY), with Kuala Lumpur at RM2,735 (+7.6%) and Selangor at RM1,879 (fully recovered to pre-pandemic levels). Slower rental growth signals potential affordability improvements, influenced by urban housing demand and economic growth.

2.5 Factors Influencing Rental Prices

Financial Considerations

Inflation and income levels impact tenants' affordability and landlords' pricing strategies.

Demographic and Social Factors

Age, income, and lifestyle preferences shape rental demand, especially in urban areas.

Property-Specific and Public Amenities

Property type and proximity to amenities like schools and transport influence rental value.

Household Income

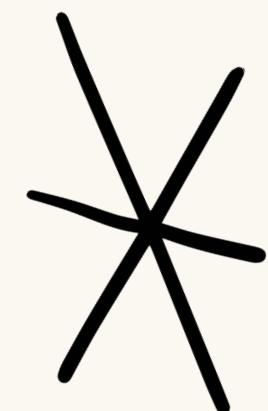
The gap between income growth and housing costs creates affordability challenges.

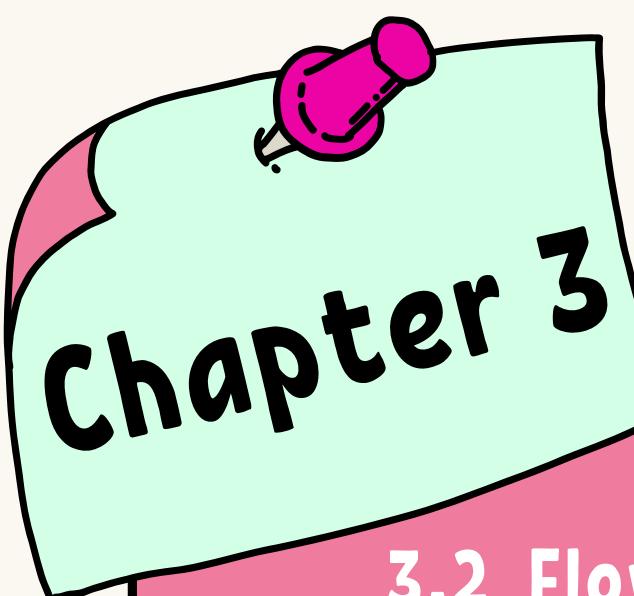
Interest Rate

Higher interest rates drive demand for rentals, leading to price increases.

Flexibility to Move

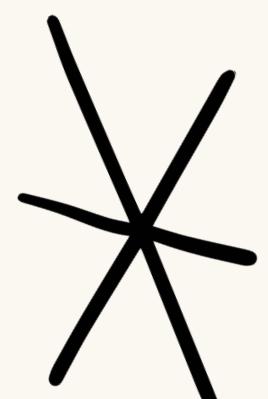
Accessibility to public transportation raises demand and rental prices in connected areas.



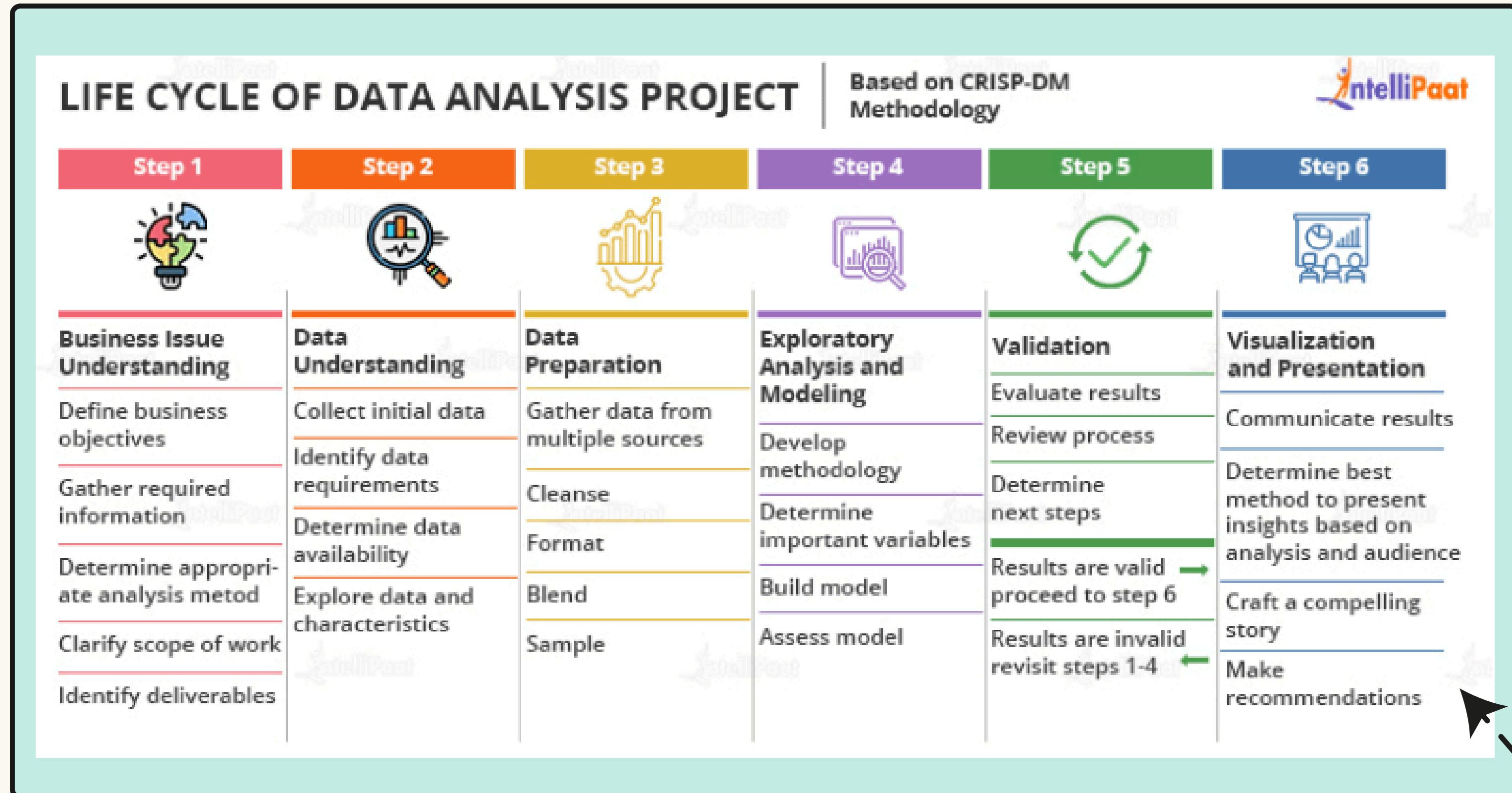


Methodology

- 3.2 Flow of the Project**
- 3.3 User Requirement**
- 3.4 Research Questions**
- 3.5 Data Collection**
- 3.6 Data Description**
- 3.7 Data Preparation**
 - **3.7.1 Edit Data Types and Rename Attributes**
 - **3.7.2 Replace Missing Values**
 - **3.7.3 Remove Outliers and Extreme Values**
 - **3.7.4 Numeric to Nominal**
 - **3.7.5 Select Attributes**
- 3.8 Data Dictionary**
- 3.9 Exploratory Data Analysis**



3.2 Flow of The Project



3.3 USER REQUIREMENTS



- PURPOSE

To assist users in analyzing rental pricing trends in Kuala Lumpur, Malaysia.

- OBJECTIVE

Provide users with a clearer understanding of the rental market through:

- Clear, engaging, and well-organized information.
- Effective use of data visualization techniques.

- BENEFITS

- Enable users to explore price variations across different areas and property types.
- Simplify decision-making for users regarding rental properties.



3.4

RESEARCH QUESTIONS



- 1** How does the completion year of properties influence their categorization into different monthly rent ranges?
- 2** How does property furnished status and the average number of rooms in Kuala Lumpur and Selangor affect the Monthly Rent?
- 3** What is the percentage of properties are fully furnished, partly furnished, or not furnished in Kuala Lumpur and Selangor?
- 4** How does furnishing options change for different property types in Kuala Lumpur and Selangor?
- 5** What do the rental price ranges show about the affordability of properties in Kuala Lumpur and Selangor?



3.5 DATA COLLECTION

Dataset Details :

- Total Columns: 14.
- Total Rows: 19,991.

Dataset :

Rental Pricing Dataset

Source

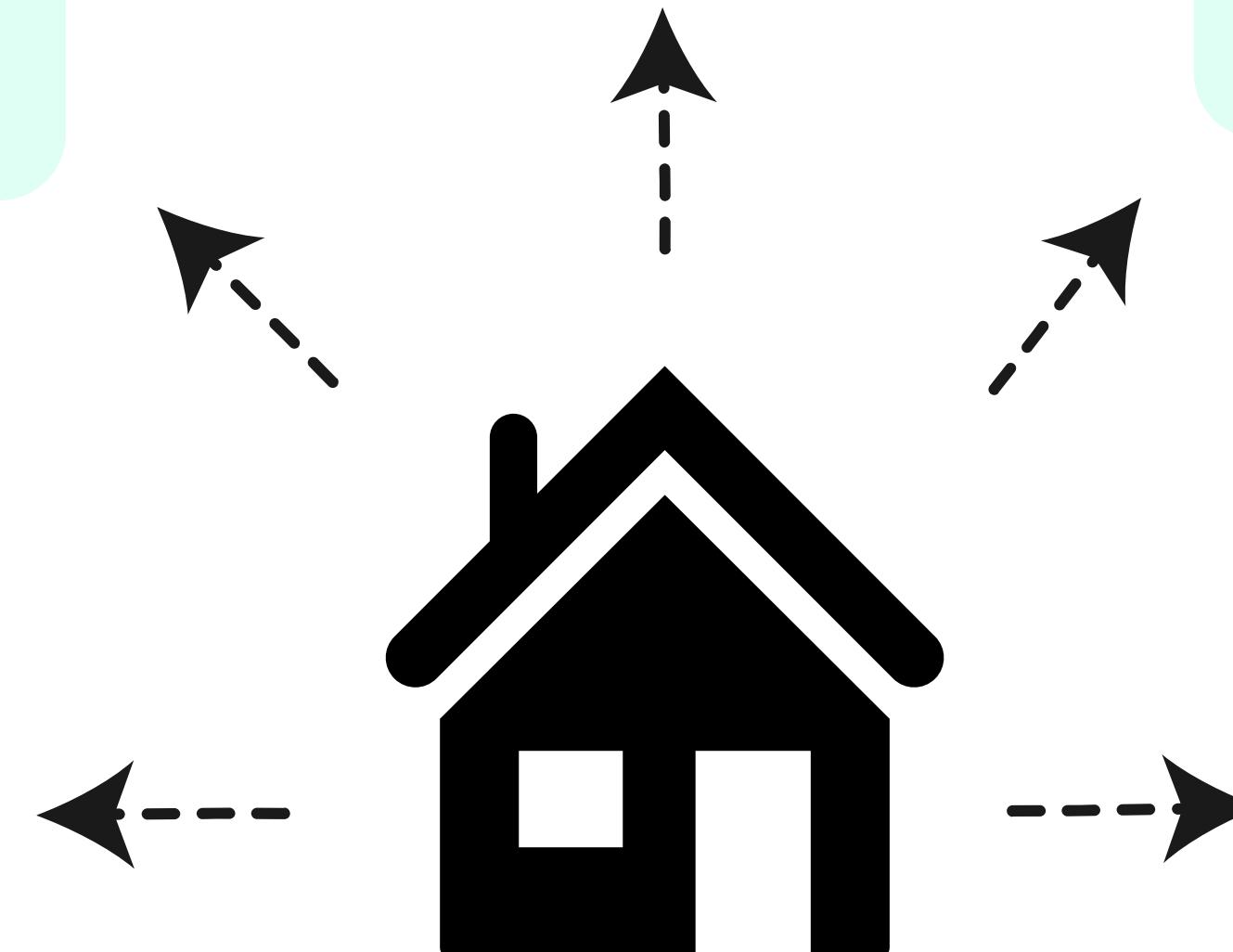
Kaggle

Selected Columns for Visualization

- Columns: monthly_rent, facilities, prop_name, size, location, additional_facilities, property_type, furnished_rooms, and completion_year.
- Filtered Rows: 12,539 rows.

Coverage

Rent pricing data for Kuala Lumpur and Selangor regions in Malaysia.

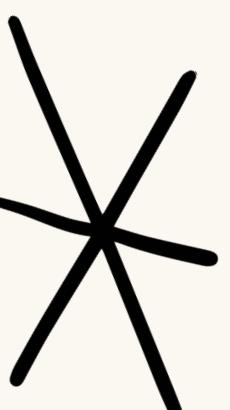
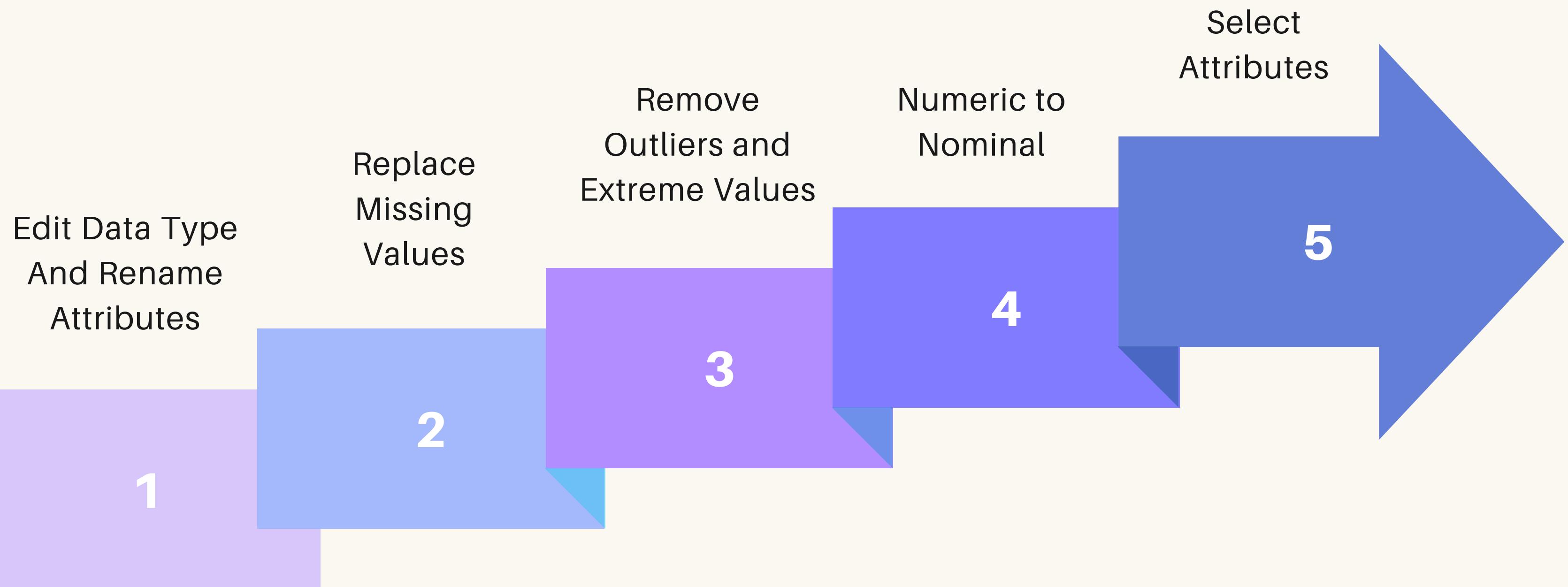


3.6 DATA DESCRIPTION

Each of the attributes in the dataset are discussed in this table.

NO	Attributes	Description
1.	monthly_rent	monthly rent in ringgit malaysia (RM)
2.	facilities	main facilities available
3.	prop_name	name of the building/ property
4.	size	total area of the unit in square feet
5.	location	property location in Kuala Lumpur and Selangor region
6.	additional_facilities	additional facilities (proximity to attraction area, mall, school, shopping, railways, etc)
7.	property_type	property type such as apartment, condominium, flat, duplex, studio, etc
8.	furnished	furnishing status of the unit (fully, partial, non-furnished)
9.	rooms	number of rooms in the unit
10.	completion_year	completion/ established year of the property

3.7 DATA PREPARATION



3.7 DATA PREPARATION

Edit Data Type And Rename Attributes

Before	After
ads_id	ads_id
prop_name	prop_name
completion_year	completion_year
monthly_rent	monthly_rent (RM/per month)
location	location
property_type	property_type
rooms	rooms
parking	parking
bathroom	bathroom
size	size (sq.ft.)
furnished	furnished
facilities	facilities
additional_facilities	additional_facilities
region	region

3.7 DATA PREPARATION

Replace Missing Values

Selected attribute Name: prop_name Missing: 948 (5%)	Selected attribute Name: completion_year Missing: 9185 (46%)	Selected attribute Name: monthly_rent (RM/per month) Missing: 2 (0%) Distinct: 387
Selected attribute Name: rooms Missing: 6 (0%)	Selected attribute Name: parking Missing: 5702 (29%)	Selected attribute Name: bathroom Missing: 6 (0%)
Selected attribute Name: facilities Missing: 2209 (11%)	Selected attribute Name: additional_facilities Missing: 5948 (30%)	

3.7 DATA PREPARATION

Remove Outliers and
Extreme Values

Before				After			
Selected attribute				Selected attribute			
Name: Outlier		Type: Nominal		Name: Outlier		Type: Nominal	
Missing: 0 (0%)		Distinct: 2		Missing: 0 (0%)		Distinct: 1	
No.	Label	Count	Weight	No.	Label	Count	Weight
1	no	17882	17882	1	no	17882	17882
2	yes	2109	2109	2	yes	0	0

Before				After			
Selected attribute				Selected attribute			
Name: ExtremeValue		Type: Nominal		Name: ExtremeValue		Type: Nominal	
Missing: 0 (0%)		Distinct: 2		Missing: 0 (0%)		Distinct: 1	
No.	Label	Count	Weight	No.	Label	Count	Weight
1	no	12539	12539	1	no	12539	12539
2	yes	5343	5343	2	yes	0	0

3.7 DATA PREPARATION

Numeric to Nominal

Completion Year

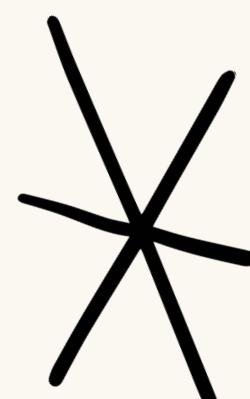
Before		After																																			
<p>Selected attribute Name: completion_year Missing: 9185 (46%) Distinct: 42 Unique: 2 (0%)</p> <table><thead><tr><th>Statistic</th><th>Value</th></tr></thead><tbody><tr><td>Minimum</td><td>1977</td></tr><tr><td>Maximum</td><td>2025</td></tr><tr><td>Mean</td><td>2014.822</td></tr><tr><td>StdDev</td><td>6.735</td></tr></tbody></table>		Statistic	Value	Minimum	1977	Maximum	2025	Mean	2014.822	StdDev	6.735	<p>Selected attribute Name: completion_year Type: Nominal Missing: 0 (0%) Distinct: 5 Unique: 0 (0%)</p> <table><thead><tr><th>No.</th><th>Label</th><th>Count</th><th>Weight</th></tr></thead><tbody><tr><td>1</td><td>2015-2017</td><td>7972</td><td>7972</td></tr><tr><td>2</td><td>2018-2020</td><td>1930</td><td>1930</td></tr><tr><td>3</td><td>2020-2023</td><td>1564</td><td>1564</td></tr><tr><td>4</td><td>2012-2014</td><td>672</td><td>672</td></tr><tr><td>5</td><td>2009-2011</td><td>401</td><td>401</td></tr></tbody></table>		No.	Label	Count	Weight	1	2015-2017	7972	7972	2	2018-2020	1930	1930	3	2020-2023	1564	1564	4	2012-2014	672	672	5	2009-2011	401	401
Statistic	Value																																				
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Maximum	2025																																				
Mean	2014.822																																				
StdDev	6.735																																				
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1	2015-2017	7972	7972																																		
2	2018-2020	1930	1930																																		
3	2020-2023	1564	1564																																		
4	2012-2014	672	672																																		
5	2009-2011	401	401																																		

Monthly Rent (RM/per month)

Before		After																																			
<p>Selected attribute Name: monthly_rent (RM/per mo... Missing: 2 (0%) Distinct: 387 Unique: 148 (1...)</p> <table><thead><tr><th>Statistic</th><th>Value</th></tr></thead><tbody><tr><td>Minimum</td><td>70</td></tr><tr><td>Maximum</td><td>2400000</td></tr><tr><td>Mean</td><td>2269.084</td></tr><tr><td>StdDev</td><td>22412.852</td></tr></tbody></table>		Statistic	Value	Minimum	70	Maximum	2400000	Mean	2269.084	StdDev	22412.852	<p>Selected attribute Name: monthly_rent (RM/per mo... Missing: 0 (0%) Distinct: 5 Unique: 0 (0%)</p> <table><thead><tr><th>No.</th><th>Label</th><th>Count</th><th>Weight</th></tr></thead><tbody><tr><td>1</td><td>Medium</td><td>3054</td><td>3054</td></tr><tr><td>2</td><td>Medium-Low</td><td>7111</td><td>7111</td></tr><tr><td>3</td><td>Medium-High</td><td>1010</td><td>1010</td></tr><tr><td>4</td><td>High</td><td>306</td><td>306</td></tr><tr><td>5</td><td>Low</td><td>1058</td><td>1058</td></tr></tbody></table>		No.	Label	Count	Weight	1	Medium	3054	3054	2	Medium-Low	7111	7111	3	Medium-High	1010	1010	4	High	306	306	5	Low	1058	1058
Statistic	Value																																				
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Maximum	2400000																																				
Mean	2269.084																																				
StdDev	22412.852																																				
No.	Label	Count	Weight																																		
1	Medium	3054	3054																																		
2	Medium-Low	7111	7111																																		
3	Medium-High	1010	1010																																		
4	High	306	306																																		
5	Low	1058	1058																																		

Size(sq.ft.)

Before		After																											
<p>Selected attribute Name: size (sq.ft.) Missing: 0 (0%) Distinct: 1215 Unique: 300 (2%)</p> <table><thead><tr><th>Statistic</th><th>Value</th></tr></thead><tbody><tr><td>Minimum</td><td>1</td></tr><tr><td>Maximum</td><td>9999999</td></tr><tr><td>Mean</td><td>5922.172</td></tr><tr><td>StdDev</td><td>707259.587</td></tr></tbody></table>		Statistic	Value	Minimum	1	Maximum	9999999	Mean	5922.172	StdDev	707259.587	<p>Selected attribute Name: size (sq.ft.) Type: Nominal Missing: 0 (0%) Distinct: 3 Unique: 0 (0%)</p> <table><thead><tr><th>No.</th><th>Label</th><th>Count</th><th>Weight</th></tr></thead><tbody><tr><td>1</td><td>Medium</td><td>11790</td><td>11790</td></tr><tr><td>2</td><td>Large</td><td>594</td><td>594</td></tr><tr><td>3</td><td>Small</td><td>155</td><td>155</td></tr></tbody></table>		No.	Label	Count	Weight	1	Medium	11790	11790	2	Large	594	594	3	Small	155	155
Statistic	Value																												
Minimum	1																												
Maximum	9999999																												
Mean	5922.172																												
StdDev	707259.587																												
No.	Label	Count	Weight																										
1	Medium	11790	11790																										
2	Large	594	594																										
3	Small	155	155																										



3.7 DATA PREPARATION

Select Attributes

Weka Explorer

Preprocess Classify Cluster Associate **Select attributes** Visualize

Attribute Evaluator

Choose GainRatioAttributeEval

Search Method

Choose Ranker -T -1.7976931348623157E308 -N -1

Attribute Selection Mode

Use full training set

Cross-validation Folds 10
Seed 1

(Nom) monthly_rent

Start Stop

Result list (right-click for options)

22:41:06 - BestFirst + CfsSubsetEval
22:41:18 - Ranker + InfoGainAttributeEval
22:41:34 - Ranker + InfoGainAttributeEval
22:41:39 - Ranker + GainRatioAttributeEval

Attribute selection output

monthly_rent

Evaluation mode: evaluate on all training data

==== Attribute Selection on all input data ===

Search Method:
Attribute ranking.

Attribute Evaluator (supervised, Class (nominal): 14 monthly_rent):
Gain Ratio feature evaluator

Ranked attributes:

0.3582	11 facilities
0.3242	2 prop_name
0.2424	10 furnished
0.2405	9 size
0.2091	5 property_type
0.1679	4 location
0.1422	12 additional_facilities
0.1416	3 completion_year
0.1114	6 rooms
0.1116	13 region
0.0844	1 ads_id
0	8 bathroom
0	7 parking

Selected attributes: 11,2,10,9,5,4,12,3,6,13,1,8,7 : 13

3.8 DATA DICTIONARY

Data dictionary outlining information on rent pricing surrounding Kuala Lumpur and Selangor region, Malaysia.

NO	Attributes	Data Format	Type	Field Size
1.	monthly_rent	-	String	286
2.	facilities	-	String	6893
3.	prop_name	-	String	2043
4.	size	-	String	767
5.	location	-	String	122
6.	additional_facilities	-	String	141
7.	property_type	-	String	9
8.	furnished	-	String	3
9.	rooms	-	Decimal	8
10.	completion_year	-	Decimal	16

3.9 EXPLORATORY DATA ANALYSIS

Monthly Rent

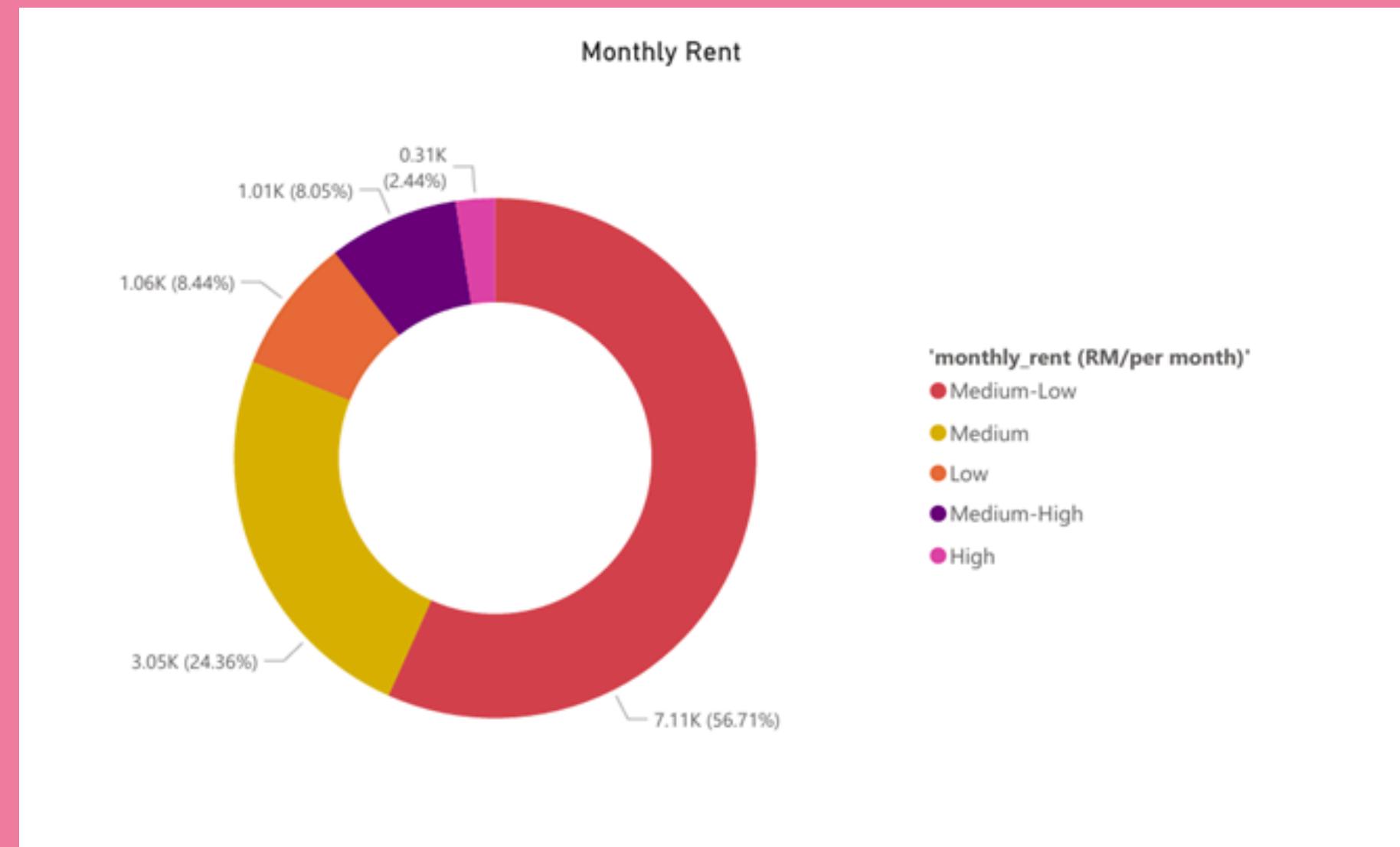


Figure 3.3

Doughnut Chart

- Figure 3.3 illustrates the monthly rent distribution in the Kuala Lumpur and Selangor.
- The largest share of properties falls under the 'Medium-Low' rent category, comprising 56.71% of the market.
- 'Medium' rent properties are the second most common, making up 24.36% of the market.
- Low, Medium-High, and High rent categories are less prevalent, representing 8.44%, 8.05%, and 2.44%, respectively.
- This distribution highlights that affordability is a key factor influencing housing choices in the region, with most renters opting for budget-friendly options.

3.9 EXPLORATORY DATA ANALYSIS

Furnished

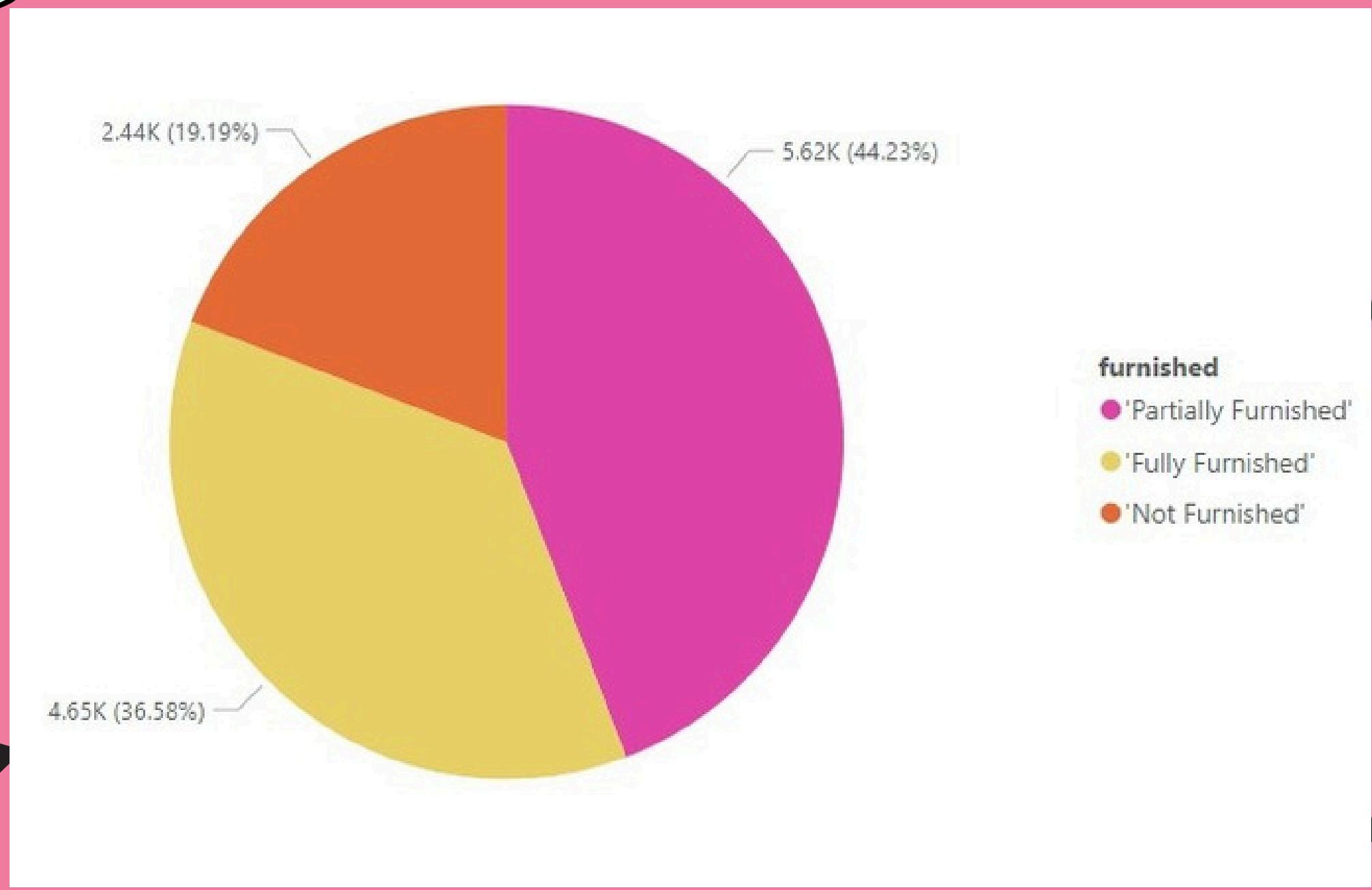


Figure 3.4

Pie Chart

Figure 3.4 is a pie chart that shows the distribution of house furnishing which can be divided in 3 sections,

fully furnished : 36.58%

partially furnished : 44.23%

not furnished : 19.19%

Partially furnished properties dominated the rental market, followed by property that are fully furnished and lastly property that are not furnished

3.9 EXPLORATORY DATA ANALYSIS

Property Size

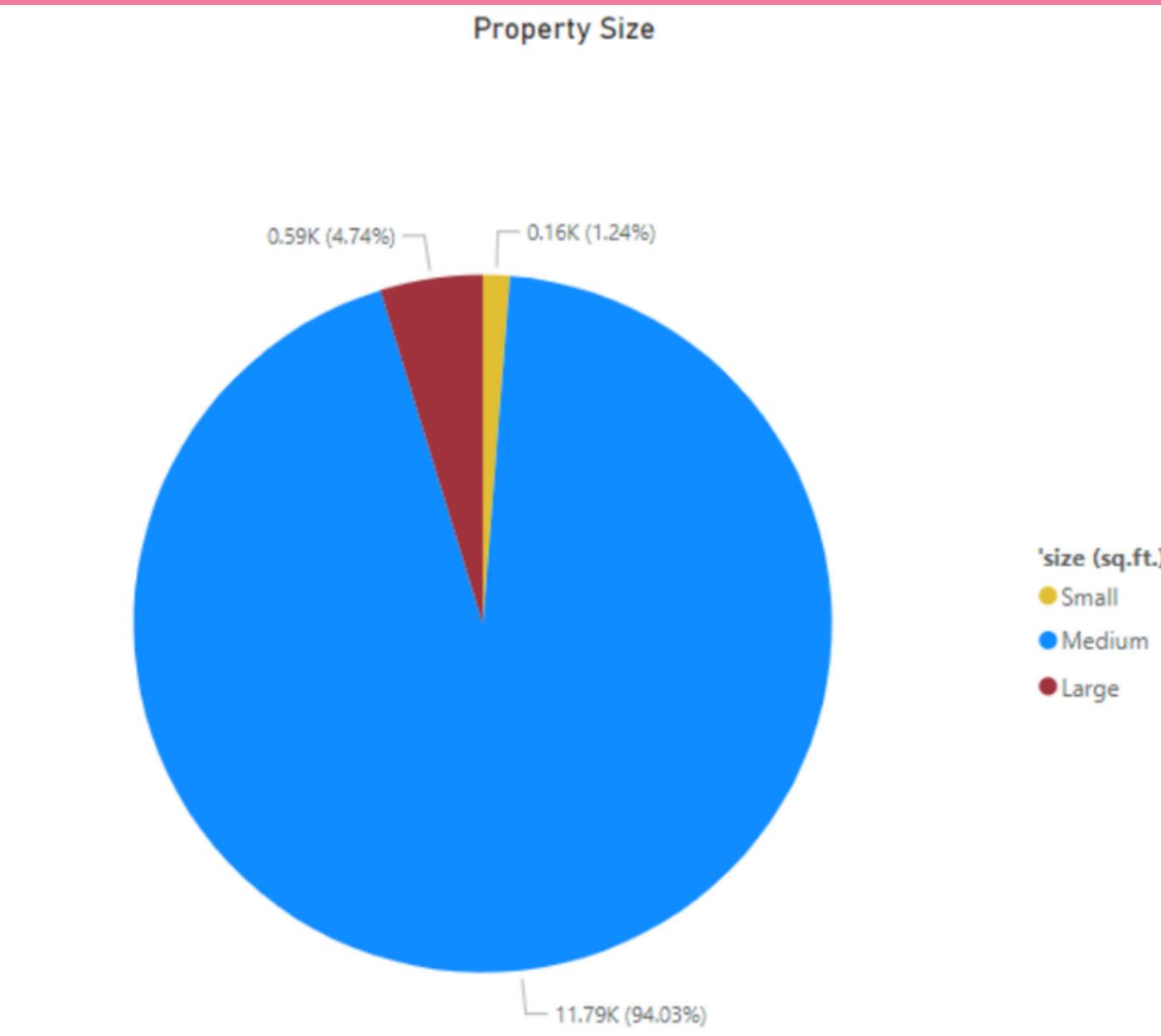


Figure 3.5

Pie Chart

- Figure 3.5 illustrates the property size distribution in the Kuala Lumpur and Selangor regions.
- Categorized as:
 - Medium = 94.03%
 - Large = 4.74%
 - Small = 1.24%
- The data is heavily skewed towards Medium-sized properties
- This indicate that the majority of properties in the dataset fall into Medium-sized
- This suggests that factors like affordability and availability of medium-sized properties have a bigger impact on rental prices in Kuala Lumpur and Selangor than small or large properties.

3.9 EXPLORATORY DATA ANALYSIS

Completion Year

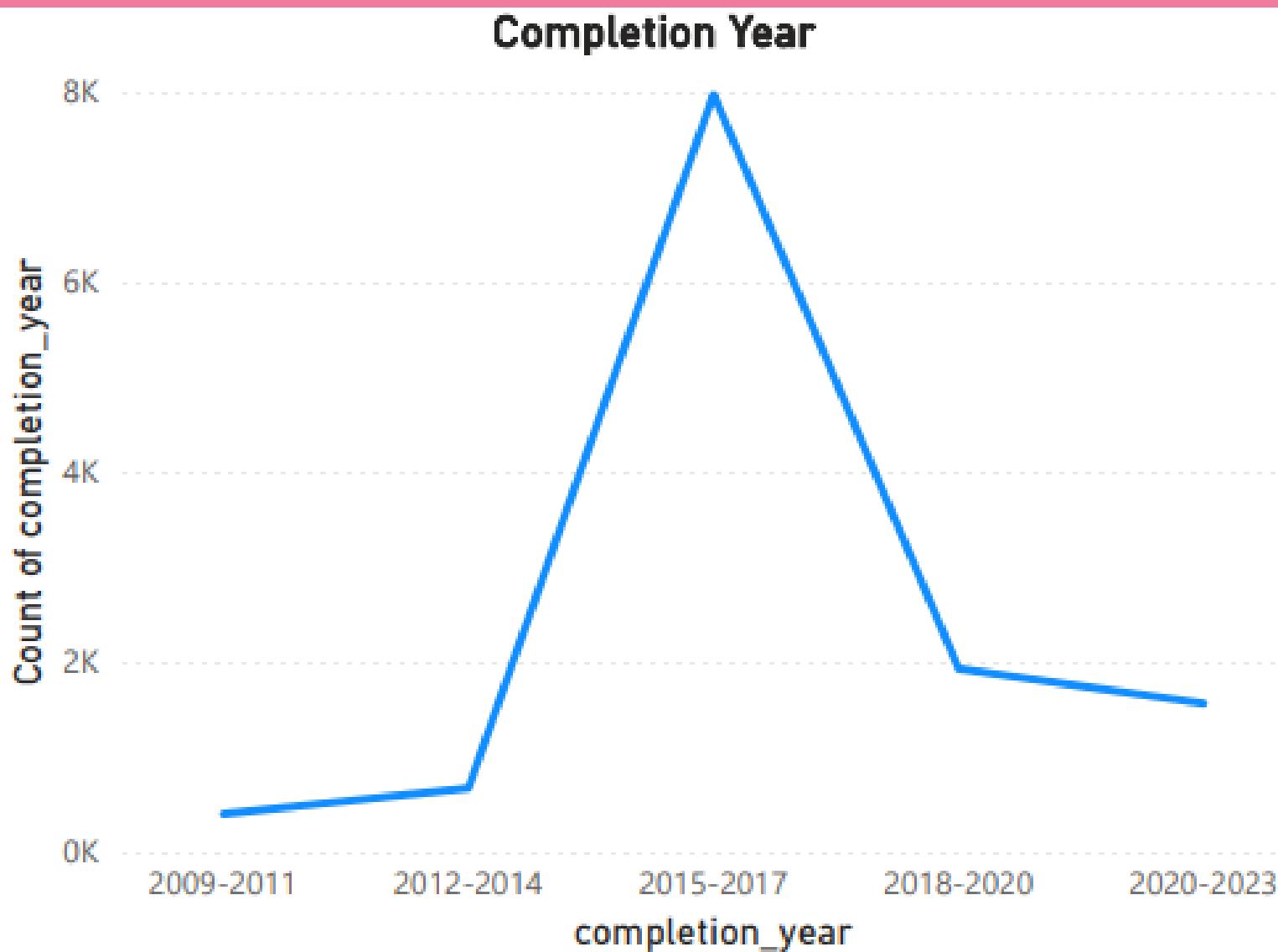


Figure 3.6

Line Chart

- Figure 3.6 represents the count of properties categorized by their completion years.
- 2009–2011: Low property completion counts, reflecting low construction activity.
- 2012–2014: Gradual increase in property completions.
- 2015–2017: Sharp peak, highest property completions, likely driven by high demand or favorable economic conditions.
- 2018–2020 & 2020–2023: Significant decline in property completions, suggesting market slowdown, reduced demand, or policy changes.
- The chart highlights the changing in property completions affect rental pricing trends in Kuala Lumpur and Selangor.

3.9 EXPLORATORY DATA ANALYSIS

Sum of Rooms by Room Numbers

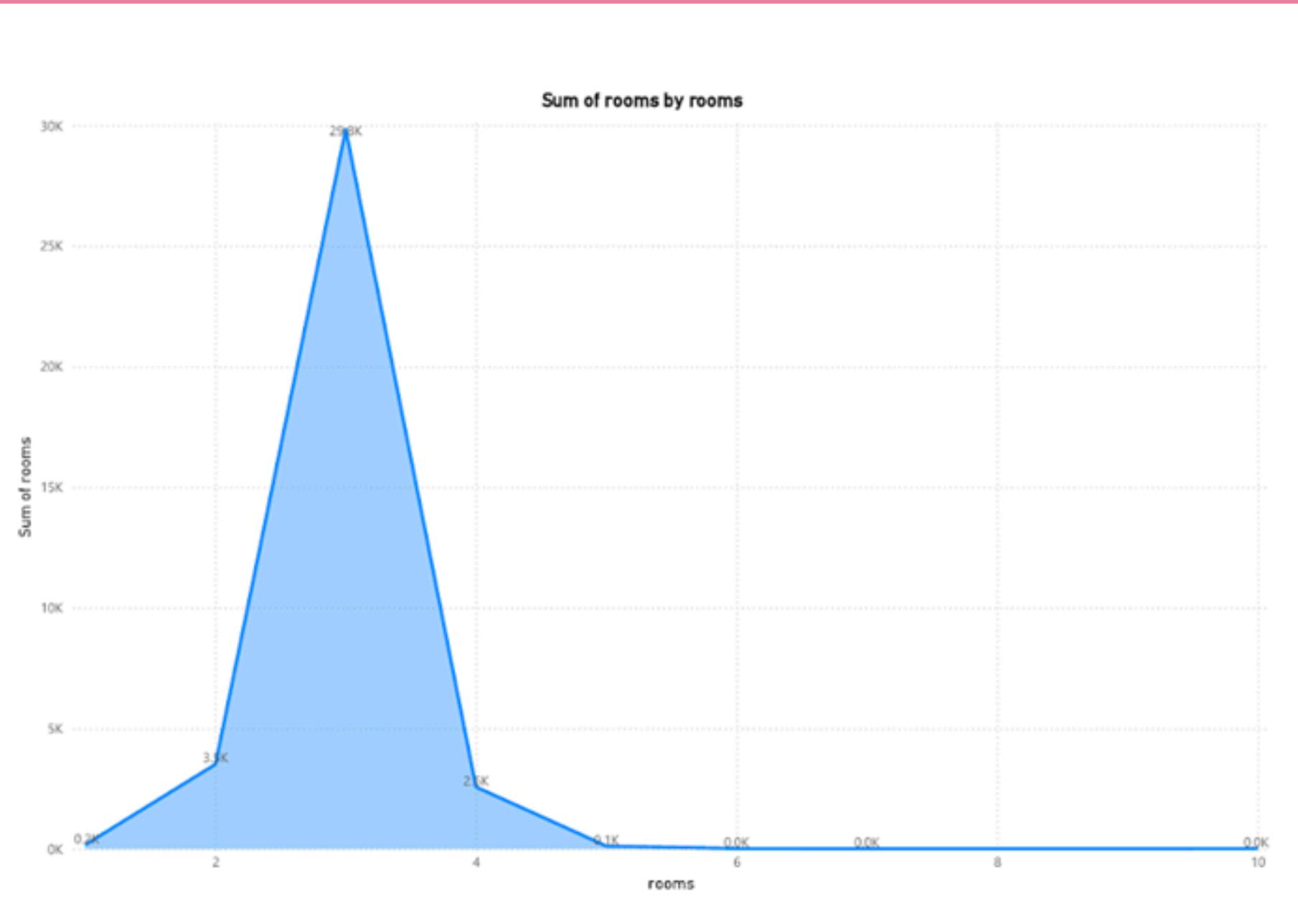


Figure 3.7

Line Chart

Figure 3.7 shows the sum of rooms based on different categories of room numbers. The total number of rooms reaches approximately 29,800 for 3 rooms, while the minimum value is 7 among room 6 and onwards which indicates that only a few properties consist of 6 rooms or more. This proves that most properties in the Kuala Lumpur and Selangor region consist of a standard amount of 3 rooms in one property only.

3.9 EXPLORATORY DATA ANALYSIS

Property Name

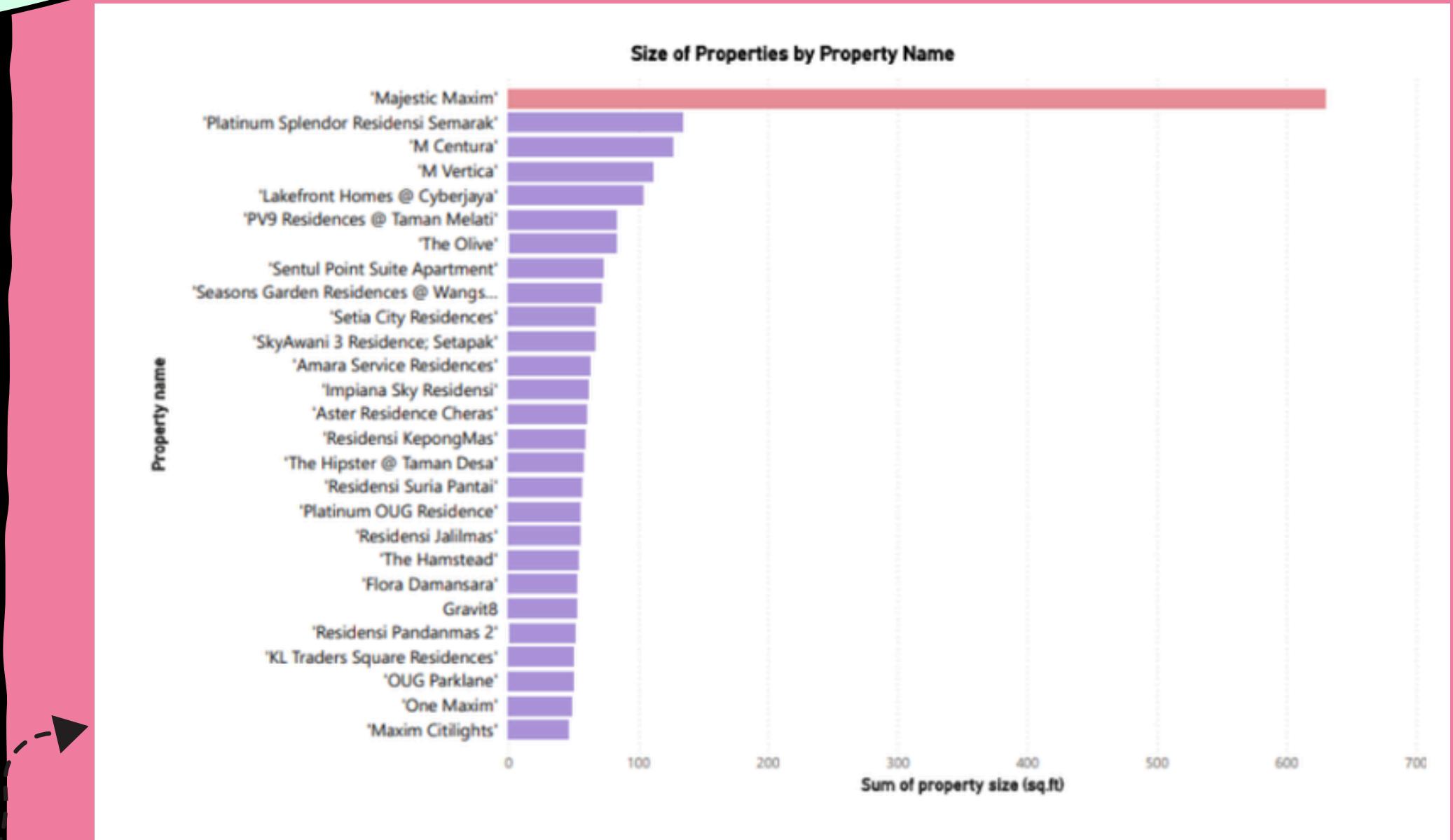


Figure 3.8

Stacked Bar Chart

- Figure 3.8 is a bar chart representing the total size of properties by property name Kuala Lumpur and Selangor.
- Majestic Maxim has the largest total property size, followed by Platinum Splendor Residence Semarak and M Centura.
- These properties stand out due to their significantly larger sizes compared to others.
- Larger properties likely cater to high demand and market segments.
- Smaller properties focus on providing compact and affordable housing options, showcasing the diversity of property sizes to meet various market needs.

3.9 EXPLORATORY DATA ANALYSIS

Property Types

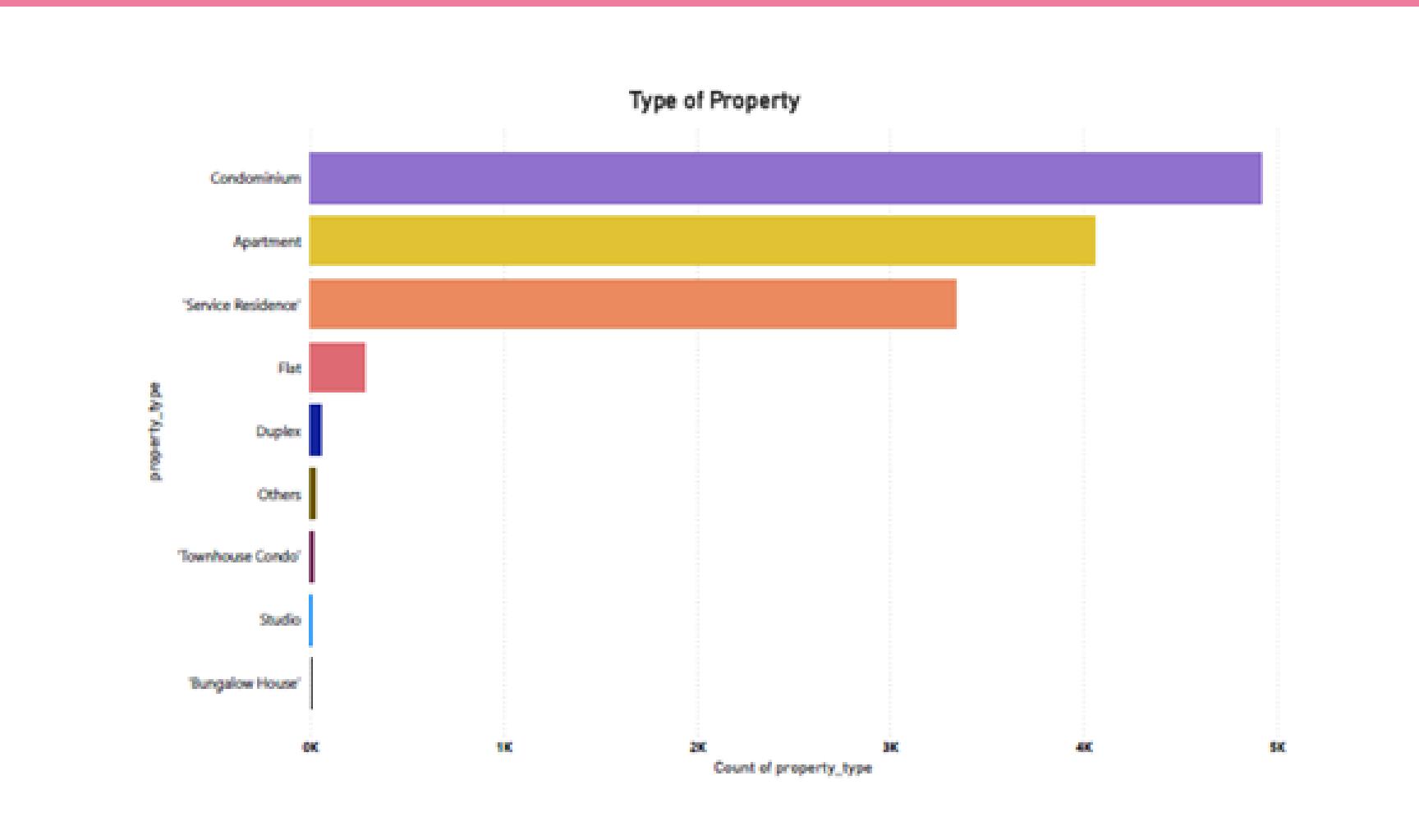


Figure 3.9

Stacked Bar Chart

- Figure 3.9 illustrates the distribution of property types in the Kuala Lumpur and Selangor regions.
- Condominiums are the most common property type with approximately 4,500 units, followed by Apartments with around 3,800 units and Service Residences totaling about 3,200 units.
- These property types are concentrated in urban areas.
- Condominiums and apartments dominate the market due to their accessibility and suitability for city living, while service residences attract those seeking a blend of residential and serviced amenities.

3.9 EXPLORATORY DATA ANALYSIS

Property Locations

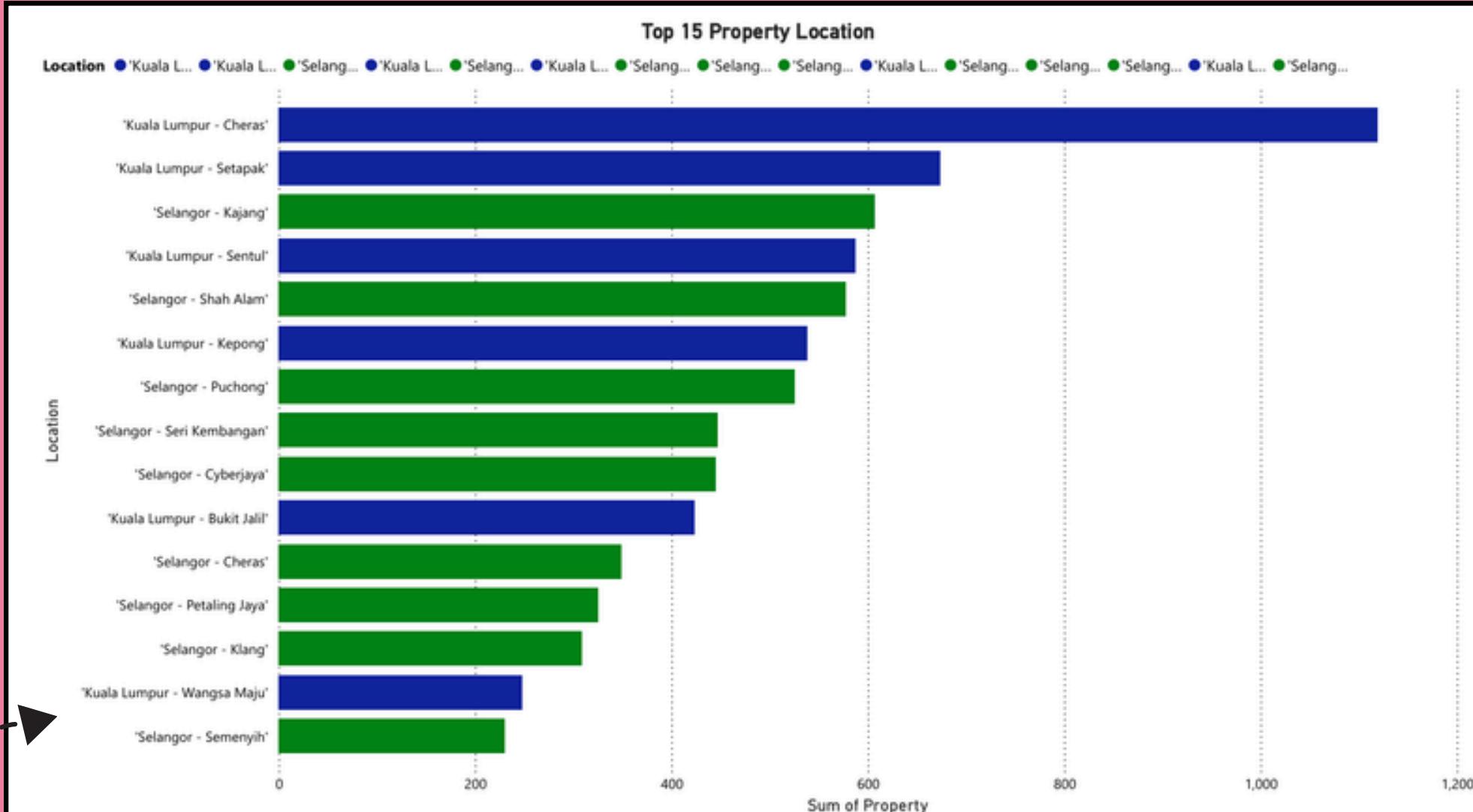
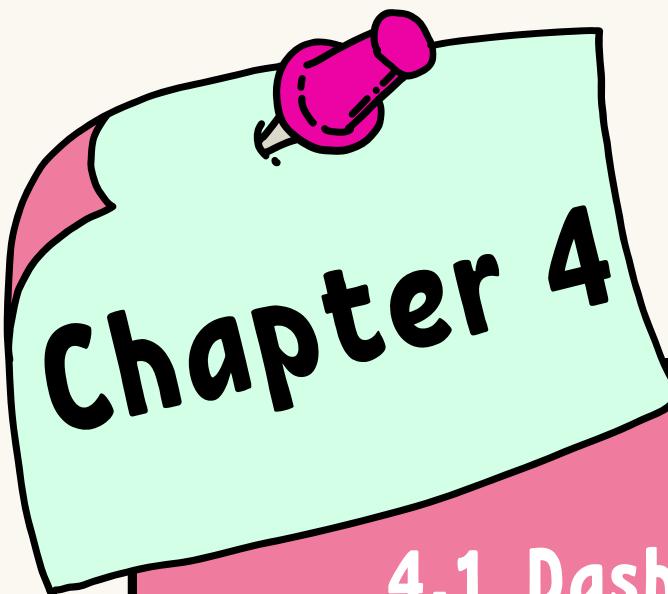


Figure 3.10

Stacked Bar Chart

- Figure 3.10 highlights the top 15 property locations in Kuala Lumpur and Selangor.
- The top three locations are Kuala Lumpur - Cheras with 1,119 properties, Kuala Lumpur - Setapak with 674, and Selangor - Kajang with 607.
- Most properties are concentrated in urban areas of Kuala Lumpur and nearby urbanized parts of Selangor. While this data may not fully represent smaller or less urbanized areas, it provides insight into the real estate markets in major towns.



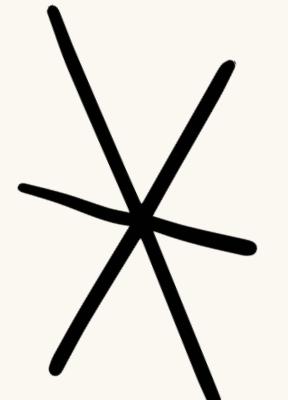
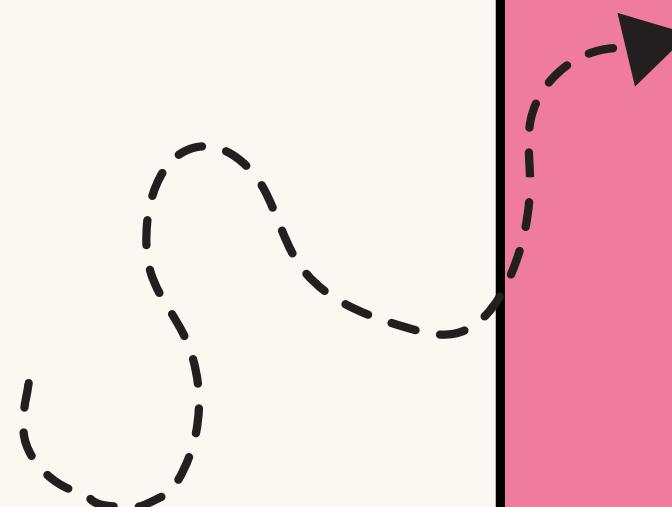
Design & Development

4.1 Dashboard Sketch

4.2 User Interface

4.4 Basic Visualization Design

- **4.4.1 Tree Map**
- **4.4.2 Ribbon Chart**
- **4.4.3 Doughnut Chart**
- **4.4.4 Stacked Bar Chart**
- **4.4.5 Aster Plot**



4.1 DASHBOARD SKETCH



DASHBOARD HIGHLIGHTS

- **Aster Plot Chart:** Distribution of property types across monthly rent categories.
- **Treemap Chart:** Monthly rent distribution by property completion year and rent categories.
- **Ribbon Chart:** Average number of rooms based on completion year and monthly rent.
- **Donut Chart:** Distribution of properties by furnishing status.
- **Stacked Bar Chart:** Rooms distribution by property type and furnishing status.

INSIGHTS

- Availability of furnished properties.
- Trends in rental pricing ranges.
- Impact of completion year and furnishing status on rental patterns.



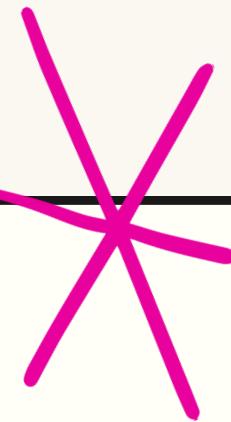
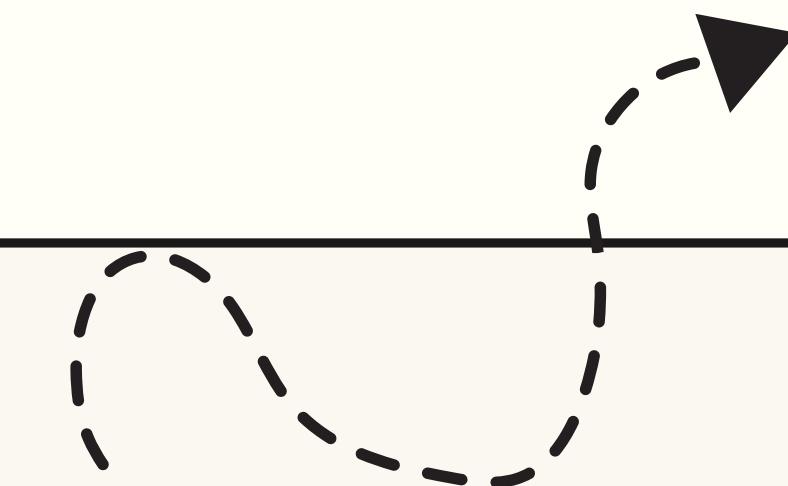
4.2 USER INTERFACE

Method for Dashboard Design

Data-Driven Design

HIGHLIGHTING THE PRESENTATION OF RELEVANT, ACCURATE AND WELL-VISUALIZED DATA (DIAMOND ET AL., 2017)

- Define the Research Question: To ensure the scope is reduced and only relevant information is chosen for study.
- Identify Relevant Metrics: Select metrics that directly relate to research questions and focus on important metrics.
- Visualize Data Effectively: Employ different chart types to represent data effectively.



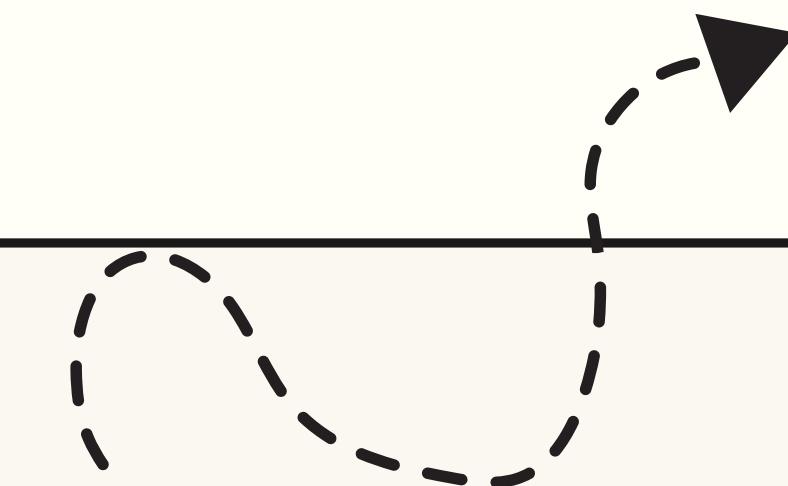
4.2 USER INTERFACE

Method for Dashboard Design

Layout and structure

STRUCTURING DASHBOARD COMPONENTS FOR CLARITY AND SIMPLICITY (BACH ET AL., 2023)

- Use a **Consistent Grid Layout**: Implement a grid-based structure to align components evenly and maintain visual consistency.
- Establish an **Information Hierarchy**: Organize the dashboard content so that the most critical and high-level information is prominently displayed at the top or center.



4.2 USER INTERFACE

Method for Dashboard Design

Visual Design

MAKING THE DASHBOARD VISUALLY ATTRACTIVE AND EASY TO COMPREHEND (BACH ET AL., 2023)

Consistent Category-Color Mapping

- Assign specific, unique colors to each category or data type.
- Maintain consistency across all visualizations on the dashboard.

Distinct Color Palette

- Utilize a qualitative color palette with distinct, easily distinguishable colors.
- Ensure clarity and differentiation for categorical data.

Interactive Highlights

- Implement a highlighting feature for selected data points or categories.
- Temporarily accentuate the chosen data while dimming others.

BASIC VISUALIZATION DESIGN



Categories:

- Monthly rent categorized as medium-low, medium, medium-high, low, high

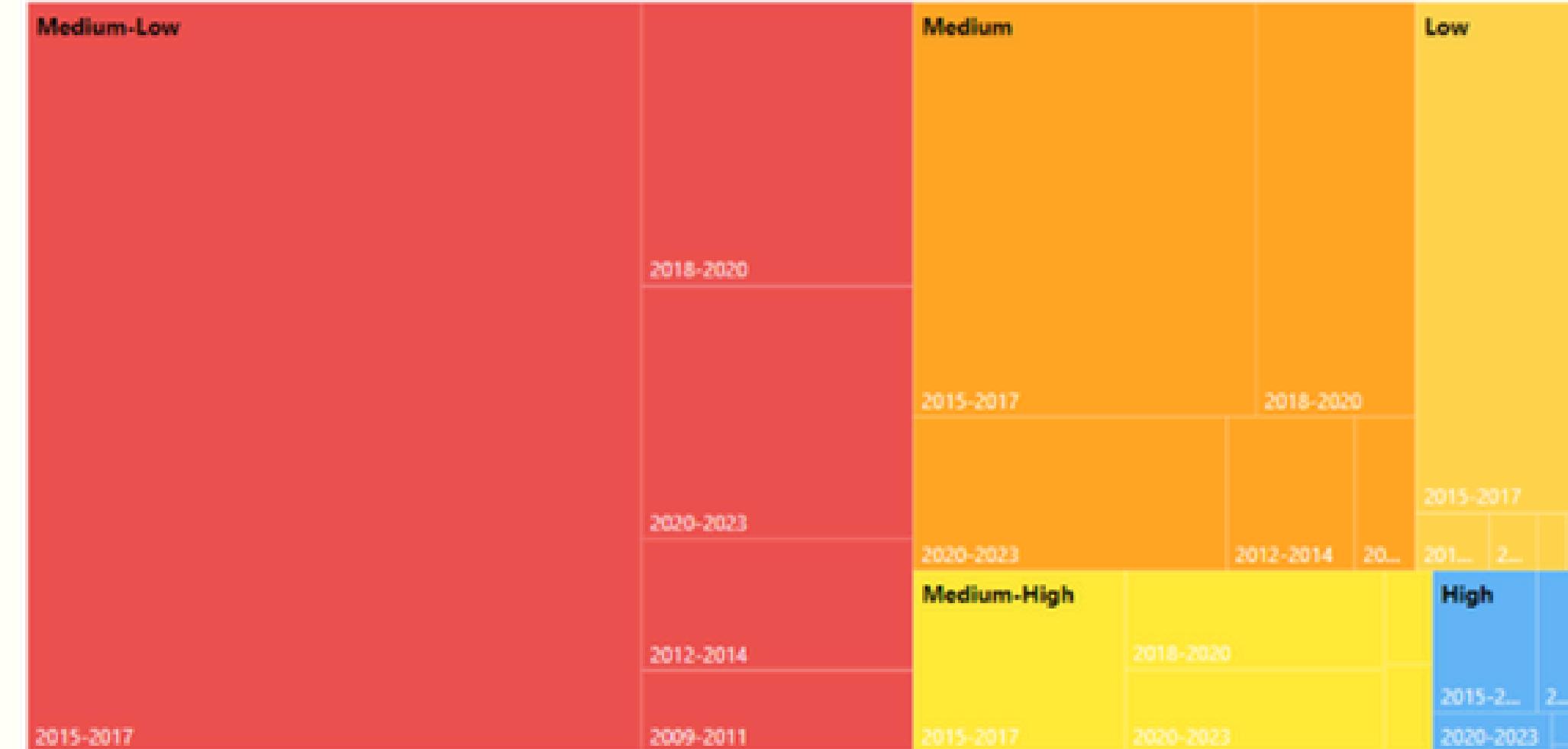
Values:

- Size of each rectangle represents the count of monthly rent of each category based on completion year
- Largest rectangle (left): Medium-low rent category has the highest count.
- Smaller rectangles (right): Gradual decrease in rent category counts.

Purpose: Highlights the distribution pattern of monthly rent across completion years.

Tree Map

Distribution of Monthly Rent by Completion Year



BASIC VISUALIZATION DESIGN



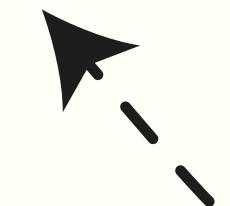
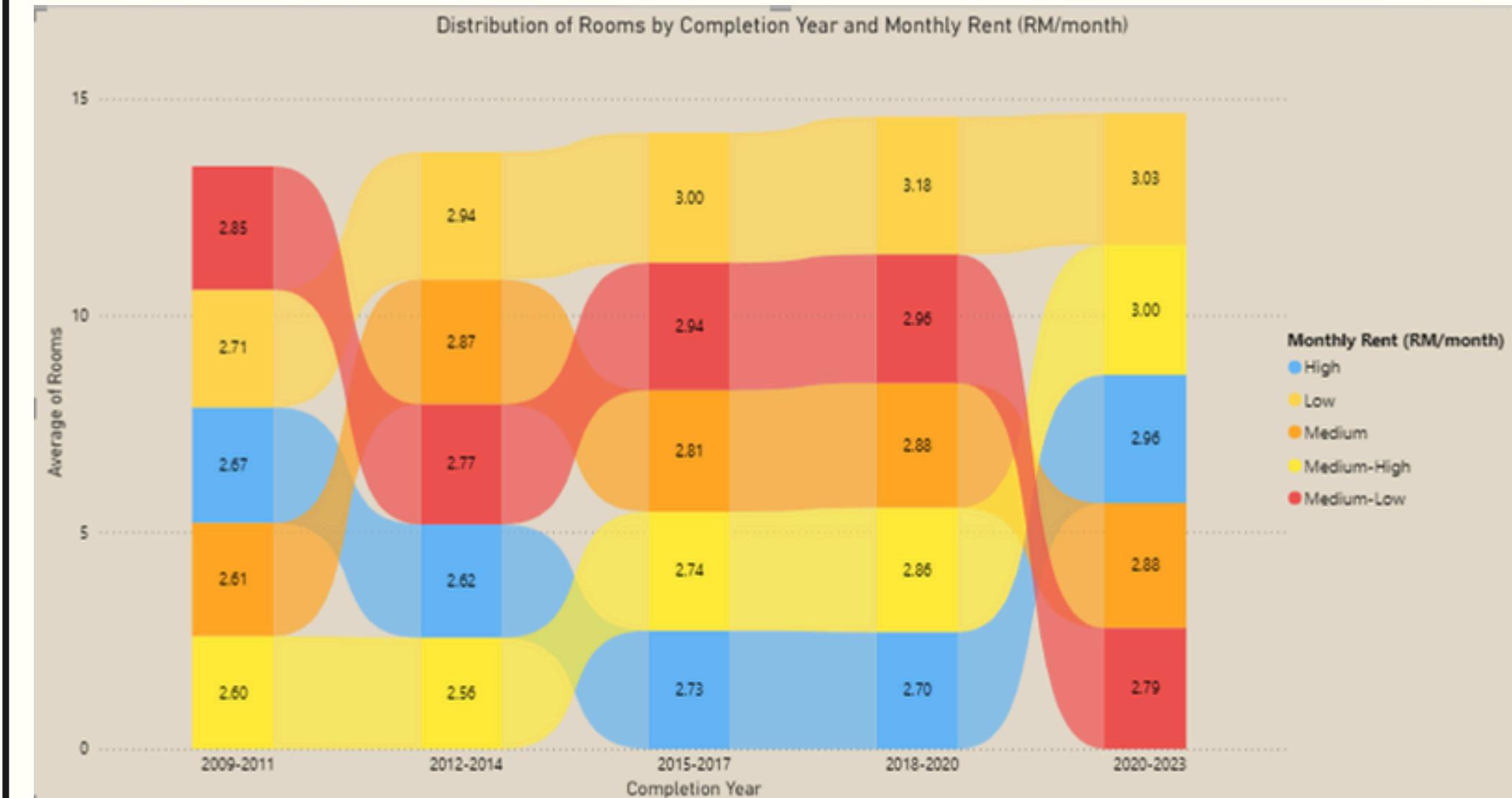
Rent Categories and Room Trends:

- Low Rent (Mustard Yellow): Average number of rooms increased from 2.71 (2009-2011) to 3.03 (2020-2023), peaking at 3.18 (2018-2020).
- Medium-Low (Red): Fluctuated, peaking at 2.96 (2018-2020) and dropping to 2.79 (2020-2023).
- Medium (Orange): Stable, increasing from 2.61 (2009-2011) to 2.88 (2018-2020).
- Medium-High (Yellow): Increased indicating growing size for mid-tier rent properties.

Highlight:

- Lower rent categories now offer larger living spaces over time.
- Medium categories show stability, balancing affordability and size.
- High rent properties show modest growth in room size, adapting to evolving market demands.

Ribbon Plot



BASIC VISUALIZATION DESIGN



Categories:

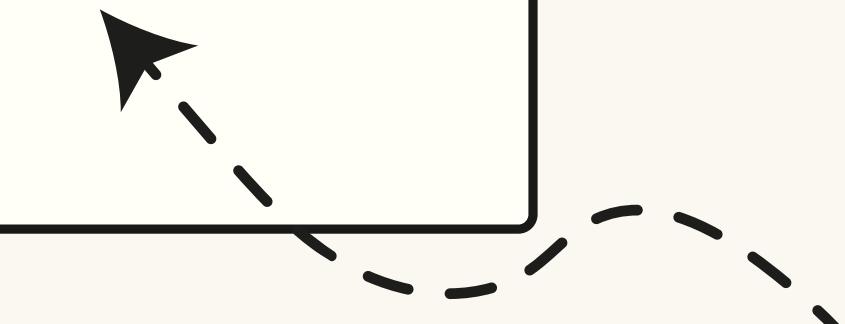
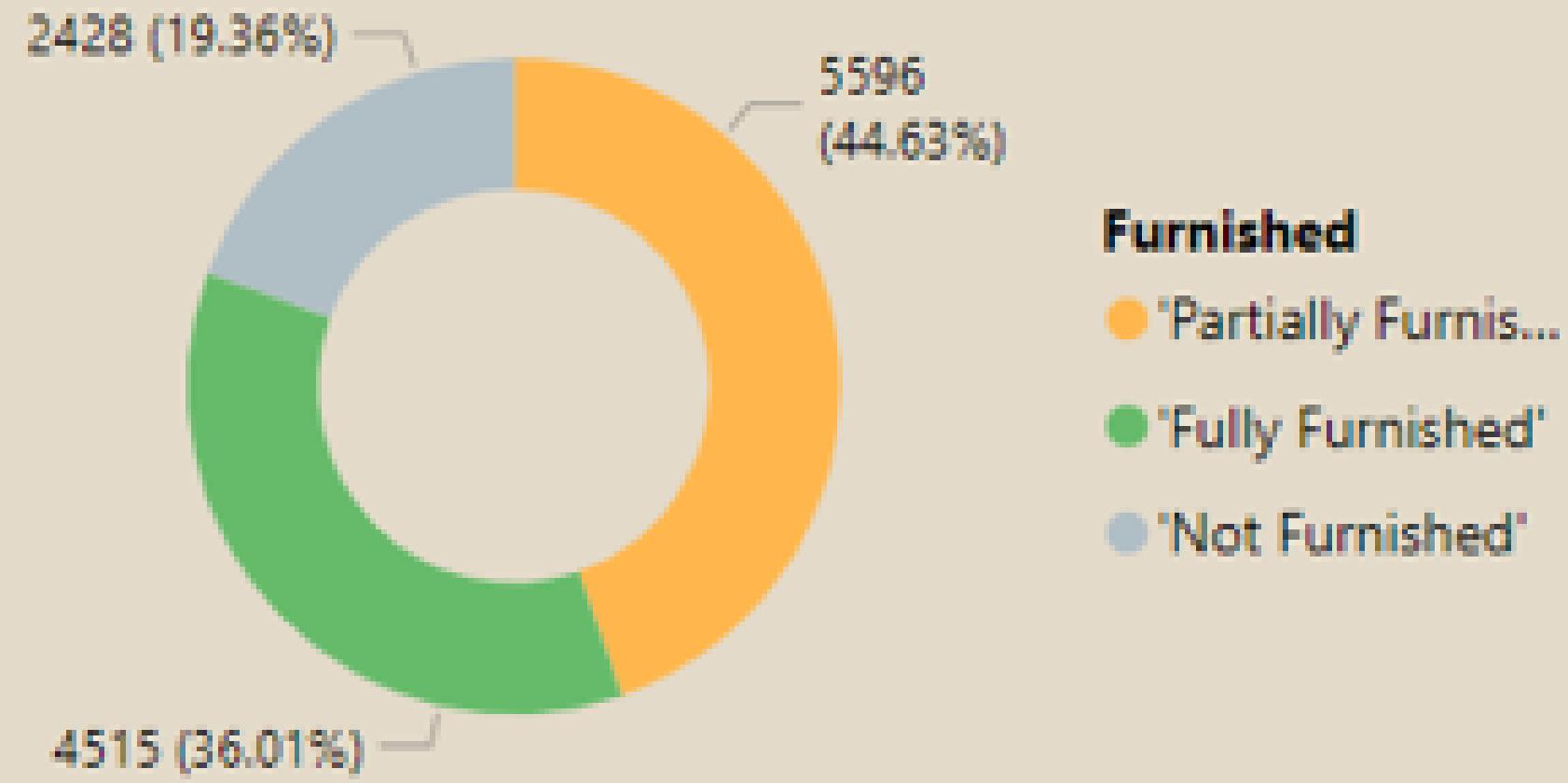
- Partially Furnished (Yellow): 44.63% (5,596) – Largest segment.
- Fully Furnished (Green): 36.01% (4,515).
- Not Furnished (Grey): 19.36% (2,428) – Smallest segment.

Key Insights:

- Partially Furnished properties are in highest demand, preferred for essential furniture with flexibility for customization.
- Not Furnished properties are in least demand, highlighting a preference for convenience and readiness.

Doughnut Chart

Rental Furnishing Distribution



BASIC VISUALIZATION DESIGN

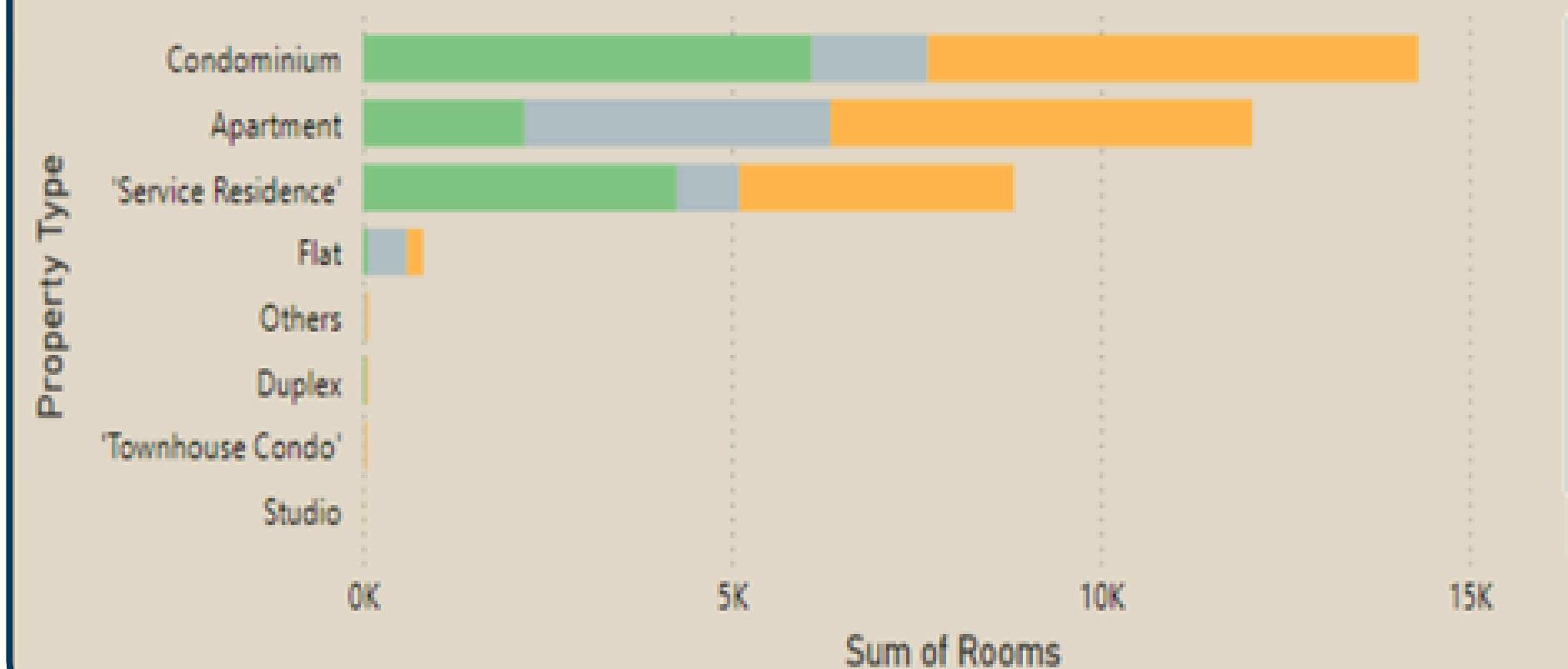


- "Partially Furnished" accommodations are the most popular furnishing type, especially in condominiums and serviced apartments.
- Condominiums , apartments and serviced residences dominate the overall room count in the market.
- "Not Furnished" rooms are the least preferred across all property types, particularly in smaller accommodations.
- Renters prioritize partially furnished accommodations, indicating that property furnishing plays a critical role in meeting market demand.
- Condominiums and apartments are key drivers of the rental market due to their popularity and availability.

Stacked Bar Chart

Distribution of Rooms by Property Type and Furnished Status

Furnished ● 'Fully Furnished' ● 'Not Furnished' ● 'Partially Furnished'



BASIC VISUALIZATION DESIGN



Affordability Focus:

- Medium-Low and Medium categories dominate, making up 76.5% of total properties.
- Reflects high demand for affordable rentals in the region.

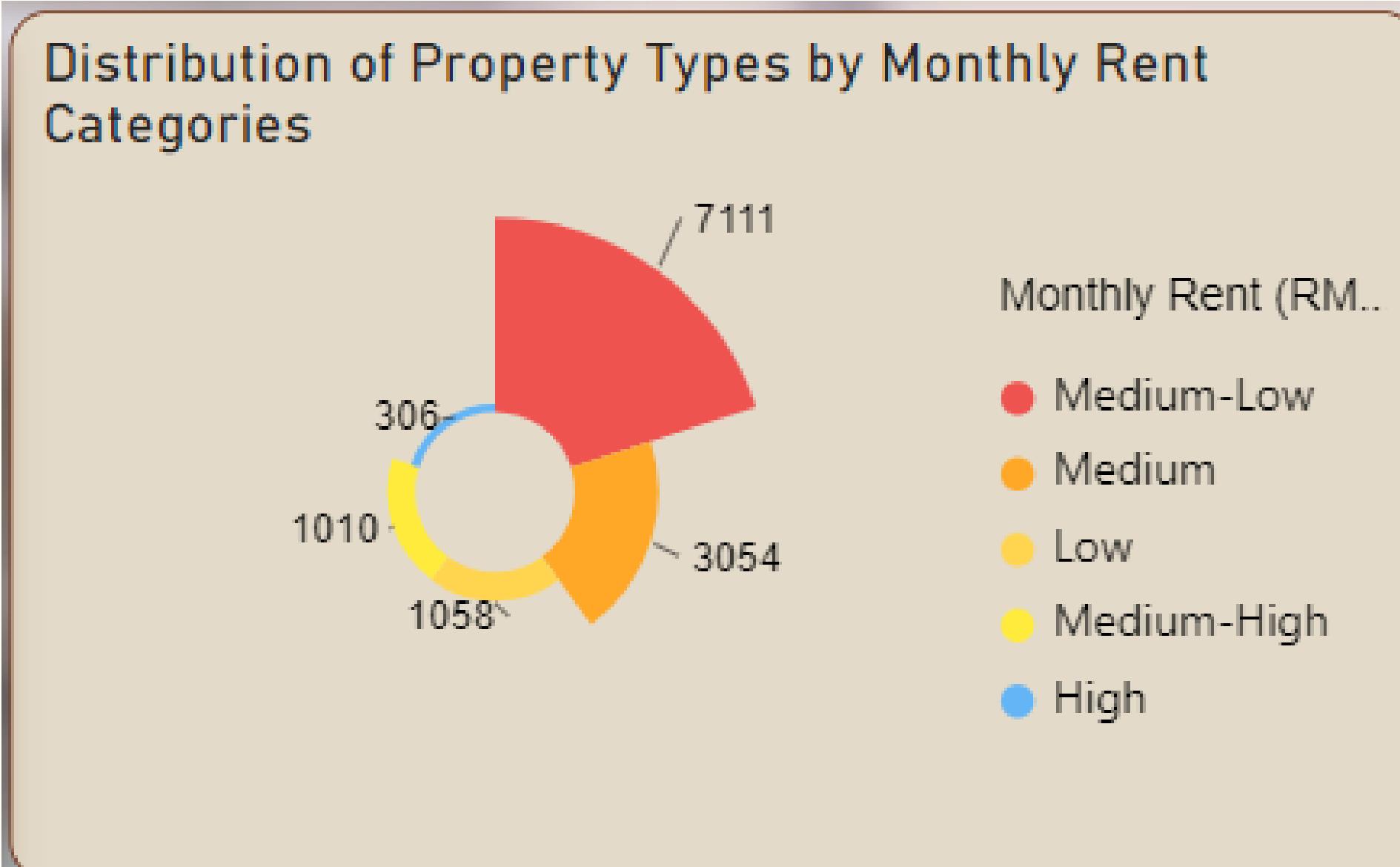
Limited High-End Options:

- Medium-High and High categories account for only 9.9%, indicating fewer premium properties available.

Market Trends:

- The distribution highlights rental affordability trends, aligned with economic realities and housing demand in Kuala Lumpur and Selangor.

Aster Plot

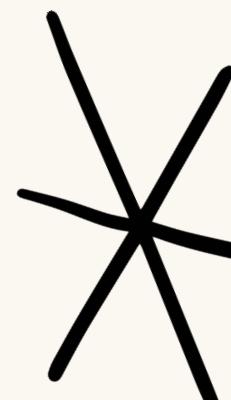


Analysis and Findings

CHAPTER 5

- 5.2 Research Question 1
- 5.3 Research Question 2
- 5.4 Research Question 3
- 5.5 Research Question 4
- 5.6 Research Question 5

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5.1 DATA STORYTELLING

Research Question 1: How does the completion year of properties influence their categorization into different monthly rent ranges?



Key insights:

(2018-2023) Newer Properties

- Fall into Medium-High and High rent categories.
- Higher demand: modern amenities, construction standards

(2015-2017) Mid-Range Properties

- Fall into Medium-Low rent category
- High demand, dominate rental market, affordable pricing + modern features

(2009-2014) Older Properties

- Fall into Medium-Low and Low rent categories.
- Less competitive, outdated features and reduced value over time

Data Highlights:

- 2018-2023: **High** rent categories due to modern and premium features.
- 2015-2017: **Mid-range** housing projects dominate with moderate pricing with decent features.
- 2009-2014: **Lower** rent categories due to outdated and aging infrastructure.
- **Strategic locations** property may increase demand from renters.

Conclusion:

Different completion year may provides different properties features (location, amenities) that could affect monthly rent ranges, with newer properties commanding higher rents and mid-range housing dominating the market.

5.2 DATA STORYTELLING

Research Question 2: How does properties average number of rooms and completion year in Kuala Lumpur and Selangor affect the Monthly Rent?

Key Insights:

High Rent Properties

- Generally smaller, starting at an average of 2.67 rooms in 2009–2011 and increasing to 2.96 by 2020–2023
- a demand for compact, luxury units.

Low Rent Properties

- Larger in size, beginning at 2.71 rooms and peaking at 3.03 rooms by 2020–2023
- appealing to lower-income tenants in suburban areas.

Medium Rent Properties

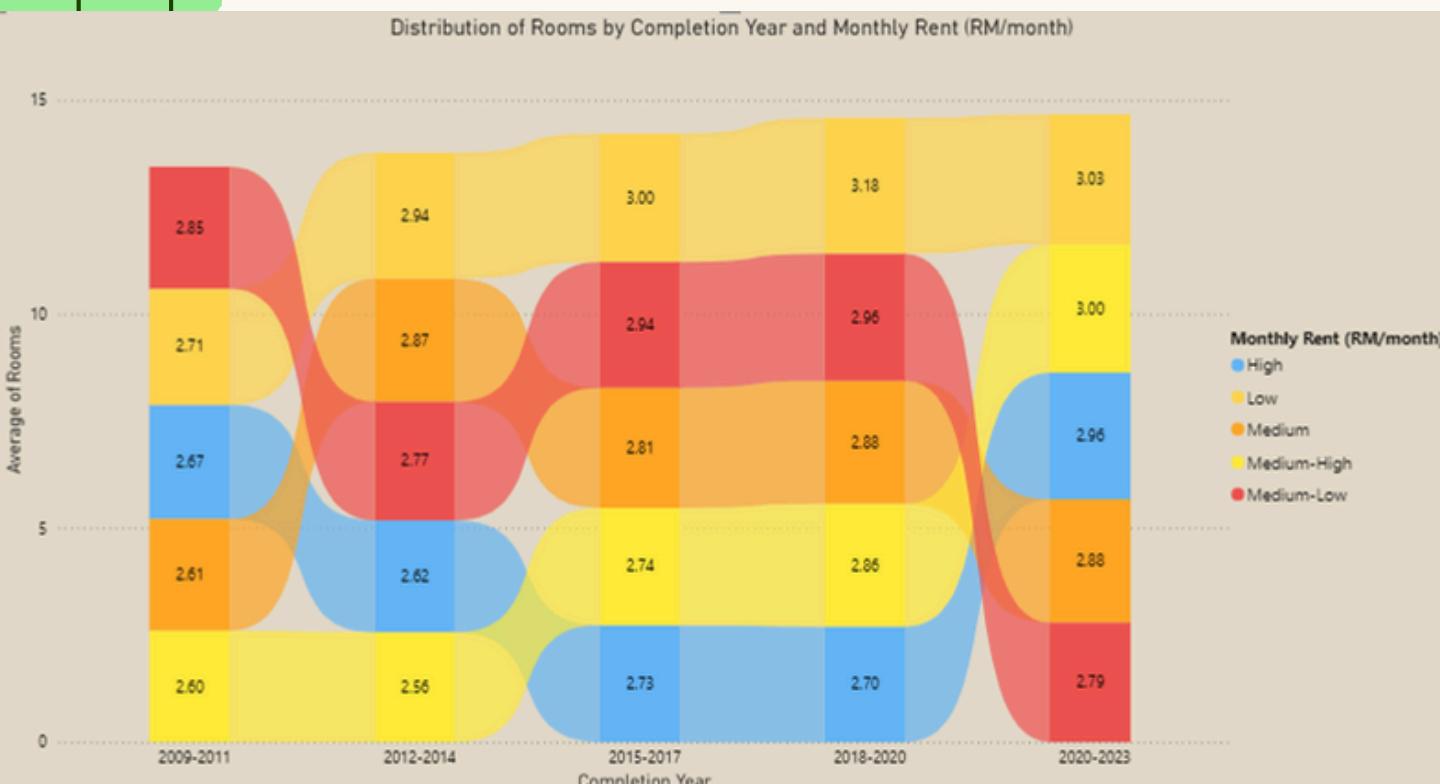
- Shows stability with room sizes increasing from 2.61 to 2.88 rooms over the same period
- targeting middle-income tenants.

Medium-High Rent Properties

- Demonstrates growth from 2.60 to 3.00 rooms,
- rising demand for moderately priced yet spacious properties.

Medium-Low Rent Properties

- Experiences fluctuations in room size, starting at 2.85 rooms, peaking at 2.96, and dropping to 2.79 by 2020–2023
- reflecting changing tenant preferences.



Data Highlights

- The average number of rooms for High Rent properties has shown a gradual increase over the years.
- Low Rent properties consistently offer larger room sizes compared to other categories.
- Medium and Medium-High Rent categories exhibit a consistent upward trend in room sizes.
- The Medium-Low Rent category's variability suggests a dynamic market influenced by diverse tenant needs.

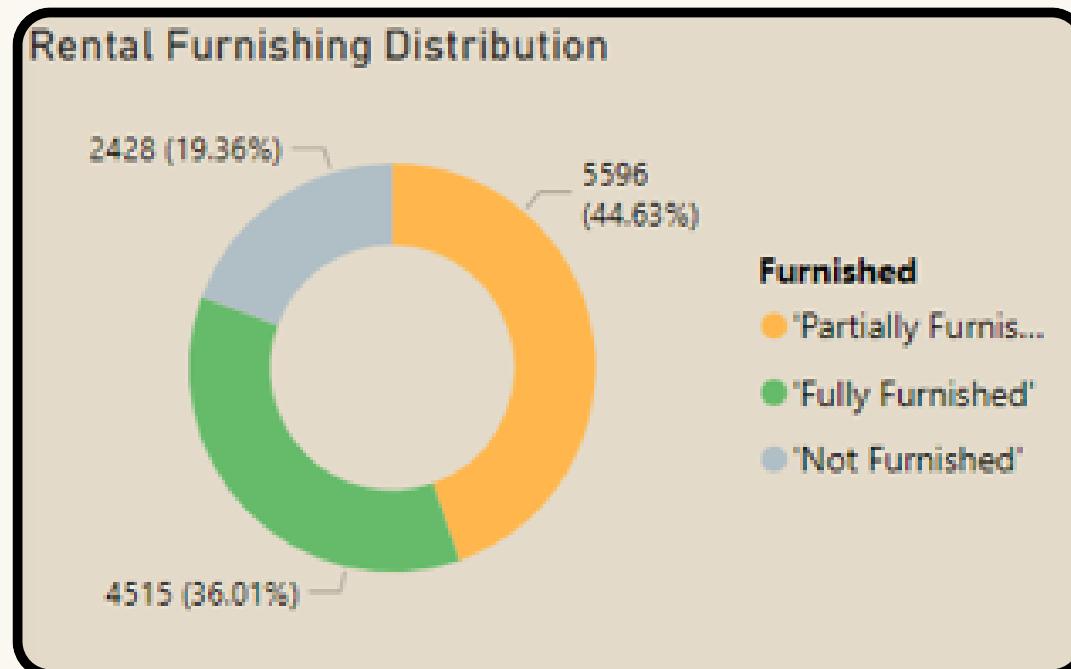
Conclusion

The analysis highlights a clear link between room size and rental pricing in Kuala Lumpur and Selangor. Smaller, premium properties in prime locations command higher rents, while larger homes cater to families or low-income tenants. Medium rent categories show stable demand for spacious, affordable homes, while fluctuations in Medium-Low Rent properties reflect changing tenant preferences.

5.3 DATA STORYTELLING



Research Question 3: What is the percentage of properties are fully furnished, partly furnished, or not furnished in Kuala Lumpur and Selangor?



Key Insights:

- The rental market in Kuala Lumpur and Selangor caters to diverse tenant needs with a focus on furnished properties.
- Partially Furnished** properties, offering a balance between essentials and customization, and attracting a broad range of tenants seeking flexibility without sacrificing key furnishings.
- Fully Furnished** properties target tenants that seeking convenience, particularly professionals, students, and short-term renters.
- Not Furnished** properties cater to renters that prioritizing affordability and creative control over their living space.



Data Highlights:

- Partially Furnished: Represents **44.63%** of the market.
- Fully Furnished: Accounts for **36.01%** of properties.
- Unfurnished: Comprises **19.36%** of the market

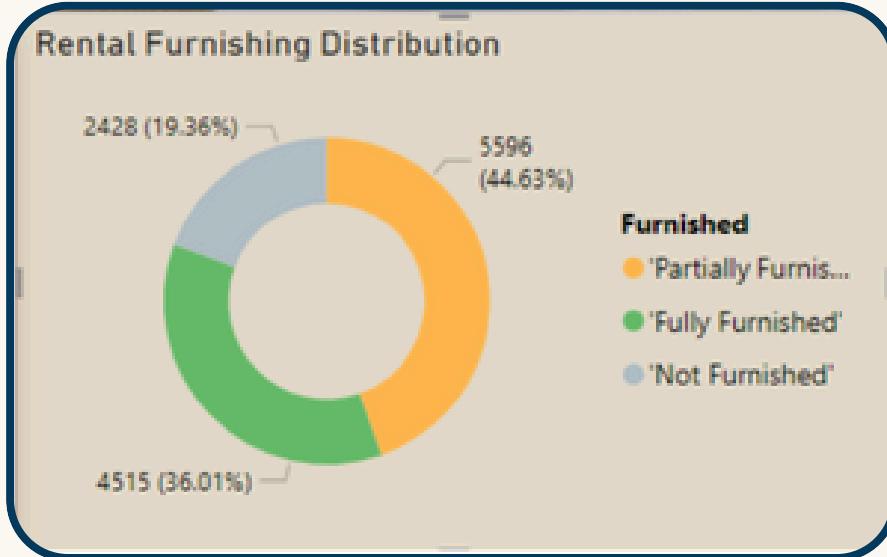


Conclusion:

- The rental market in Kuala Lumpur and Selangor is largely dominated by furnished properties, with over **80%** falling into the fully or partially furnished categories. This flexibility meets the diverse needs of tenants, offering a balance of affordability, convenience, and customization.

5.4 DATA STORYTELLING

Research Question 4: How do furnishing options change for different property types in Kuala Lumpur and Selangor?



Key insights:

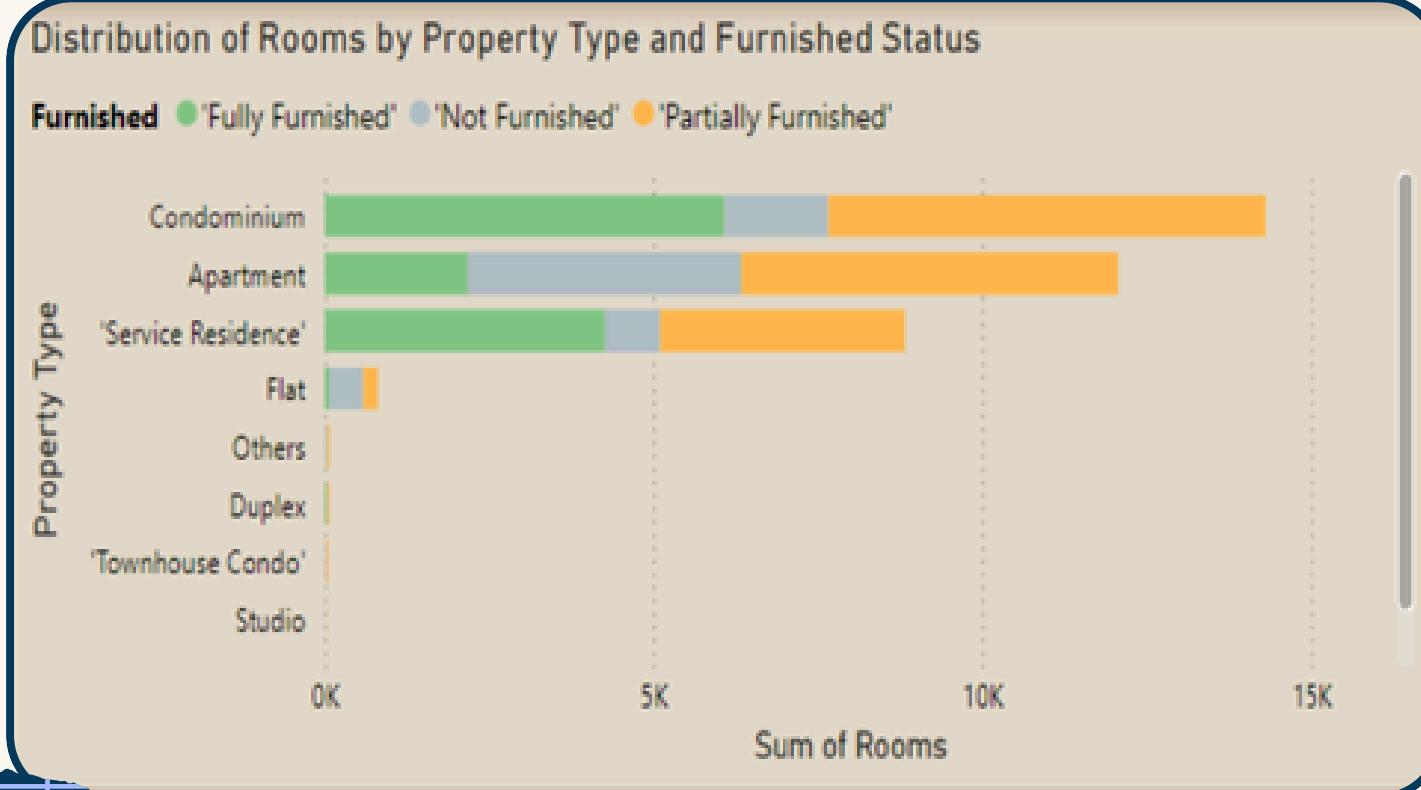
- More tenants prefer **partially furnished properties** over fully furnished or unfurnished options.
- High-end properties like condominiums predominantly offer **partially furnished** units, while service residences focus on **fully furnished** options.
- Apartments provide a balanced mix of **partially furnished** and unfurnished options, appealing to a broader tenant base.
- Flats and low-cost housing prioritize affordability with a higher share of **unfurnished** units.
- Studios and duplexes are often **furnished**, catering to young professionals and expats.

Data Highlights:

- 44.63%** of rental properties are **partially furnished**.
- 36.01%** of properties are **fully furnished**.
- 19.36%** of properties are **unfurnished**.
- High-end properties (e.g., condominiums) are mostly partially furnished.
- Flats and low-cost housing have the highest share of unfurnished units.
- Studios and duplexes are primarily furnished, catering to niche markets like young professionals and expats.

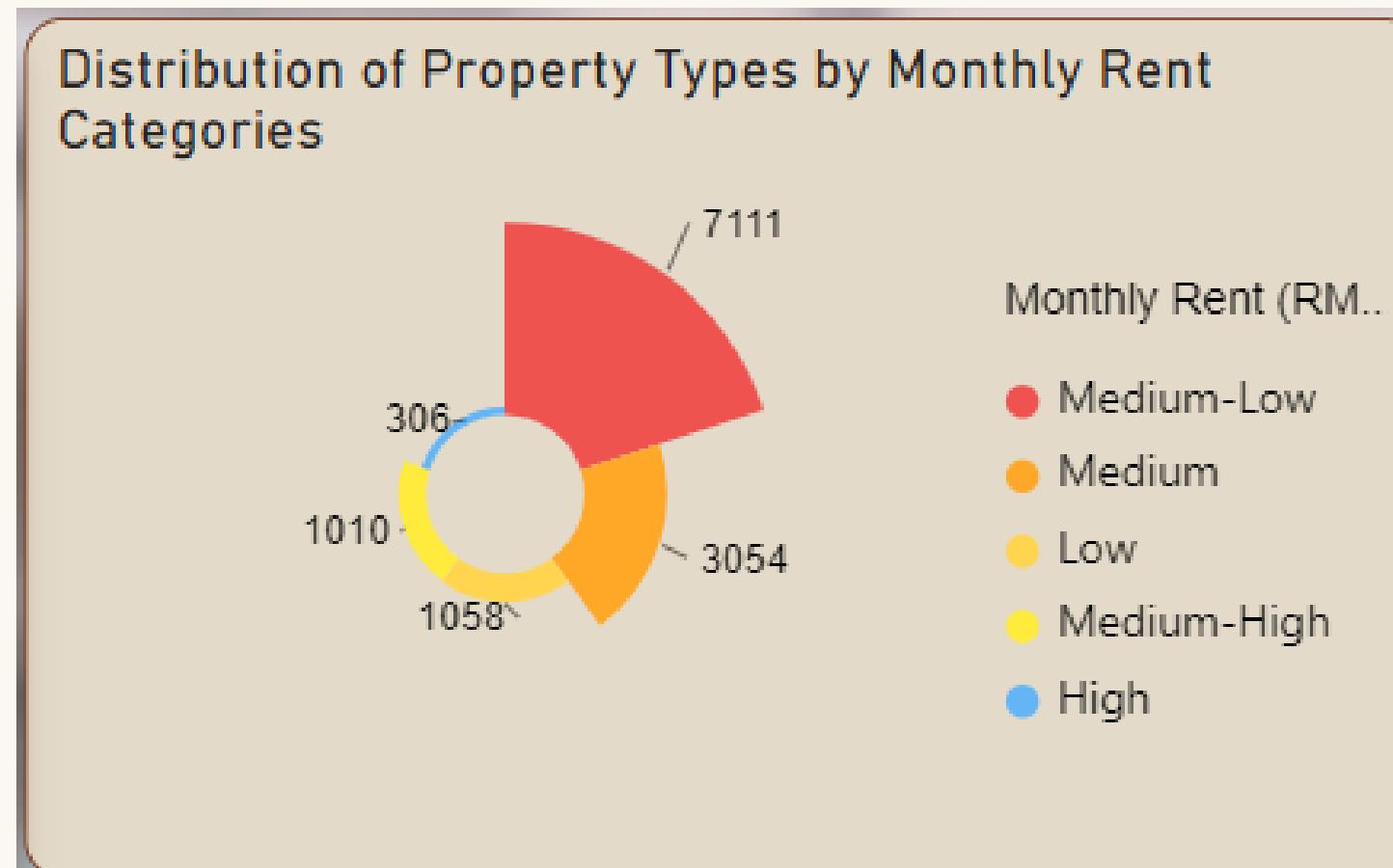
Conclusion:

Furnishing preferences vary by property type, with high-end properties offering more partially furnished options, while affordable housing emphasizes cost savings with unfurnished units. Tailoring rental options to tenant needs is key in Kuala Lumpur and Selangor.



5.5 DATA STORYTELLING

Research Question 5: What do the rental price ranges show about the affordability of properties in Kuala Lumpur and Selangor?



Key Insight:

- The rental market in Kuala Lumpur and Selangor is primarily focused on **affordability**, with most properties catering to low- and middle-income renters.
- "**Medium-Low**" (7,111 units) and "**Medium**" (3,054 units) rent categories dominate, providing a wide range of accessible options.
- Premium segments ("**Medium-High**" and "**High**") are limited, with only 1,010 and 306 units, indicating a smaller focus on higher-end rentals.



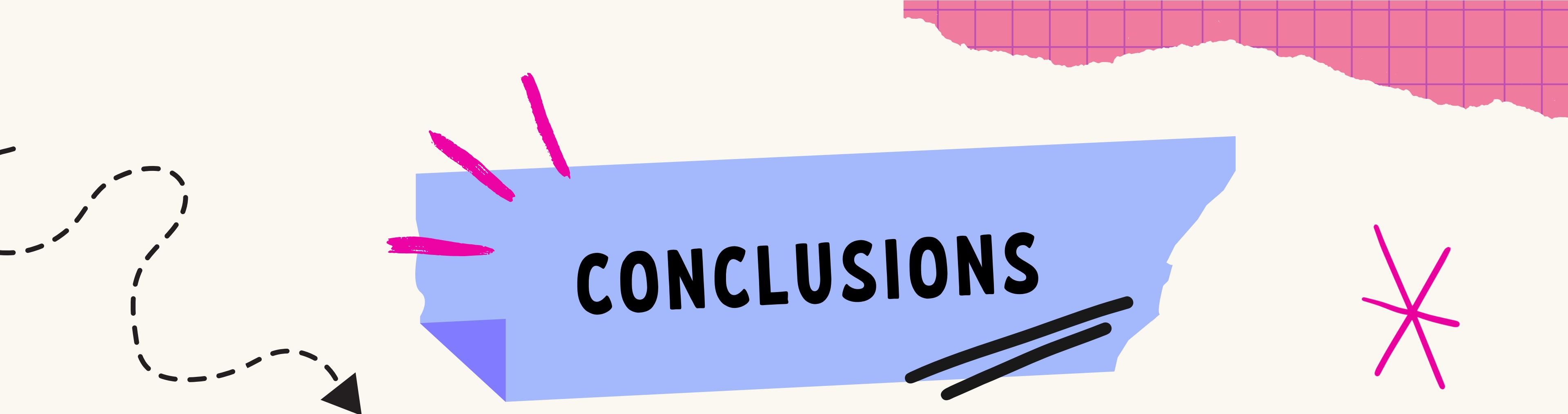
Data Highlights:

- Affordable Options:** Majority of properties fall within budget-friendly categories.
- Limited Premium Supply:** High-end rentals make up a small market share.
- Market Focus:** Emphasis on meeting the needs of renters with moderate budgets.



Conclusion:

- The rental market effectively supports affordability, benefiting low- and middle-income groups, but has limited premium housing options.



CONCLUSIONS

CONCLUSION 1

Furnishing Status: Most rental homes are partially furnished, making them suitable for many tenants. Fully furnished and unfurnished options are available for those on a budget.

CONCLUSION 2

Completion Year & Rental Trends: Older properties (before 2015) are more affordable, while newer ones have higher rental prices, attracting different groups of renters.

CONCLUSION 3

Balanced Development: Increasing affordable rental homes and partially furnished options can help more people find housing that suits their needs.

THANK YOU!

MAAF JIKA PRESENTATION KAMI KURANG SEMPURNA,
KERANA YANG SEMPURNA ITU HANYALAH KITA BERDUA
YANG PERNAH BERSAMA :')