

REPORT RENTAL HOUSE

PREFACE

The analysis of rental prices in Malaysia is grounded in the methodological rigor of the Consumer Price Index (CPI), which adheres to international standards such as the United Nations' COICOP framework (notably Division 04, covering actual rentals and imputed rents for owner-occupied housing) and the IMF's Consumer Price Index Manual: Concepts and Methods (2020), which emphasizes rental equivalence and excludes capital costs like mortgage principal repayments. Rental price influences, such as urbanization rates, housing demand-supply imbalances, regional economic disparities (reflecting the IMF's guidance on spatial stratification), and COICOP's distinction between recurring housing costs versus excluded capital investments. This recalibration ensures the framework not only mirrors international standards for housing consumption measurement but also accurately reflects Malaysia's evolving rental landscape.

Effective monitoring of rental price trends demands robust data integration, a cornerstone of DOSM's analytical approach. Creating a reporting dashboard enables a more robust analysis by enabling granular insights into spatial variations, long-term affordability challenges, and market volatility. By highlighting regional discrepancies—such as urban-rural divides or state-specific rental inflation—the dashboard equips policymakers, real estate stakeholders, and researchers to address housing inequities and formulate evidence-driven strategies. This systematic approach underscores the critical role of timely, transparent data in fostering equitable housing policies and stabilizing rental markets amid economic uncertainties.

This project tackles challenges in data standardization by aligning item categorization with the DOSM's CPI framework. This reduces inconsistencies, enhances dataset reliability, and facilitates more accurate metric evaluations. Its real-time data collection and monthly updates strengthen tools for monitoring price changes and conducting economic analyses.

These initiatives collectively underscore the importance of integrating data, improving quality, and using advanced methodologies to generate actionable insights. They enhance understanding of rental price trends, support informed decision-making, and promote effective governance and consumer protection across the rental property markets. This process will serve as a framework for the next project, utilizing advanced technologies and updated data collection methods to ensure precise and timely insights into price trends.

All analysis in this report is intended solely for internal study within the Department of Statistics Malaysia (DOSM). The findings and interpretations presented reflect the results of team discussions and collaborative efforts. It is important to note that these outcomes may not represent the consensus or official stand of DOSM as a whole.

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1. Introduction

1.1 Introduction

The rental housing market in Malaysia is showing signs of recovery, with a notable acceleration in rental growth rates for the first time in a year. According to the Malaysia Home Rental Index for 2Q2024 by IQI Malaysia, residential rents increased by 3.9% quarter-on-quarter (q-o-q) and 2.9% year-on-year (y-o-y), reaching an average of RM1,995. This growth surpassed earlier forecasts, prompting an upward revision of projections for 1Q2025 to a 5.5% annual increase (The Edge Malaysia, 2024).

The National Property Information Centre (NAPIC) in Malaysia plays a crucial role in providing comprehensive property market data which is vital for decision-making across various sectors. However, improving the timeliness of its reporting processes is essential to address delays that can impact the relevance of market analyses. Embracing modern tools like Robotic Process Automation (RPA) and real-time analytics can empower NAPIC to deliver faster and precise insights. These advancements would not only enhance the understanding of rental price trends but also support better housing policies, encourage informed investments, and contribute to a more resilient property market.

Due to the limitations, the Rental House Price Surveillance leverages RPA to enhance data collection and classification in compliance with Consumer Price Index (CPI) standards. This approach enables a more efficient analysis of the rental market in Malaysia, providing a comprehensive and accurate overview of prevailing price trends.

1.2 Objective of the study

The main purpose of this study is to analyze rental market trends in Malaysia by examining various factors. Therefore, to achieve this goal, several objectives have been developed to ensure comprehensive insights are obtained. The objectives are:

- i) To analyze a general overview of rental market prices in Malaysia.
- ii) To identify states and districts with a notably high average asking rental prices.

1.3 Scope and Limitations

This report focused on analyzing the current rental market in Malaysia using data collected through web scraping from online property listing websites. The analysis looked at rental market trends from July to December 2024, focusing on the average rent prices by state and district in Malaysia. It also examined the price ranges for different property types to understand their affordability. Additionally, the report investigated whether there were large differences in rent prices between states and property types, providing a clearer picture of the rental market.

Due to the nature of web-scraped data, relying on the number of listings as an indicator of daily averages is unsuitable, primarily due to potential issues with data integrity and duplication. As a result, the analysis is constrained to a monthly scale, as the variability and consistency required for daily or weekly insights cannot be reliably maintained in this dataset. Other than that, certain websites provide information on facilities, such as gym availability or nearby hospitals, while others do not. Consequently,

the analysis is limited in scope, focusing solely on the physical characteristics of the properties and rental prices, as facility data is inconsistent across sources.

2. Literature Review

2.1 Introduction

Extensive research has been undertaken to investigate rental properties in areas of interest. This research has focused on the methods of data collection employed and the specific types of data gathered about these properties.

2.2 Data Collection Methods

There are two types of methods in online data collection that had been used by previous researchers, mainly manual and automatic types of data collection.

Hoekstra et al. (2010) employed a traditional manual method where trained statisticians visited websites, identified relevant data, and manually transcribed it into a database. Statistics of the Netherlands currently utilizes this method to gather price information for items included in the CPI. However, this approach is labor-intensive and limits the frequency and scope of data collection.

In contrast, automated data collection methods, often referred to as internet robots, web crawlers, web scrapers, or bots, involve software programs that automatically browse the internet and extract specific information from websites. These automated methods offer several advantages over manual collection, including higher efficiency, greater frequency, a broader scope of data collection, and the ability to gather data from new sources that were previously inaccessible through manual methods.

Web scraper is the most popular automation tool for collecting data on rental properties and involves using software to extract data from websites. Here is how the web scraping process is typically done;

1. Identify the website to scrape from, researchers will first identify what website that contain the desired rental property listings,
2. Development of web scraper, they will then develop or use existing web scraping tools that's either can be written in programming language such as Python, or other commercial web scraping software,
3. Parsing HTML (Hypertext Markup Language), which is code that structures and display content on websites, whereby the web scrapers fetching the data from,\
4. Extracting data using XPath (XML Path Language), to locate and extract specific data elements from the HTML code. XPath is a query language used to navigate through the hierarchical structure of an XML or HTML document. It allows researchers to pinpoint the exact locations of data points like price, address, number of bedrooms, or any other information displayed on the webpage.
5. Utilizing XPath (XML Path Language), researchers can extract precise data elements from the HTML code of a webpage. XPath functions as a query language that enables navigation through the hierarchical structure of an XML or HTML

document. It empowers users to pinpoint the specific locations of data points such as prices, addresses, the number of bedrooms, or any other information displayed on the webpage,

6. Data structuring and storing, the extracted data will be then organized into a structured format, often using spreadsheets or databases, and the most common data formats is using comma-separated values (CSV) excel files and SQL databases.

2.3 Type of Data Collected

Researchers categorize collected rental property data into several groups: property information, location information, and listing and interaction dates. Additional considerations include rent levels and trends, affordability, market segmentation and submarkets, and factors influencing rental prices through hedonic modeling and discriminatory practices.

Property information typically comprises details about the property itself, including price, type, size, amenities, advertising availability, floor level, energy efficiency rating, and furnished status.

Location information primarily consists of the property's address and postcode, geographic coordinates for mapping and spatial analysis, proximity to amenities and services, and neighborhood characteristics such as average income and crime rates.

Listing and interaction data encompass information related to the online advertisement, such as listing dates (creation, modification, and removal), listing views (indicating demand), listing source (real estate agency or private landlord), and visual information (number of pictures or image content, requiring sophisticated analysis techniques).

2.4 Articles and News Discussing on the Rental Properties

There are several articles and news articles discussing the causes and effects of rental properties. Peachey (2024), from BBC News discusses about having a limited supply in rental properties in the United Kingdom drives up competition for tenants to find places to rent, its reflected on the rental properties website, Zoopla that some rental properties, especially two-bedroom homes, are listed down to 25 days on average, which is 10 days fewer than pre-pandemic. But shorter average listings can also occur in some regions, like in North West England and Scotland.

The economic pressure of finding and renting properties also affected the supply and prices of the properties, with high property prices and mortgage rates preventing people from buying houses, increasing the demand for rental properties. But at the same time, it drives up the rent prices, forcing younger people to stay longer in their parents house due to the financial pressure.

With the decreasing supply of properties also affecting the prices of rental, as noticed by the surveys conducted by the National Residential Landlords Association

shows that many landlords are planning to sell properties, which will cause the rental stock to further decrease.

Curphey (2024), from the Relocate Global Magazine also echoing the same problem that rental properties have an effect in Europe. Housing shortages still occur even in major cities in Europe such as Berlin, Amsterdam and Lisbon, caused by limited housing supply and high demand driven by relocating professionals, tourism, and population growth. This in turn causes a rise in rental costs in urban areas and with increased competition among tenants, available properties often rented out within hours of listing.

Government policies also in a way affecting the supply and prices of rental properties, with higher Capital Gains Tax (CGT) imposed on the landlords discourage them from investing into long-term properties, causing them to sell, reduces the rental stocks and eventually driving up prices for the already limited rental properties. Stamp Duty on Second Homes increases for buy-to-let or second homes, causing it even more costlier for landlords to enter the rental market.

Other policies that impact landlords on acquiring or maintaining rental properties include mortgage relief rules, which is phasing out or limiting mortgage interest tax relief for landlords, increases their operating, and will often pass onto tenants as higher rents. As well as stricter energy efficiency standards and regulations, will cause upgrade costs

to rise up, and failing to comply with the regulation and standards, will cost the property to exit the market.

But some policies also impacted tenants, such as Rent Control Laws, which design for short-term affordability by putting caps on rent prices or freeze the limit of how much landlords can charge or increase rent. This way often discourages investment in rental properties, reducing supply over time.

Even though the government may protect the tenants by introducing stronger tenant rights, such as extended eviction notice periods or limits on security deposits, it'll protect the renters but can reduce landlord willingness to lease properties.

BERNAMA (2024) states that The upward trend in rental prices in Malaysia is driven by various factors. Mainly, the dynamic of supply and demand plays a significant role, with increased demand putting upward pressure on prices. Seasonal shifts in the rental market also contribute, likely corresponding with the beginning of academic years or other cyclical movements. The influx of international students needing accommodation further intensifies demand, as does the involvement of investors in the rental market, which can influence pricing strategies. While not explicitly detailed, underlying economic growth also likely plays a role by indirectly increasing the demand.

The primary effect of these price increases is a higher cost of living for renters, with the national average rental price now at RM1,995. This increase is not uniform; Kuala Lumpur faces the brunt of these changes, experiencing significantly higher average rental rates and the strongest rental growth compared to the rest of the country. Consequently, families might find themselves having to seek more affordable housing options or adjust their budgets significantly to maintain their disposable income. This also leads to geographical disparities, with areas like Selangor experiencing more moderate increases compared to Kuala Lumpur. While the current trends show an increase, it is not a temporary issue, as the prediction suggests a continued upward trend with a projected 5.5% annual increase by the first quarter of 2025. Interestingly, despite rental increases, gross rental yields for investors have remained stable, indicating comparable returns for investors.

Amri (2024) states that the rising costs of housing and rental rates in the Klang Valley are causing significant concern, particularly among young professionals who are just starting their careers. Last year was projected to see a substantial 9.95% increase in housing prices and a 9.57% rise in rental rates, with Kuala Lumpur and Selangor expected to experience even higher increases of 9.7% and 9.9% respectively. This sharp escalation disproportionately impacts young individuals who often start with lower salaries, making it increasingly difficult to secure adequate housing. Consequently, a large portion of their income is consumed by housing costs, leaving limited resources for other essentials like food, transportation, and daily necessities, creating financial strain and instability. This situation leads many to rent, where increased costs further restrict options. This highlights

a critical need for government intervention to address these challenges through incentives, financial aid, and more affordable housing initiatives, such as the "Rumah Rahmah" program. Moreover, there's a call for new policies designed specifically to assist new graduates in obtaining suitable housing. Many young people also express a preference for renting over buying, due to a lack of ability to secure loans or long-term financial stability. The escalating cost of housing not only creates financial instability for individuals but also negatively impacts the broader community and overall quality of life. Essentially, the article underscores the plight of young professionals in Kuala Lumpur who are struggling with the financial burden imposed by the rapidly increasing costs of housing.

3. Methodology

3.1 Rental Analysis Workflow

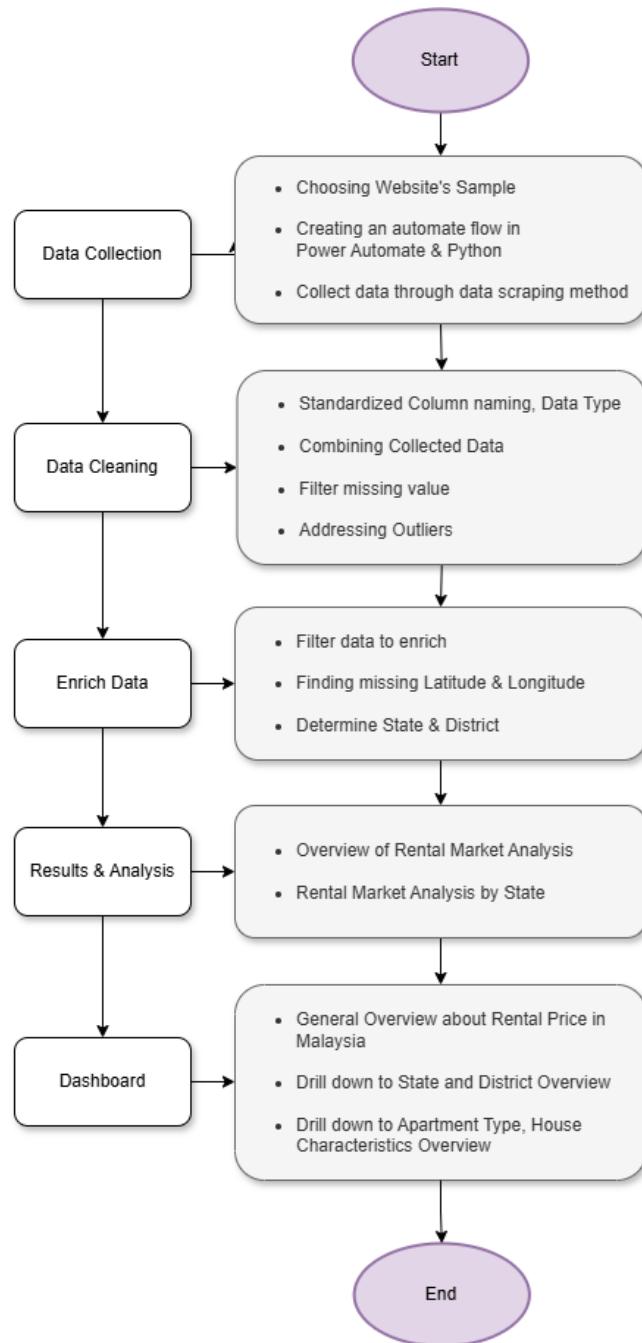


Figure 1 : Rental Analysis Flow Chart

3.2 Data Collection Methods

3.2.1 Sample Selection of Online Rental Websites

The primary data source for this project consists of online rental websites in Malaysia, encompassing over 10 platforms that advertise various types of properties and their characteristics. As illustrated in Figure 1, these are some of the most popular rental websites in Malaysia. A sample of data will be selected from chosen websites, as some platforms lack the specific attributes required for this analysis.

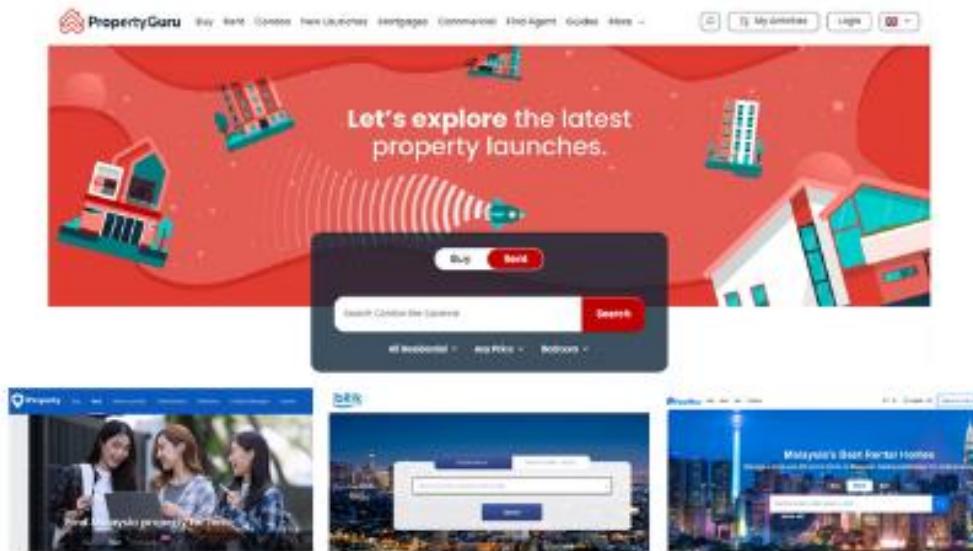


Figure 2: Compilation of Online Rental Websites available in Malaysia

Table 1: Characteristics of the data

Name of the variable	Data Type of the Variable	Description
Posted Date	Date	Date when the property advert is posted in the platform
Property Type	Qualitative	Type of property listed in the platform
Rent Price	Quantitative	Price of rent based on the day it is posted
Number of Bedroom	Quantitative	Number of bedrooms in the listed property
Size of the Property	Quantitative	Area of the property (exclude the land)
Number of Bathroom	Quantitative	Number of bathrooms in the listed property
Furnishing Type	Qualitative	Type of furnishing in the listed property
Latitude	Quantitative	Latitude's location of the property
Longitude	Quantitative	Longitude's location of the property
State	Qualitative	State of the property
District	Qualitative	District of the property

Various online rental websites in Malaysia were evaluated based on data availability and specific requirements essential for data collection. Key criteria included the absence of ads or CAPTCHA, allowing for seamless data crawling, and the capability to display over 250 listings per month, among others. Additionally, each selected website needed to provide crucial information and detailed property descriptions, as outlined in Table 1 above. Following this evaluation, four websites which were Landprop, Mudah.my, DurianProperty, and iProperty were deemed suitable as the primary platforms for data crawling in this project.

3.2.2 Data Crawling

For the main data collection phase, a technique called Data Crawling/Scraping was employed to extract the required information from online rental website samples. This approach facilitated faster and continuous data collection, utilizing tools like Power Automate Desktop and Python programming to enhance the efficiency and accuracy of the process. Below is the flowchart illustrating the project's data collection process. It provides a visual representation of the steps involved in utilizing Data Crawling/Scraping techniques, along with the use of Power Automate Desktop and Python programming to extract data from online rental website samples efficiently.

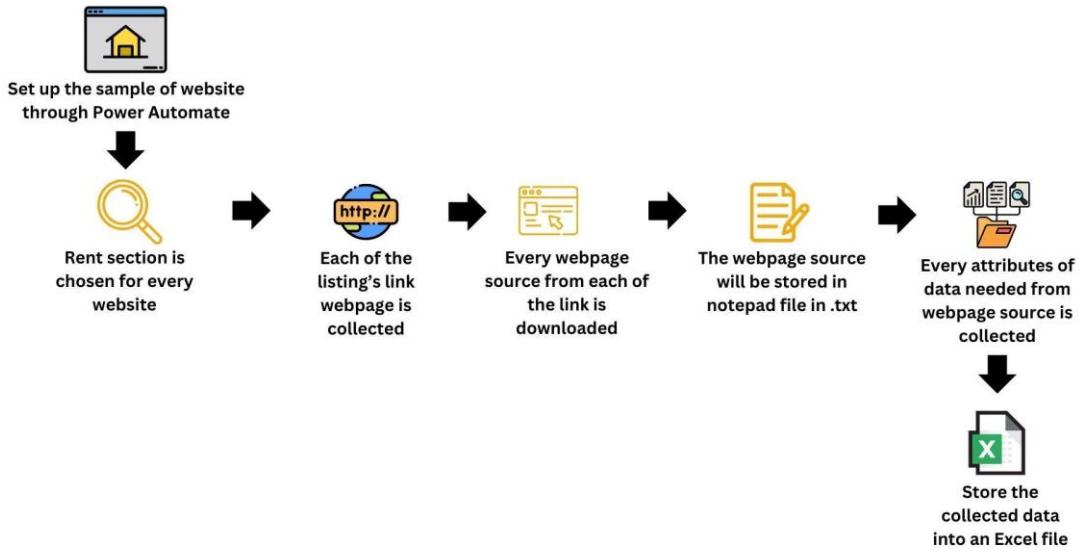


Figure 3: Flow Diagram of Data Crawling process

By leveraging Power Automate Desktop, the system is configured to automatically open the selected website samples and navigate to the rent section to initiate the data collection process. Once the website is directed to the rent section, the data crawling process begins, during which the system collects all the links to rental advertisements available on that day, with most of the data displaying listings for a three-month period. Typically, the header of each link contains the URL that directs the user to the specific rental advertisement page. After gathering all these links, the data is stored in an Excel spreadsheet, as illustrated in Figure 3.



Figure 4: Process of link of each advert is collected

The links stored in the Excel file are then used to access each individual advertisement, with the main objective of downloading the web page for every available listing. This process requires the system to repeatedly open each advertisement through the links in the Excel file, using if-else statements to prevent any errors during the operation.

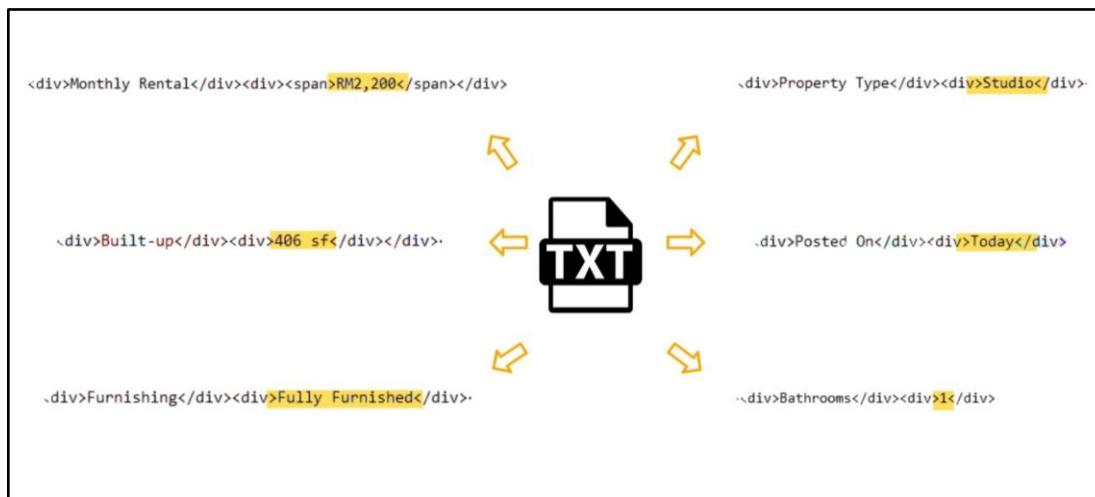


Figure 5: Example of data extracted from the web page source

The process continues by extracting the property characteristics from each advertisement through the downloaded web pages. Information such as rent price, property type, and other relevant details is collected and recorded in an Excel file. The webpage source provides a comprehensive view of all these elements, with each attribute representing different types of data, ensuring that all relevant information is systematically captured.

3.3 Data Cleaning

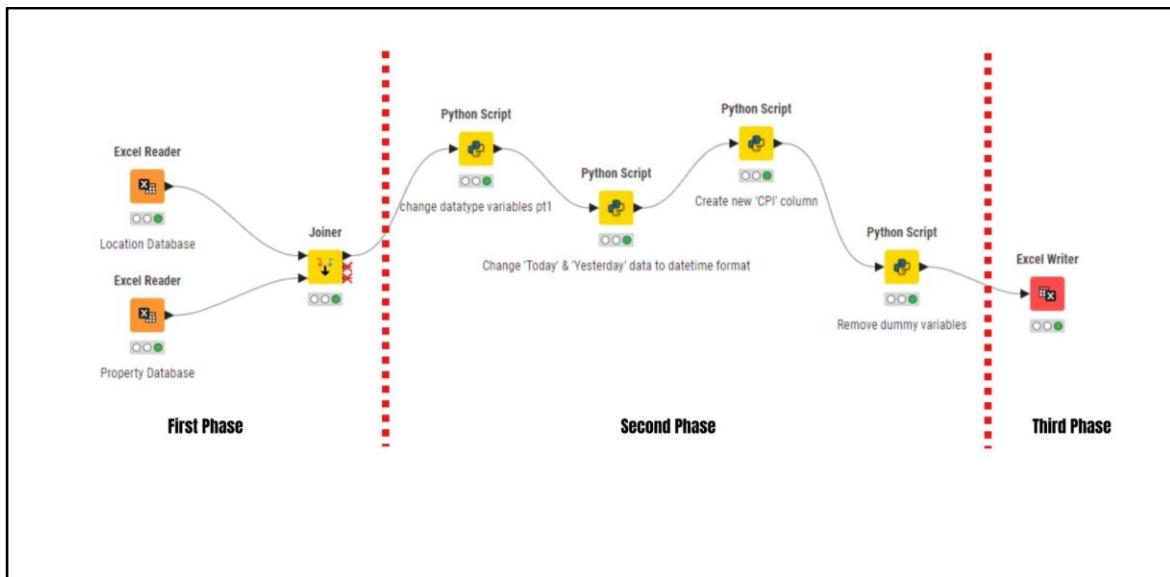


Figure 6: Pre-data cleaning workflow of Landprop Database

The first phase involves merging the Location Database and the Property Database to create a unified database that contains property data along with their respective locations. This integration ensures that each property's details are

accurately linked to its geographical information, forming a comprehensive dataset for analysis. The join/merge function is utilized to link the property dataset with the location dataset, using the webpage link as the primary identifier. Since the website typically uses general location data rather than precise GPS coordinates to specify properties, a single location entry can correspond to multiple property records in the dataset.

The second phase focuses on ensuring that the data is reliable and free from anomalies. Most of the data is initially stored as text, including fields like rent price, number of bedrooms, and number of bathrooms, which can sometimes lead to incorrect data classifications. To address these issues, each variable is adjusted according to its characteristics. For example, entries labelled as "Studio" in the number of bedrooms category are converted to 0, while any empty or missing data points are removed entirely from the database. This step ensures that the data is clean, consistent, and ready for further analysis. In the Posted Date column, some entries are labelled as 'Today' and 'Yesterday' to represent the dates when the property advertisements were posted. To ensure that the Posted Date variable is consistently classified as a date data type, these labels are replaced with their actual corresponding dates.

The Consumer Price Index (CPI) measures changes over time in the prices of consumer goods and services purchased by households during a specified time period. In this project, property types will be standardized based on the naming conventions used in the CPI. For example, "Condominium" will be standardized as "Sewa Rumah Condominium," while "Serviced Residence" will be standardized as

"Sewa Rumah Pangsapuri Khidmat." This standardization process eliminates ambiguity and ensures that the data used in the study aligns with the CPI's categorization, allowing for better integration and analysis.

3.4 Combining and Enrich Data

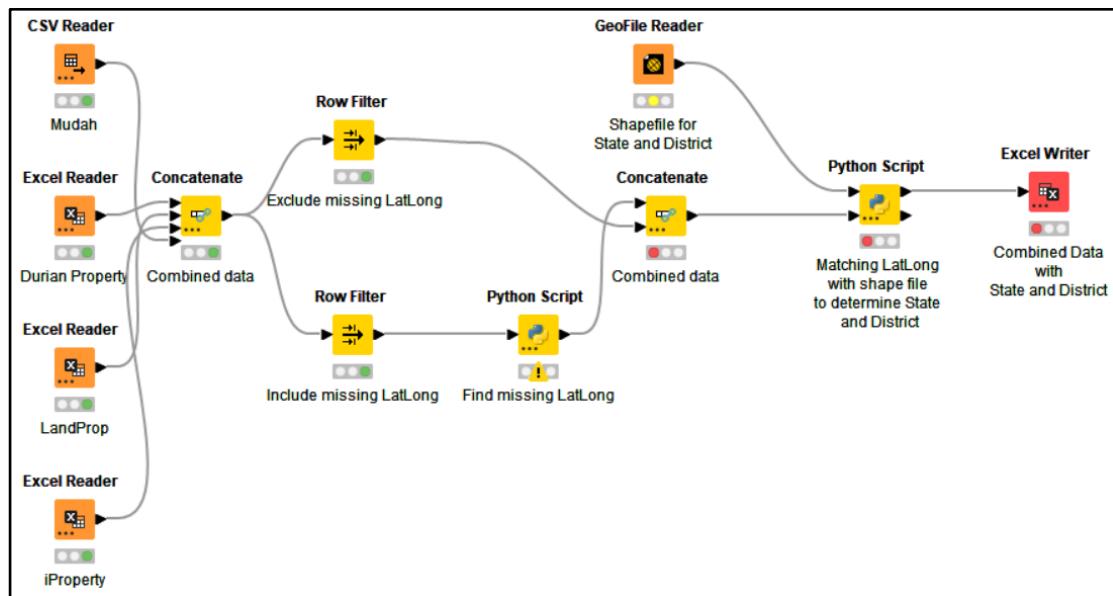


Figure 7: Workflow for Combining Data, and Finding Latitude, Longitude, State, and District

Following the data pre-cleaning phase, the collected datasets were merged into a single file for analysis purposes. The data came from various web scraping processes conducted across multiple websites, including Mudah, Durian Property, LandProp, and iProperty.

The total number of combined records amounts to 42,657, with the data sourced from multiple platforms. Specifically, Mudah contributed 23,946 records, accounting for 66.01% of the total, while Durian Property provided 3,828 records, representing 10.55%. LandProp added another 3,584 records, making up 9.88% of the dataset, and IProperty contributed 4,920 records, or 13.56%.

This comprehensive aggregation of records from different platforms ensures a diverse and robust dataset for further analysis.

3.4.1 Finding missing LatLong using MapBox Geocode

Based on the data collected, a total of 15,911 or 37.3% Latitude and Longitude (LatLong) values were missing. These LatLong coordinates are crucial for identifying the state and district for each rental listing. To address this issue, a geocoding process was implemented to retrieve the missing LatLong data.

Geocoding is the process of transforming unstructured text into structured spatial data, enabling the extraction of geographic coordinates from textual descriptions. This technology plays a vital role in a variety of fields, including disease surveillance, geospatial analysis, and disaster management (Zhang & Bethard, 2024).

To solve the issue of missing LatLong values, a Python script was developed to automate the process. This script utilizes a geocoding API to convert addresses into LatLong coordinates. APIs play a crucial role in geocoding by

granting access to extensive geographic information databases. They enable users to input address data and receive precise Latitude and Longitude coordinates in return.

Several geocoding services offer APIs for this purpose, including Google Maps Geocoding API, MapBox Geocoding API, HERE Geocoding API, and others. However, many of these services impose limits on the number of free requests allowed.

For this project, the MapBox API was selected, as it provides free access to up to 5,000 API requests per day and 100,000 requests per month, making it a suitable choice for obtaining the required LatLong data. This solution ensures that all missing coordinates can be efficiently retrieved without exceeding usage limits.

Addresses ↓	Latitude Number (double) ↓	Longitude Number (double) ↓
Bukit Rahman Putra, Sungai Buloh, Selangor	?	?
Bandar Menjalara, Kepong, Kuala Lumpur	?	?
Putrajaya, Putrajaya, Putrajaya	?	?
Koi Suites, Puchong, Selangor	?	?
Solok Midlands, Georgetown, Pulau Pinang	?	?
Verando Residence, Petaling Jaya, Selangor	?	?

Figure 8 : LatLong Data before GeoCoding

Addresses String	Latitude Number (dou...)	Longitude Number (double)
Bukit Rahman Putra, Sungai Buloh, Selangor	3.227	101.558
Bandar Menjalara, Kepong, Kuala Lumpur	3.195	101.631
Putrajaya, Putrajaya, Putrajaya	2.924	101.687
Koi Suites, Puchong, Selangor	3.067	101.623
Solok Midlands, Georgetown, Pulau Pinang	5.416	100.331
Verando Residence, Petaling Jaya, Selangor	3.1	101.647

Figure 9 : LatLong Data after GeoCoding

Figures 4 and 5 illustrate the Latitude and Longitude (LatLong) data before and after the geocoding process was applied. This process is essential for converting addresses into geographic coordinates. Users submit address data through the geocoding API, which then matches the address with its corresponding LatLong values provided by the geocoding service.

Through this process, missing coordinates are retrieved, ensuring that each address is accurately represented by its LatLong. The results, as shown in the figures, highlight the effectiveness of geocoding in enriching the dataset with spatial data.

3.4.2 Determining State and District Based on LatLong

Obtaining LatLong coordinates was a critical step, as the primary goal is to determine the corresponding State and District for each property listing.

The State and District were identified using the Shapefile containing the boundaries of 160 districts provided by the Department of Statistics Malaysia (DOSM). The State and District are determined by checking where the LatLong point falls within the boundaries in the Shapefile.

This spatial identification is essential for conducting rental analysis, such as calculating the average rental value for each State and District. Figures 6 and 7 display the data before and after the State and District were assigned.

Addresses String	Latitude Number (double)	Longitude Number (double)
Lebuhraya Bukit Jalil, Bandar Puchong Jaya, Puchong, Selangor	3.05	101.63
Tingkat Betek 6, Taman Sungai Rambai, Bukit Mertajam, Penang	5.36	100.448
Lorong Kota Permai, Taman Kota Permai, Bukit Mertajam, Penang	5.339	100.456
Jalan Petanak, Kuching, Sarawak	1.554	110.362
Jalan Bandar Baru Batu Kawah, Kuching, Sarawak	1.519	110.303

Figure 10: Data before identifying State and District

Addresses String	Latitude Number (double)	Longitude Number (double)	State String	District String
Lebuhraya Bukit Jalil, Bandar Puchong Jaya, Puchong, Selangor	3.05	101.63	SELANGOR	PETALING
Tingkat Betek 6, Taman Sungai Rambai, Bukit Mertajam, Penang	5.36	100.448	PULAU PINANG	SEBERANG PERAI TENGAH
Lorong Kota Permai, Taman Kota Permai, Bukit Mertajam, Penang	5.339	100.456	PULAU PINANG	SEBERANG PERAI TENGAH
Jalan Petanak, Kuching, Sarawak	1.554	110.362	SARAWAK	KUCHING
Jalan Bandar Baru Batu Kawah, Kuching, Sarawak	1.519	110.303	SARAWAK	KUCHING

Figure 11: Data after identifying State and District

3.5 Determine and Treat Outliers

3.5.1 Detecting outliers using visualization (Box Plot)

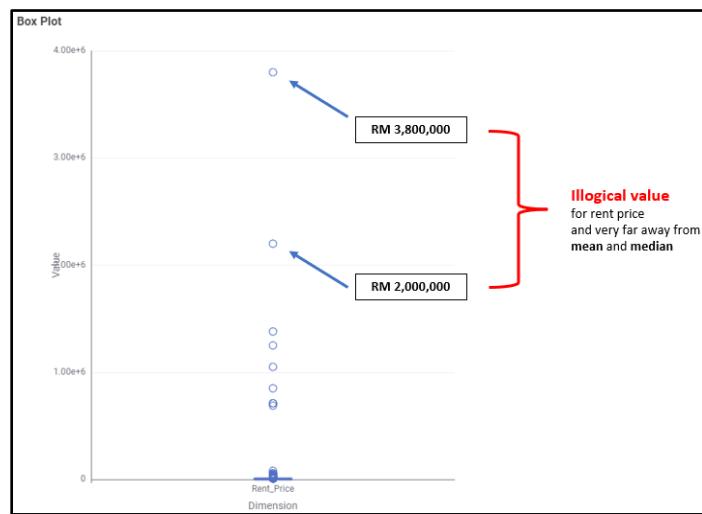


Figure 12 : Boxplot before addressing outliers

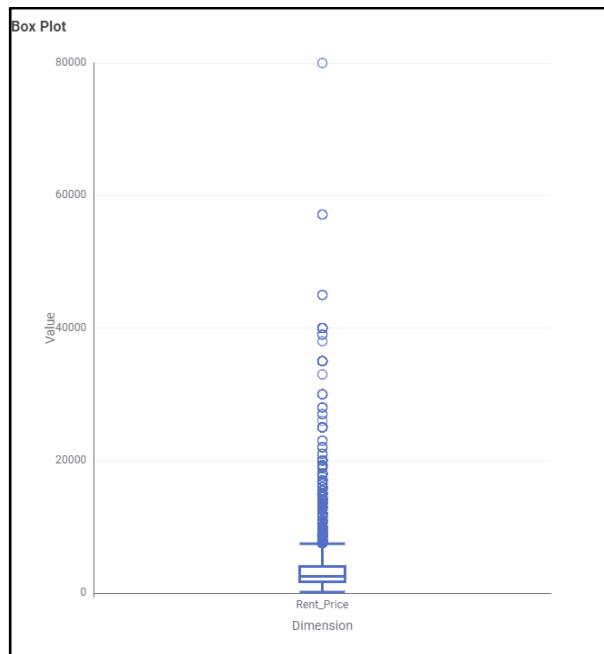


Figure 13: Boxplot after addressing outliers

Based on Figure 8, there are several data points that appear to be unreasonable, as they reach millions of ringgit. Additionally, these data points are significantly distant from the median and mean, increasing the likelihood that they are outliers. Such extreme outliers can heavily influence the mean and median values, making the data less accurate and unreliable for determining the average rental price in Malaysia. Therefore, these outliers must be addressed and managed before conducting further analysis.

3.5.2 K-Means clustering method

K-Means clustering is an unsupervised machine learning algorithm employed to group similar data points into distinct clusters. In this study, K-Means was utilized to categorize rental prices based on their similarities. The algorithm begins by initializing a predetermined number of cluster centroids and assigns each data point to the nearest centroid. It then iteratively adjusts the centroids until the clusters stabilize.

This analysis enabled the identification of clusters of rental prices, facilitating the detection of patterns within the price distribution. Listings with rental prices significantly distant from their respective cluster centroids were flagged as potential outliers, highlighting unusual or anomalous listings. The number of clusters was determined

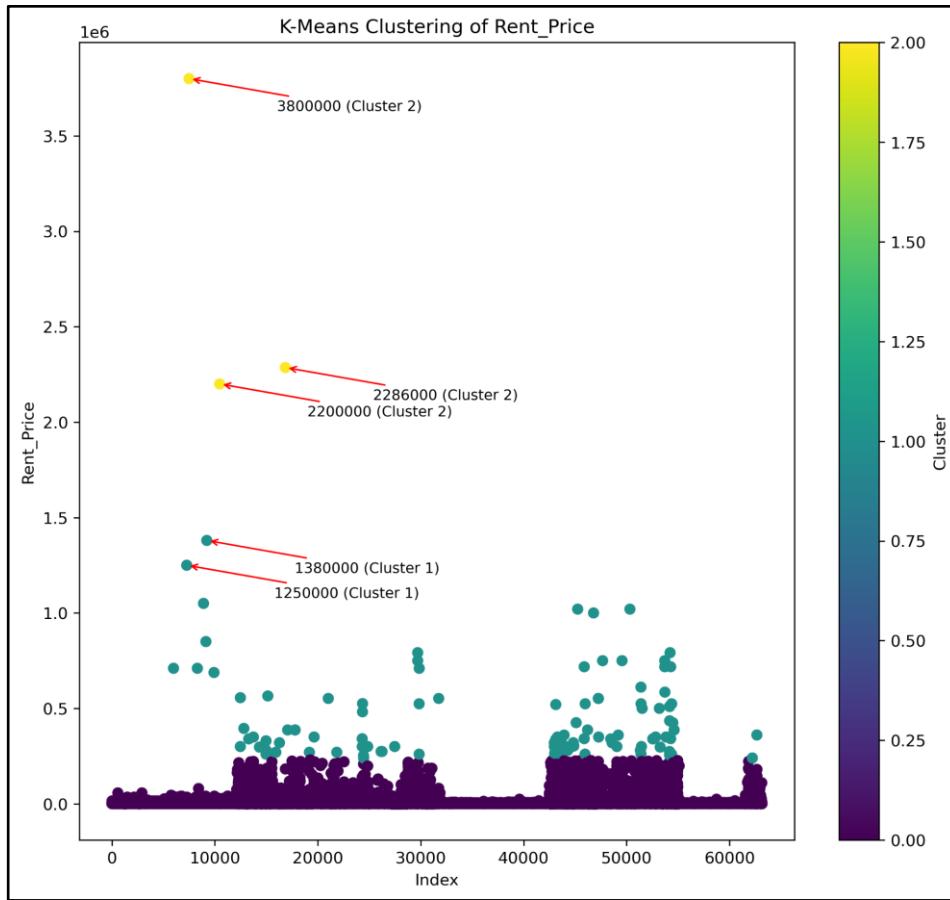


Figure 14: Price Distribution using K-Means clustering method

Based on the diagram, the dataset is segmented into three clusters: Cluster 1, Cluster 2, and Cluster 3. Cluster 1 exhibits a range of RM1.1 million to RM3.8 million, and Cluster 2 spans RM90,000 to RM 611,000. Cluster 3 falls between RM200 and RM80,000. For the purpose of this analysis, Clusters 1 and 2 are excluded due to their high potential as outliers and only 1.5% data was removed, which could significantly skew the overall mean and impact the robustness of the findings and Figure 9 presents the data after excluding outliers.

4. Findings

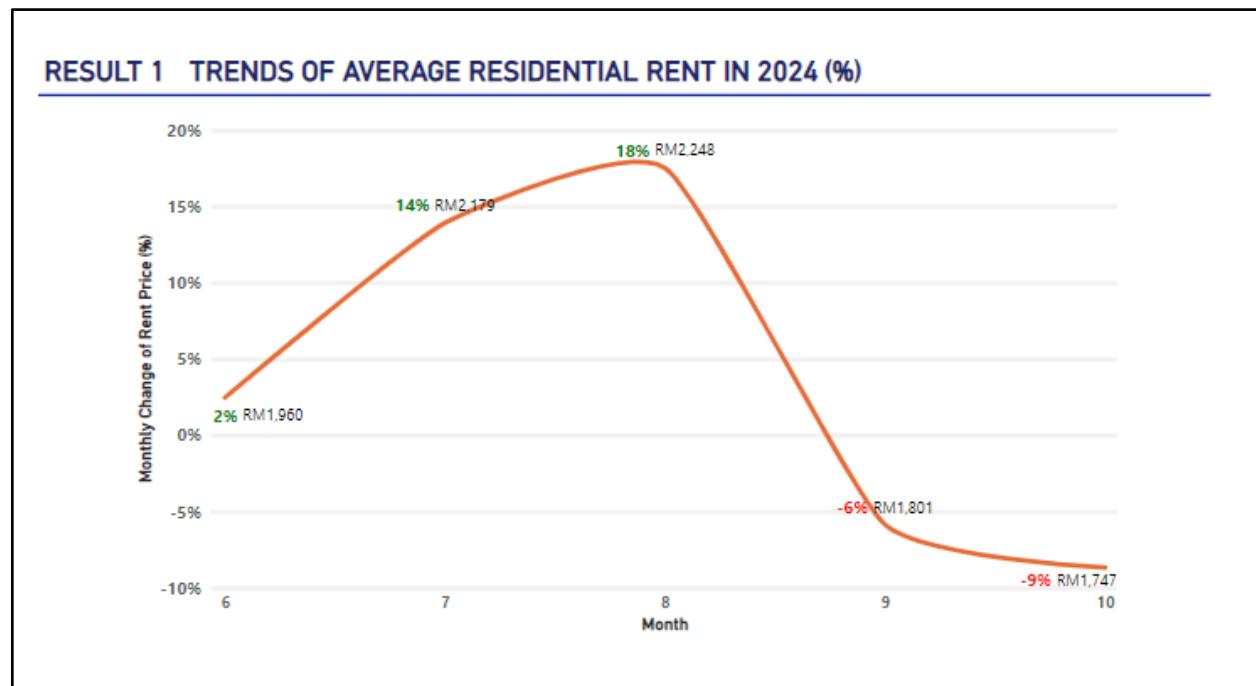


Figure 15: Line Graph of Trends of Average Residential Rent in 2024

Figure 15 above shows the trend of average house prices across Malaysia from June until October 2024, assessing the house price in general. Majority of the rent price was above **RM1,500** with a drastic increase of trends of 14% and 18% in July and August respectively. The lowest average rent price was in October with RM1,747 while the highest average rent price of Malaysia was in August with RM2,248. However, the rent price keeps declining as the current month of this data shows that the average rent price in October is lower than the average rent price since August.

RESULT 2 PROPORTION OF RESIDENTIAL UNITS BY RENT CATEGORY

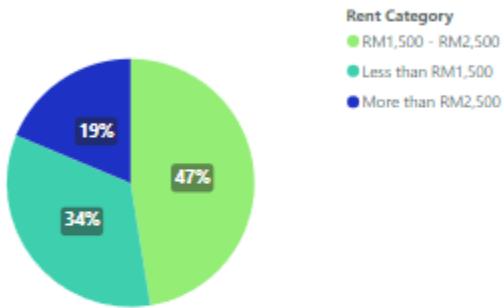


Figure 16: Pie Graph of Residential Units in 2024

Figure 16 presents a proportion of residential in Malaysia by price category. These price categories consist of 3 groups which are “Less than RM1,500”, “RM1,500 - RM2,500” and “More than RM2,500”. The results show that about 47% of the residential units are priced between RM1,500 and RM2,500 followed by 34% of the residential units priced less than RM1,500 and 19% of them priced more than RM2,500. This is also the reason why the majority of average rent prices of online listings units was above RM1,500 as more than half of advertised residential units was priced above RM1,500.

RESULT 3 AVERAGE RESIDENTIAL RENT BY PROPERTY TYPE

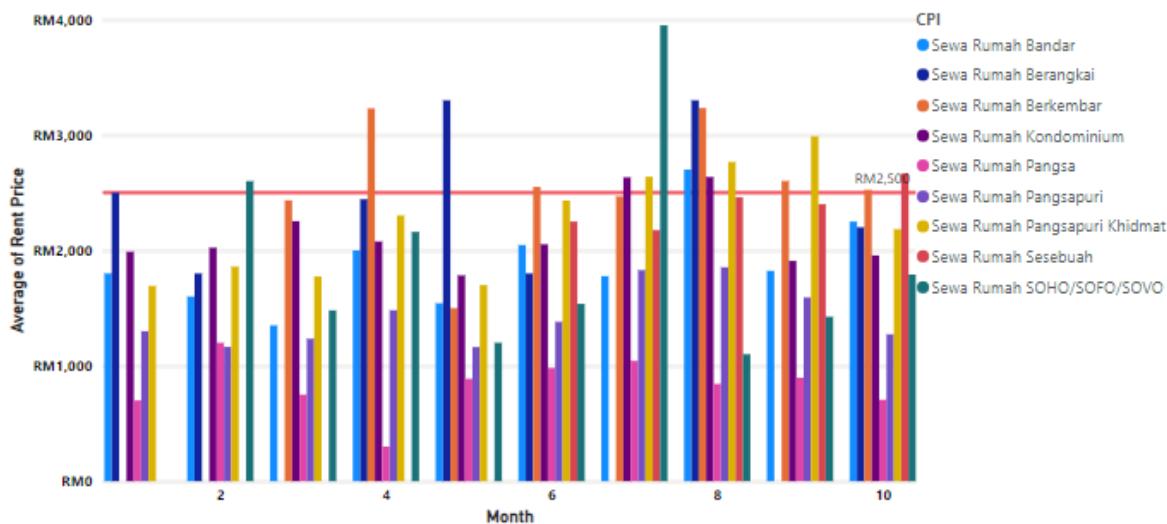


Figure 17: Cluster Bar Graph of Average Residential Rent by Property Type

In order to study the trends of average rent price more deeply, a cluster bar chart was used to identify which residential unit's type contributes more than half of the residential units that are priced higher than RM1,500 that are shown in **Figure 16**. From the **Figure 17** above, not only can it examine which property type has the majority of average rent higher compared to other property types but also identify the gap difference of rent between different property types.

RESULT 4 RELATIONSHIP BETWEEN RENT VS PROPERTY'S SIZE

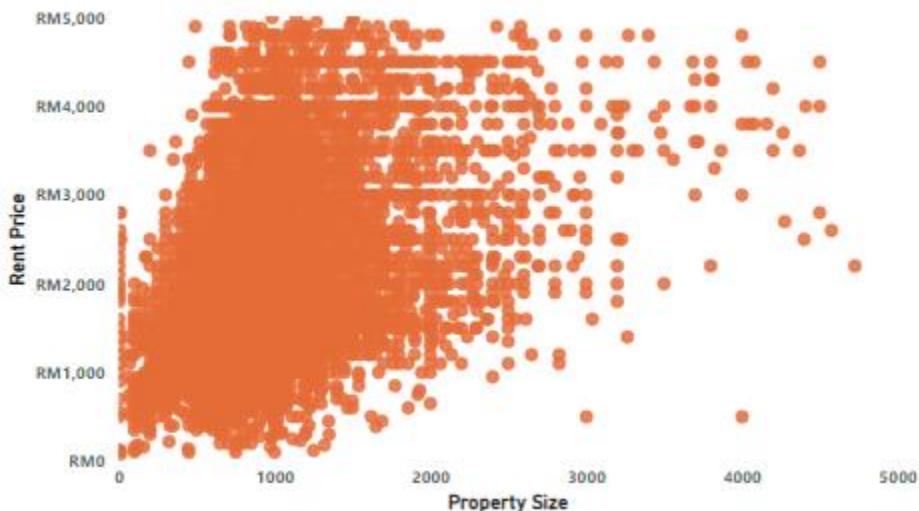


Figure 18: Scatter Graph of Rent vs Property Size

Figure 18 above shows a scatter plot between rent price and property's size to study whether there is a relationship between residential's rent price and property's size. The relationship can be determined by identifying whether there is an increase or decrease of trend in the scatter plot above and it seems that there is inconsistency between property's size and residential's rent price. Therefore, it can be concluded that from June until October 2024, the property's size was not affecting the residential rent price in Malaysia.

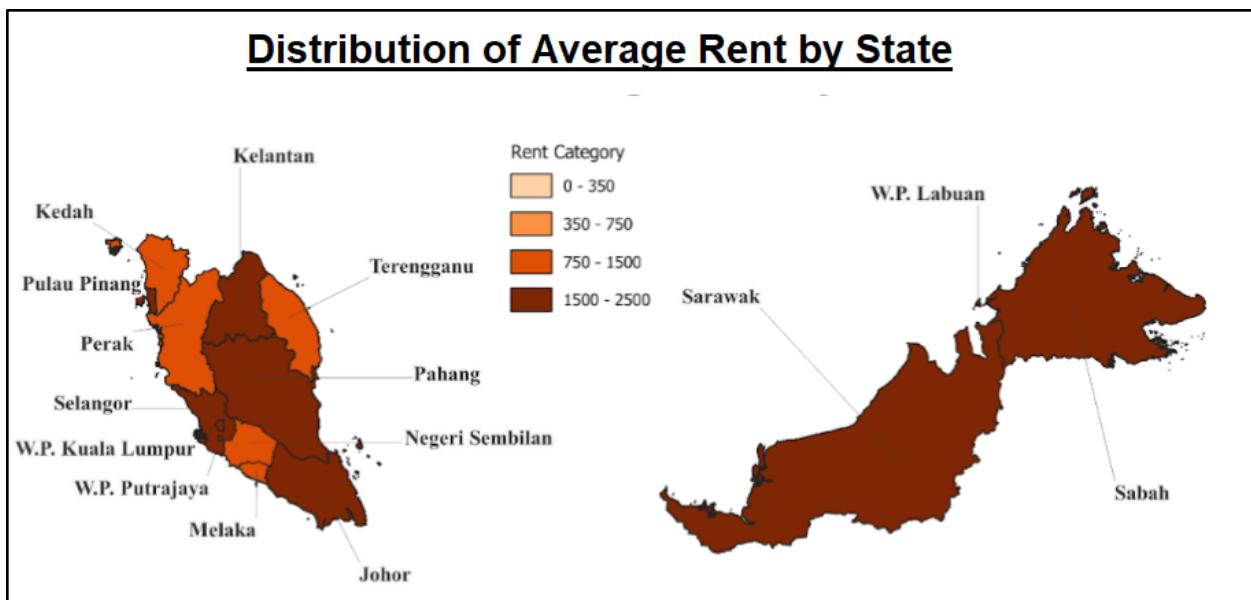


Figure 19: Distribution of Average Rent by State

The analysis presented in **Figure 19** highlights the distribution of average rental prices by state in Malaysia for 2024. The findings reveal that the majority of states exhibit average rental prices ranging between RM1,500 and RM2,500. In contrast, only a few states which were Melaka, Negeri Sembilan, Terengganu, Perak, and Kedah showed average rental prices within a lower range of RM750 to RM1,500. This distinction provides insight into regional variations in rental affordability and market segmentation.

RESULT 5 MONTHLY CHANGE (%) OF AVERAGE RENT PRICE BY STATE

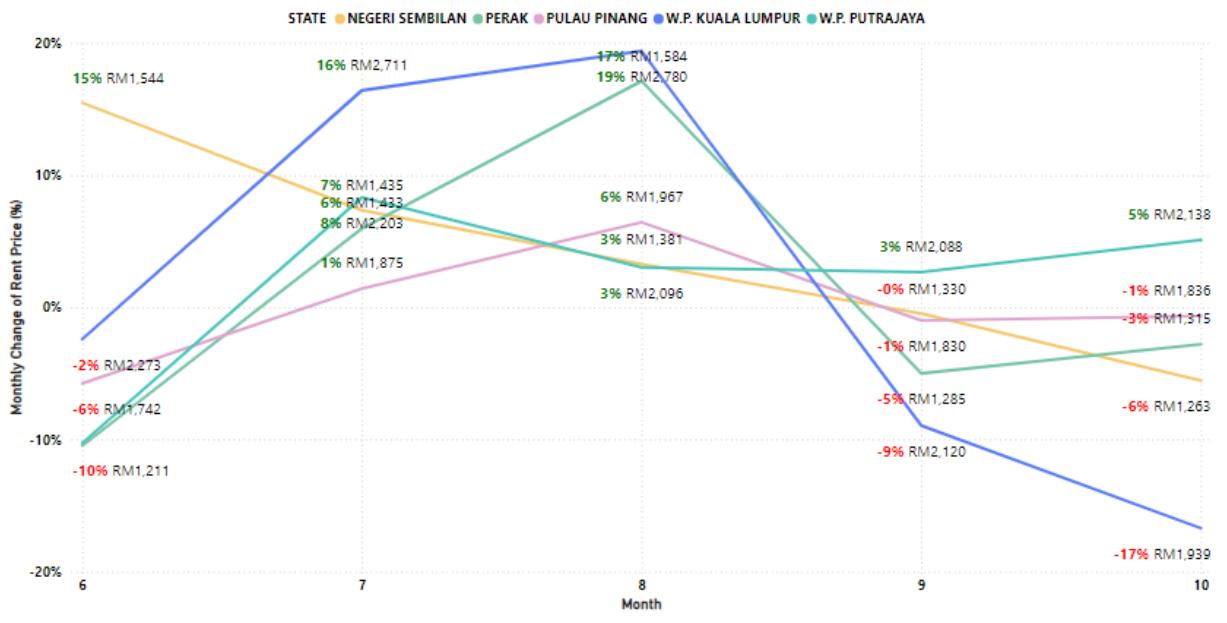


Figure 20: Line Graph of Monthly Change (%) of Average Rent Price by State

Figure 20 shows the monthly changes in rental prices in Malaysia's top five states.

Each data point represents monetary values (in RM) alongside the percentage change. Negeri Sembilan experienced a significant 15% drop in June, resulting in RM 1,544, followed by a 7% recovery in July to RM 1,435. However, its average rent price steadily declined in subsequent months, closing October at RM 1,263 after a 6% decrease. Perak saw an initial 10% decline in June to RM 1,211 but rebounded with a 6% increase in July, peaking at RM 1,584 in August with a 17% rise. By October, average rent price fell to RM 1,315 following a 5% and 3% decrease in September and October, respectively.

Pulau Pinang showed milder fluctuations, starting with a 6% drop in June to RM 1,742. It then improved gradually, reaching RM 1,967 in August after a 6% rise, but fell slightly to RM 1,836 by October. W.P. Kuala Lumpur exhibited the most volatility, dropping 2% in June to RM 2,273, followed by a robust 16% growth in July to RM 2,711 and peaking at RM 2,780 in August with a 19% rise. However, it ended October at RM 1,939 after a steep 17% decline. W.P. Putrajaya showed a relatively stable upward trend, beginning with a 10% drop in June to RM 1,211 but steadily growing through the months, reaching its highest at RM 2,138 in October after a 5% increase.

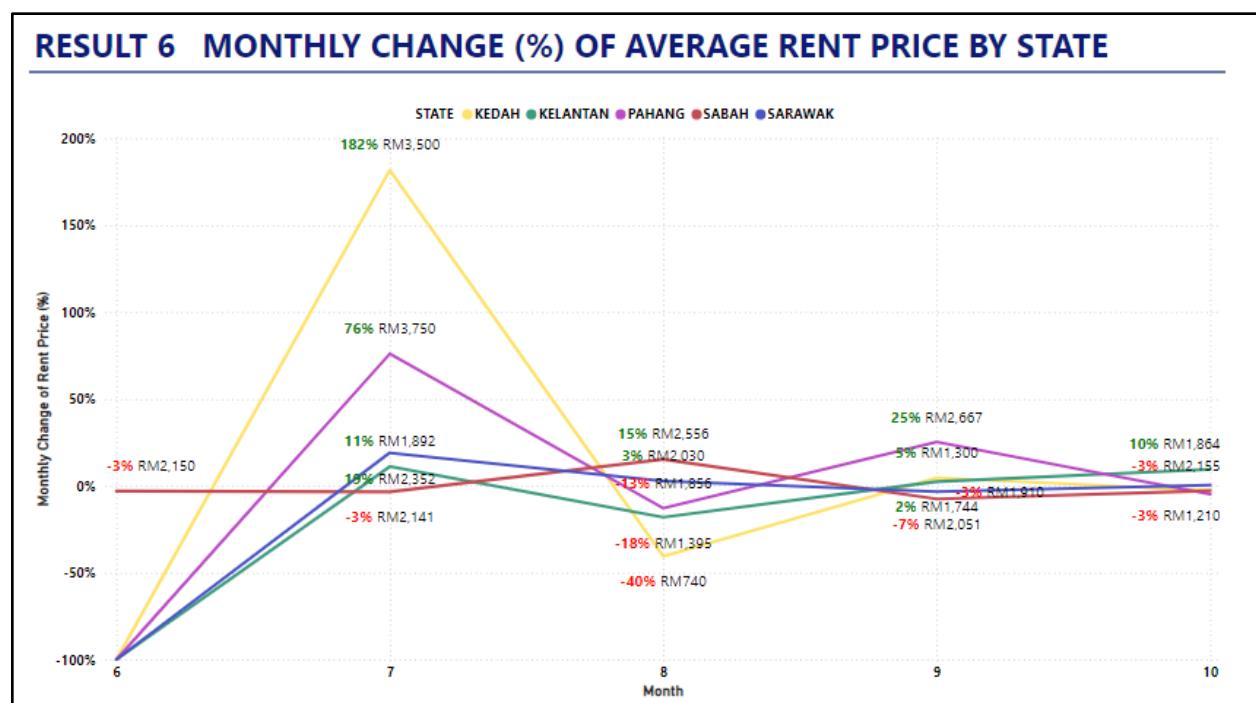


Figure 21: Line Graph of Monthly Change (%) of Average Rent Price by State

The monthly changes in rental prices in other states of Malaysia are represented in **Figures 21** and **Figure 22**. **Figure 21** shows Kedah exhibited dramatic fluctuations, starting with no average rent price in June (a 100% decline) and rebounding sharply in July with an 182% increase to RM 3,500, the highest average rent price it achieved during this period. However, it saw a sharp 40% decline in August to RM 740, followed by a partial recovery in September to RM 1,300 (5% increase) before ending October slightly lower at RM 1,210 after a 3% drop. Kelantan displayed more moderate and steady changes. After reporting no average rent price in June, it grew by 11% in July to RM 1,892. Although it experienced an 18% decline in August to RM 1,395, Kelantan gradually recovered, recording a slight 2% increase in September to RM 1,744 and a 10% rise in October to RM 1,864.

Pahang demonstrated strong performance overall, recovering from no average rent price in June to reach RM 3,750 in July, a 76% increase and the highest average rent price among the states that month. However, it saw a 13% decline in August to RM 1,856. Pahang rebounded in September with a 25% increase to RM 2,667 but ended October slightly lower at RM 2,028 following a 5% decline. Sabah maintained relatively consistent average rent price levels with moderate fluctuations. It began at RM 2,150 in June after a 3% decline, slightly decreased by another 3% in July to RM 2,141, and peaked in August with a 15% increase to RM 2,556. However, it experienced declines of 7% in September and 3% in October, settling at RM 2,051 and RM 2,155, respectively. Sarawak faced some fluctuations but was relatively stable compared to Kedah or Pahang. It reported no average rent price in June but rebounded by 19% in July to RM 2,352.

August brought a modest 3% increase to RM 2,030, followed by a 3% decline in September to RM 1,910. Sarawak closed the period with a slight 1% increase in October, reaching RM 1,986.

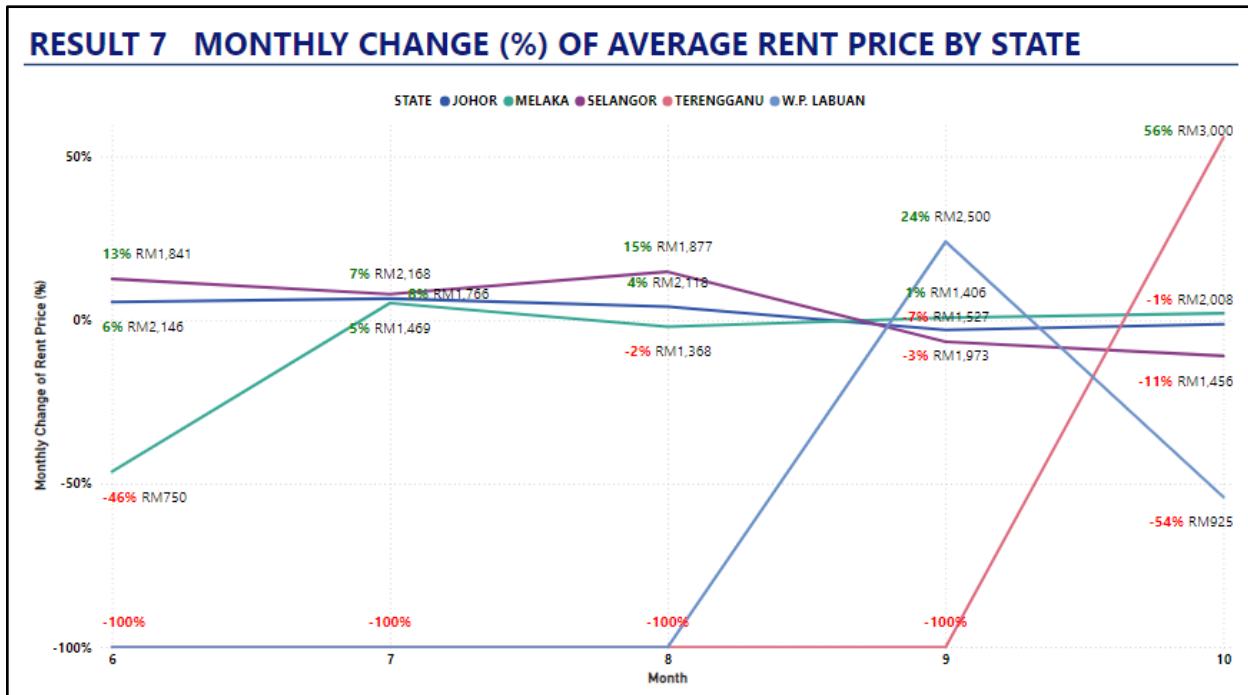


Figure 22: Line Graph of Monthly Change (%) of Average Rent Price by State

Meanwhile, **Figure 22** shows Johor demonstrated relatively stable average rent price levels with minor fluctuations. Starting with a 6% increase in June at RM 2,146, it grew slightly by 7% in July to RM 2,168. However, average rent price declined modestly by 4% in August (RM 2,118) and by 3% in September (RM 1,973), before recovering slightly in October with a 1% increase to RM 2,008. Melaka showed moderate variability in its average rent price performance. After a sharp 46% decline in June to RM 750, it rebounded by 5% in July to RM 1,469. August saw a slight 2% decline to RM 1,368,

followed by a marginal 1% increase in September (RM 1,406). By October, Melaka recorded a further 2% rise, ending the period at RM 1,425.

Selangor exhibited a mix of growth and decline over the months. Starting with a 13% increase in June at RM 1,841, it dipped by 8% in July to RM 1,766, only to recover with a 15% increase in August, reaching RM 1,877. However, the average rent price declined sharply by 7% in September (RM 1,527) and 11% in October, closing the period at RM 1,456. Terengganu had no average rent price for the first four months, consistently recording a 100% decline from June to September. However, in October, it experienced a dramatic turnaround with a 56% increase, generating RM 3,000, the highest average rent price among all states in that month. W.P. Labuan also recorded no average rent price from June to August, showing a 100% decline for three consecutive months. In September, it rebounded significantly with a 24% increase to RM 2,500 but dropped sharply by 54% in October, closing at RM 925.

RESULT 8 AVERAGE RENT PRICE BY STATE AND PROPERTY TYPE

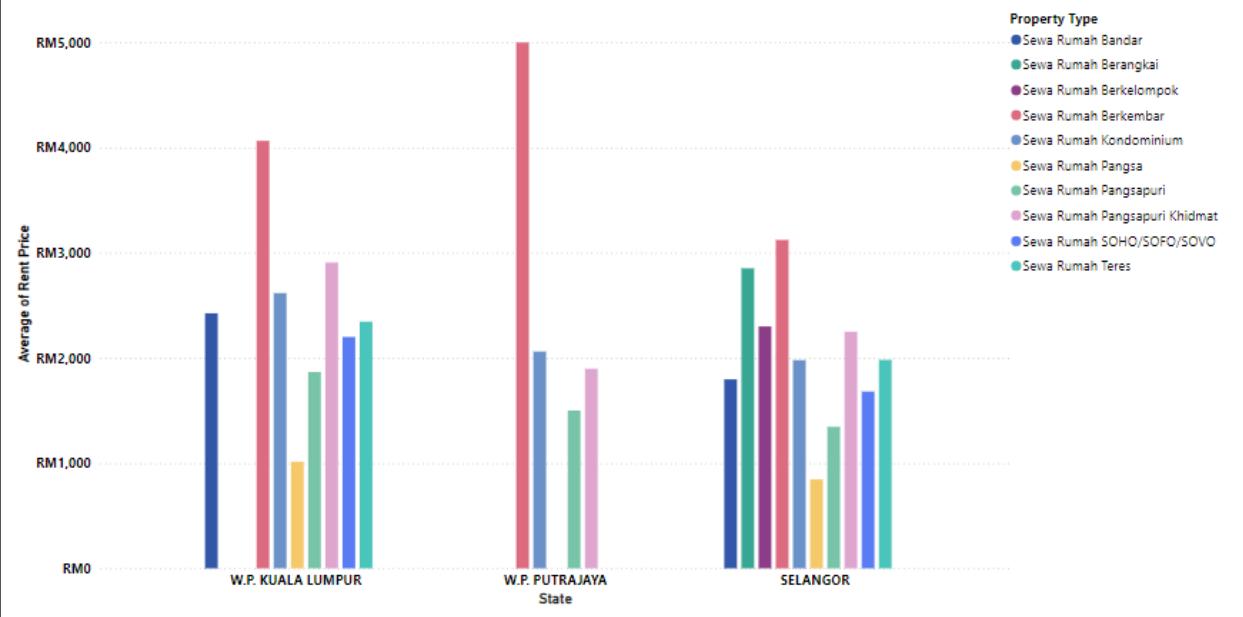


Figure 23: Cluster bar chart of Average Rent Price by State and Property Type

The cluster bar chart highlights the top three states in Malaysia by presenting the average rent prices for W.P. Kuala Lumpur, W.P. Putrajaya, and Selangor by state and property type. In W.P. Kuala Lumpur, the most expensive property type is the Sewa Rumah Berkembar, with an average rent of RM4,065, followed by Sewa Rumah Pangsapuri Khidmat at RM2,908, and Sewa Rumah Bandar at RM2,425.

In W.P. Putrajaya, the Sewa Rumah Berkembar, leads the market with an impressive average rent of RM5,000, making it the highest across all regions. This is followed by Sewa Rumah Kondominium, averaging RM2,061. The third spot is occupied by Sewa Rumah Pangsapuri, which has an average rent of RM1,500.

In Selangor, the highest rental price is for Sewa Rumah Berkembar at RM3,123 followed by Sewa Rumah Berangkai at RM2,853 and Sewa Rumah Berkelompok at

RM2,300. Sewa Rumah Teres Have has an average rental price of RM1,982, while Sewa Rumah Bandar and Sewa Rumah SOHO/SOFO/SOVO are slightly lower, at RM1,797 and RM1,681, respectively. Sewa Rumah Pangsapuri averages RM1,346 per month, and the lowest rental price is for Sewa Rumah Pangsa at RM846.

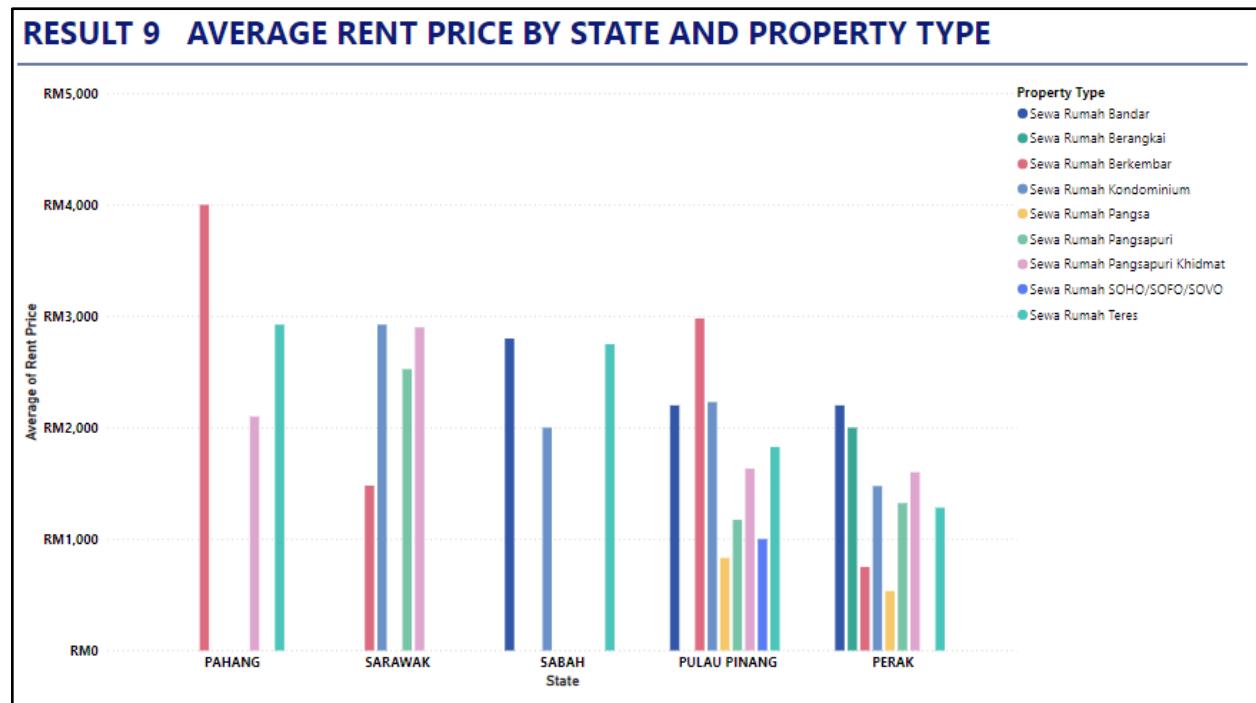


Figure 24: Cluster bar chart of Average Rent Price by State and Property Type

Figures 24 and Figure 25 show the average rent prices by state and property type for other states in Malaysia. **Figure 24** shows Pahang records the highest rental price, with Sewa Rumah Berkembar costing RM4,000, while other property types, such as Sewa Rumah Pangsapuri Khidmat are priced at RM1,100. In Sarawak, Sewa Rumah Berkembar rentals are significantly lower at RM1,480, while the highest Sewa Rumah Kondominium at RM2,925 and Sewa Rumah Pangsapuri averages RM2,525. Sabah's rentals are led by Sewa Rumah Bandar at RM2,800, followed closely by Sewa Rumah Teres at RM2,750 and Sewa Rumah Kondominium at RM2,000. Pulau Pinang offers a mix of affordable and

mid-range rentals, with Sewa Rumah Pangsa costing RM831 and Sewa Rumah Teres at RM1,827, while Sewa Rumah Berbandar and Sewa Rumah Berkembar are priced higher at RM2,200 and RM2,980, respectively. Perak is the most affordable state, with Sewa Rumah Pangsa at RM533 and Sewa Rumah Berkembar at RM750, while Sewa Rumah Bandar and Sewa Rumah Kondominium remain below RM2,200.

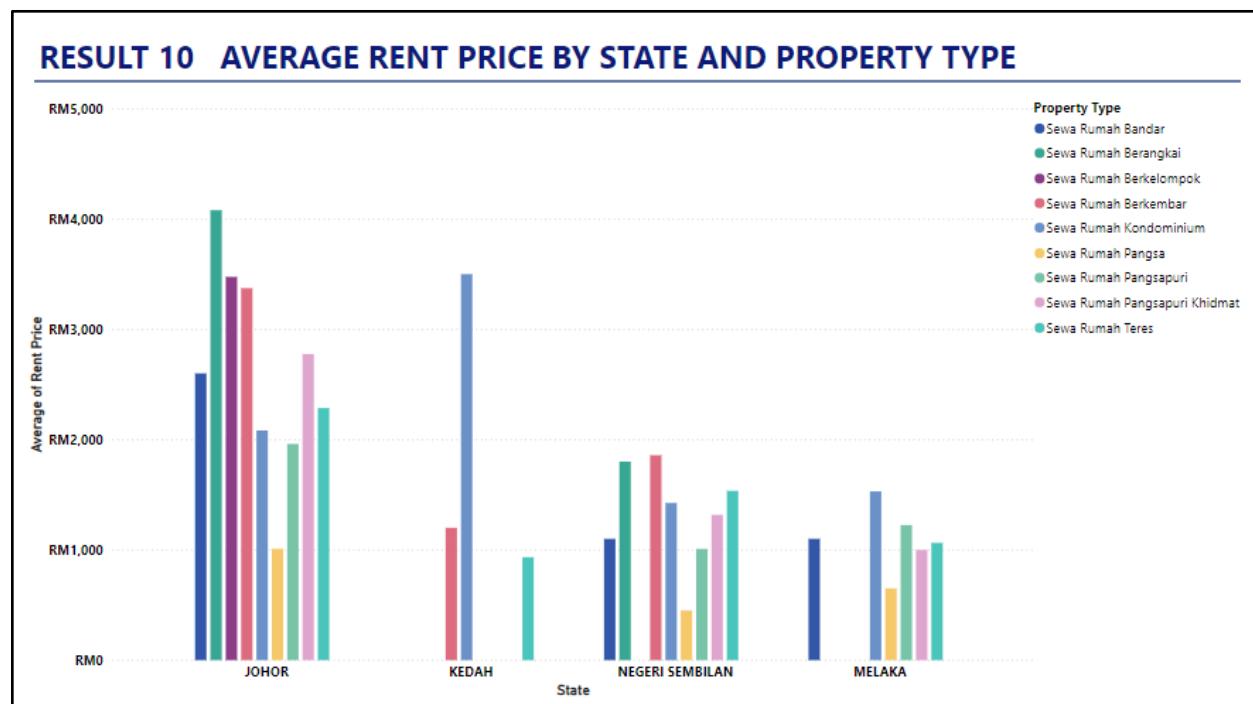


Figure 25: Cluster bar chart of Average Rent Price by State and Property Type

Meanwhile, **Figure 25** shows that in Johor, rental prices are the highest among the states, with Sewa Rumah Berangkai averaging RM4,080 and Sewa Rumah Berkelompak at RM3,475. Other property types, such as Sewa Rumah Bandar and Sewa Rumah Kondominium, are priced at RM2,600 and RM2,083, respectively, while Sewa Rumah Pangsa is the most affordable at RM1,010. Kedah, in contrast, has the highest average rent for Sewa Rumah Kondominium at RM3,500, followed by Sewa Rumah Berkembar at RM1,200, indicating fewer property options or data availability in the state. In Negeri

Sembilan, the highest rental price is for Sewa Rumah Berangkai at RM1,800, while Sewa Rumah Kondominium and Sewa Rumah Bandar are moderately priced at RM1,425 and RM1,100, respectively, with Sewa Rumah Pangsa being the most economical option at RM450. Melaka shows comparatively lower rents, with Sewa Rumah Kondominium leading at RM1,530, followed by Sewa Rumah Bandar at RM1,100 and Sewa Rumah Teres at RM1,064, while Sewa Rumah Pangsa remains the cheapest at RM650.

In conclusion, urban centers like KL and Selangor have higher average rents for properties that cater to wealthier residents or those seeking luxury and convenience, such as condominiums and high-end homes. In contrast, suburban and rural areas offer affordable rental options like Sewa Rumah Pangsa or basic houses, which are more aligned with the local population's income levels and needs. The disparity highlights how location and property type strongly influence rental prices in Malaysia.

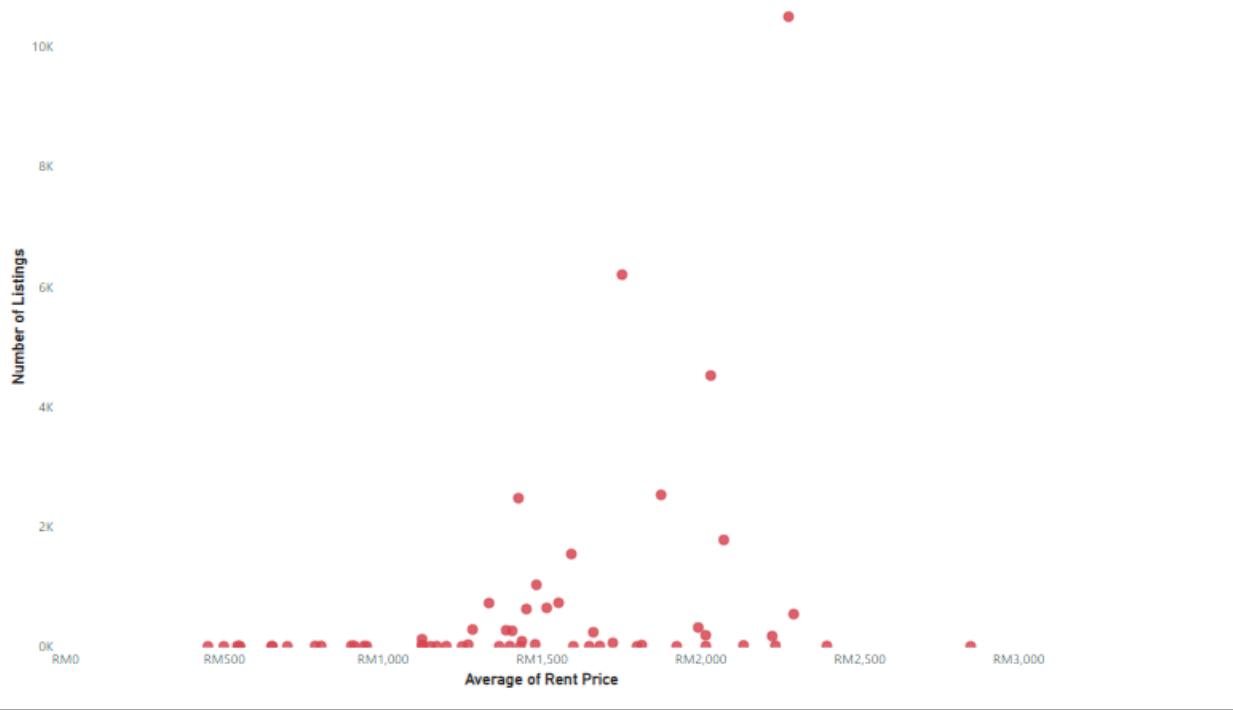
RESULT 11 RELATIONSHIP BETWEEN AVERAGE RENT PRICE VS NUMBER OF LISTINGS PER DISTRICT

Figure 26: Scatter graph number of listings and average of rent per district

The scatter graph shows a relationship between the number of listings and the average rent price across districts, which can help analyze rental properties' demand and supply dynamics. The number of listings appears to peak in districts where the average rent price is around RM2,000, indicating a balance between affordability and demand. However, as rent prices increase beyond RM2,000, listings drop significantly, which may reflect reduced demand for high-priced rentals or limited supply in premium markets. Conversely, while many districts show lower average rent prices (below RM1,000), the number of listings in these categories remains relatively small.

5. Rent Surveillance Analysis Dashboard

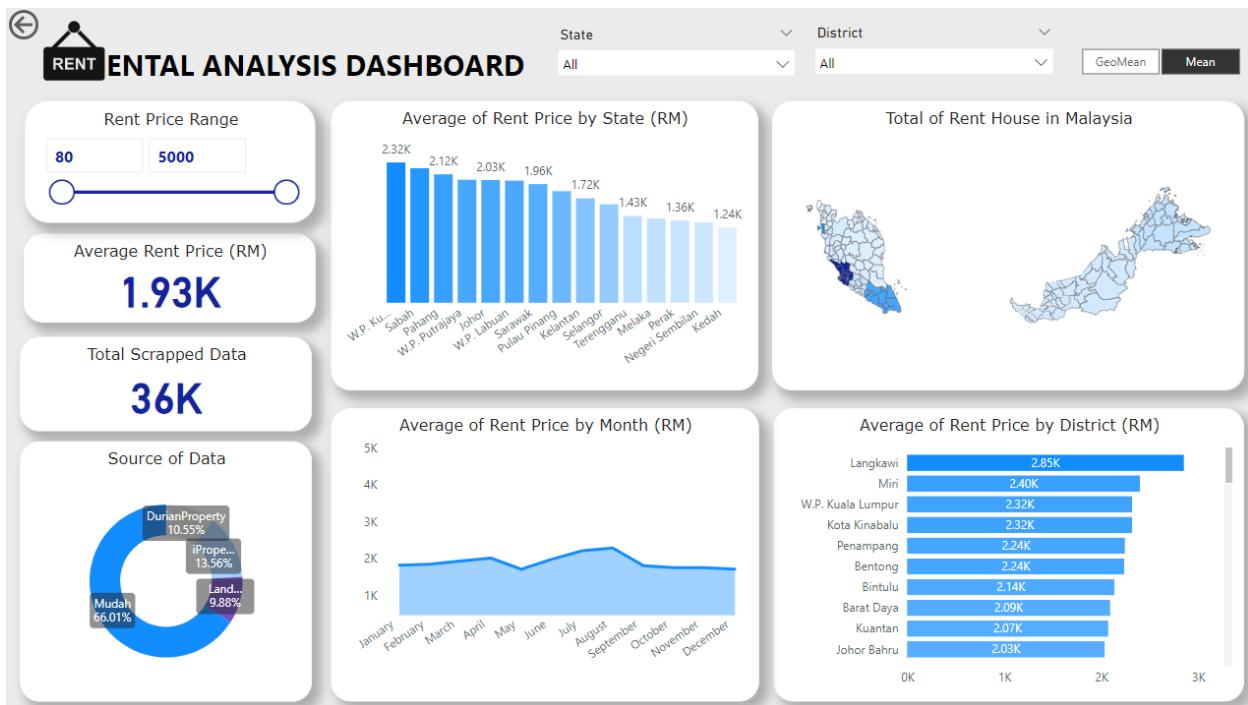


Figure 27: First Page Rental Analysis Dashboard

Figure 11 above provides a general analysis of rental prices in Malaysia, presenting insights from an aggregated online data analysis. Some of the key questions addressed in this analysis include:

1. What is the average rental price in Malaysia based on online data?
2. What is the total volume of data gathered for this rental price analysis?
3. Which website contributes the largest percentage of rental data?
4. Which state has the highest average rental price?
5. What is the average rental price for the years 2023 and 2024?
6. Which state has the highest frequency of rental listings online?
7. Which district records the highest average rental price in Malaysia?

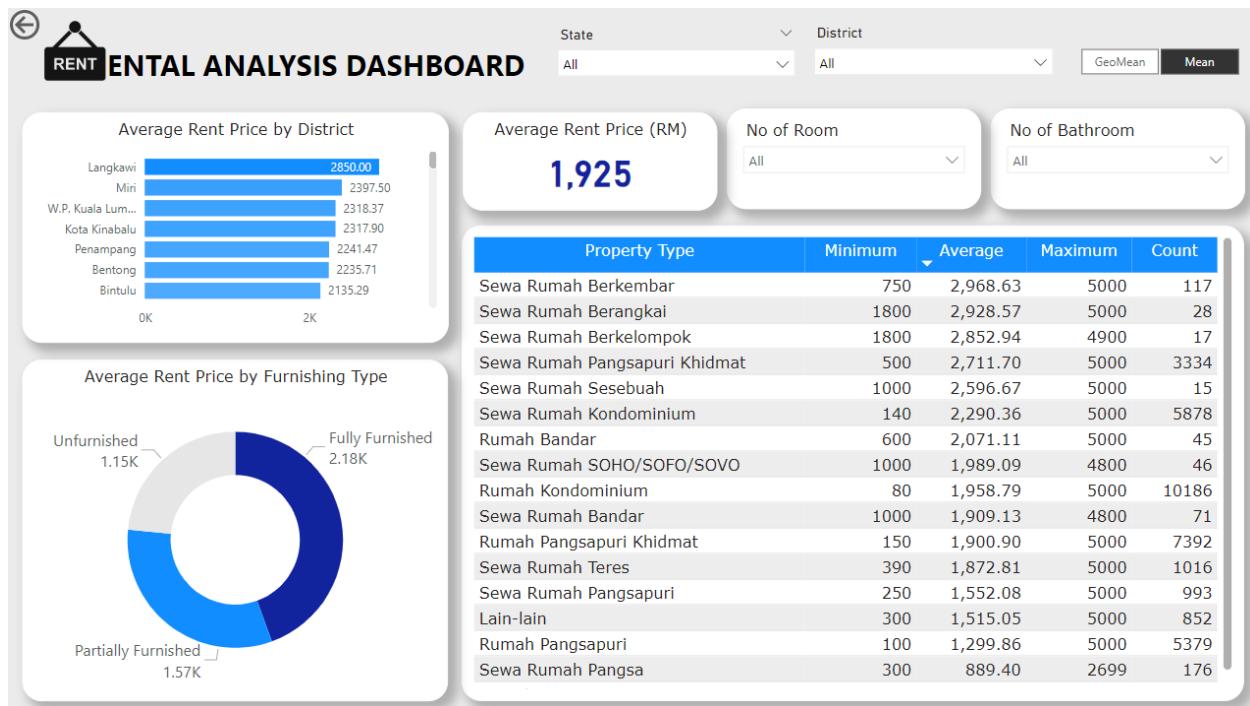


Figure 28: Second Page Rental Analysis Dashboard

This Figure 27 analyzes rental prices in Malaysia, addressing key questions about average prices, district variations, property types, and furnishing levels to provide insights into the rental market.

1. How do average rental prices vary by district?
2. Which district has the highest average rental price?
3. What is the average rental price by furnishing type (e.g., fully furnished, partially furnished, unfurnished)?
4. What is the distribution of rental prices by property type?
5. Which property type has the highest and lowest average rental price?
6. How does the number of rooms or bathrooms impact the average rental price?
7. Which district records the highest rental listing count?

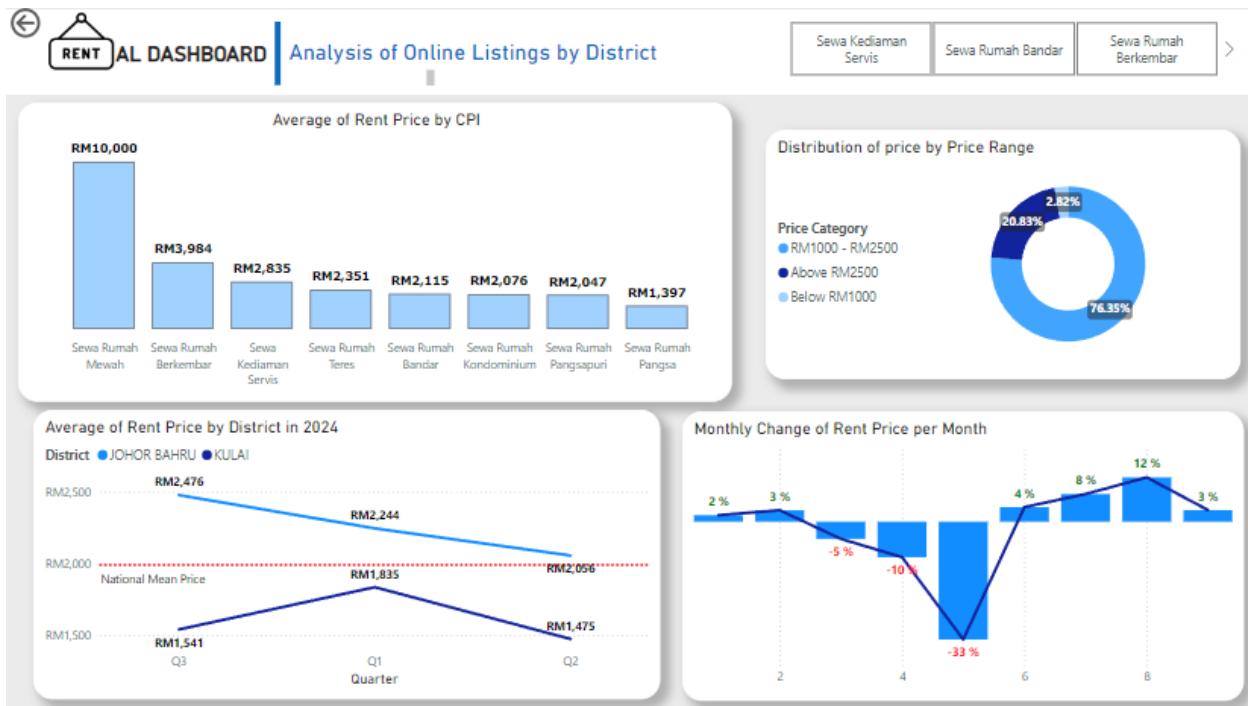


Figure 29: Third Page Rental Analysis Dashboard

The figure 28 presents findings on the rent of online listings by state, incorporating a time series analysis along with categorical analyses by property type and price range. The research aims to address the following objectives:

1. Highlight the highest and lowest rent between property types (CPI) across different states.
2. Identify the variations in average rent for different property types (CPI) such as apartments or landed houses within each states
3. Evaluate the percentage of properties in the affordable range (Below RM1,500) compared to mid-range and high-range properties across different states.
4. Identify seasonal patterns or trends in rent within states
5. Highlights which states have consistently rising, stable or declining rent over time.

6. Evaluate the quarterly and monthly changes of rent for individuals states

6. Conclusion

6.1 Conclusion

From June to October 2024, Malaysia's rental market showed fluctuating trends, with average rents peaking in August at RM2,248 before declining to RM1,747 in October. Nearly half (47%) of residential units were priced between RM1,500 and RM2,500, while 34% were below RM1,500, and 19% exceeded RM2,500, explaining the dominance of rents above RM1,500. Analysis revealed that certain property types significantly contributed to higher rent categories, with notable price gaps across types. However, a scatter plot showed no consistent relationship between property size and rent price, suggesting other factors, such as location or amenities, played a greater role in influencing rents.

Malaysia's rental market in 2024 shows notable differences across states and property types. Most states had average rents between RM1,500 and RM2,500, except for Melaka, Negeri Sembilan, Terengganu, Perak, and Kedah, where rents ranged from RM750 to RM1,500. Monthly trends showed fluctuations, with states like Negeri Sembilan and Perak experiencing drops followed by partial recoveries, while W.P. Kuala Lumpur peaked in August at RM2,780 before falling to RM1,939 in October.

Kedah showed sharp changes, rebounding in July but dropping again in later months, while Kelantan had more steady improvements. States like Sabah, Sarawak, and Johor showed moderate changes, and W.P. Putrajaya steadily increased, reaching its highest rent in October.

In terms of property types, urban areas like Kuala Lumpur and Selangor had higher rents for premium properties like Sewa Rumah Berkembar and condominiums, reflecting demand for luxury homes. More affordable options, like Sewa Rumah Pangsa, were common in Kedah, Melaka, and Negeri Sembilan, catering to middle-income groups.

This analysis highlights how location and property type influence rental prices. Urban areas have higher rents due to better facilities and demand, while suburban and rural areas remain more affordable, matching local income levels. These insights can help in planning rental strategies and understanding market trends.

6.2 Report's Limitation

6.2.1 Geocoding API request limitation

One of the limitations of this study is the reliance on free access for the geocoding process in determining Latitude and Longitude (LatLong) coordinates. Each geocoding application has restrictions on the number of requests allowed for obtaining LatLong data. To optimize the use of available access, any existing LatLong data in the designated column will be excluded from the geocoding process. This approach ensures that the API requests are utilized efficiently, minimizing unnecessary calls and maximizing the retrieval of missing coordinates.

6.2.2 Missing Value

Each rental website presents information in a different structure. For example, the "date posted" field has a high number of missing values, with 43,435 entries lacking this information. This necessitates excluding nearly half of the dataset from the analysis, leading to a significant reduction in the available rental data. This exclusion impacts the comprehensiveness of the dataset, limiting the analysis and potentially affecting the accuracy of the trends observed.

6.2.3 Unsuitable Data Storage

Uploading and retrieving data has become more difficult. After collecting the data, it is saved directly to the main computer's file directory. Each collection adds about 200MB of data, which quickly fills up the limited storage space on each computer. This is a problem because the project collects data from four websites using four separate computers. Users must manually upload the data to a central storage system and then do the data cleaning after uploading. This process is slow, prone to errors, and does not automatically update the data directory, causing delays and inefficiencies.

6.2.4 Inconsistent Data for Time Series Analysis

Figures 20, Figures 21, and Figures 22 show line graphs with inconsistent trends in rental data. This inconsistency is due to missing records of online rental data for certain states during specific months, making it difficult to accurately analyze monthly changes in rental prices by state. Additionally, the dataset lacks

balance when comparing rent prices with the Consumer Price Index (CPI), which impacts the reliability of the average rent by CPI. The significant variation between CPI values further affects the data's reliability, making it unsuitable for detailed analysis. Besides that, this project could only cover the rent analysis starting June until October 2024 only.

6.2.5 Avoiding IP Bans

The primary data source for this project was secondary data, collected through web scraping of online rental listings in Malaysia. However, the data collection process faced challenges, including IP bans caused by using a local Wi-Fi network on a local server. To address this issue, using a VPN is recommended for web scraping, as it allows access to specific pages and avoids restrictions by masking the IP address. Despite this, another challenge arose where the VPN would occasionally disconnect automatically during the scraping process, causing the data collection to stop abruptly. These interruptions highlight the importance of ensuring a stable VPN connection to maintain an uninterrupted data collection workflow.

6.2.6 Lack of Geospatial Analysis

The data availability was limited, as it relied solely on the sample provided by online rental advertising websites. For the geospatial category, only latitude and longitude data were available, while key information such as urban or rural classification was missing. This lack of detailed geospatial data restricts the ability

to conduct in-depth spatial analysis or explore factors influencing rental prices based on location characteristics.

6.2.7 Mismatch specification between Property Type & Consumer Price Index (CPI)

During the data collection process, it was observed that the property types specifications collected from online rental advertisements did not align with the categories used in the CPI item. This mismatch makes it challenging to accurately compare the average rent by category from online sources with the average rent by category from local data, potentially impacting the reliability of the analysis.

6.3 Project's Benefits

This project offers significant benefits to Malaysia as a whole, including property organizations, policymakers and the Department of Statistics Malaysia (DOSM) by addressing the unique challenges and opportunities within the local rental market.

One key advantage is the implementation of time series analysis to monitor changes in rental trends across Malaysia's diverse regions. This approach enables the identification of patterns such as seasonal fluctuations linked to festive periods, academic cycles or economic activities, providing valuable insights for property organizations and policymakers. By utilizing data from online rental advertisements, stakeholders can estimate average rental prices across states and regions, tailoring their pricing, policies or strategies to meet local demand. Regular updates ensure that stakeholders remain

informed about the latest market trends allowing them to respond promptly to changes and make data-driven decisions.

Next, identifies property types that exceed specific rental price thresholds and provides estimated rent ranges by state. This is particularly valuable in Malaysia where rental prices vary significantly between urban centers such as Kuala Lumpur, Penang, Johor Bahru and smaller towns or rural areas. For property organizations, these insights enable competitive pricing, strategic investment in high-demand properties and portfolio optimization to maximize profitability. For DOSM and policymakers, this data supports housing affordability studies, regional economic planning and the design of targeted subsidies or interventions in areas with rising rental costs.

Additionally, this project enhances negotiation and benchmarking processes. Accurate localized rent estimates strengthen discussions with clients, investors or tenants while enabling organizations to benchmark their performance against competitors within Malaysia. DOSM benefits from the automation of data collection and analysis which improves efficiency and ensures timeliness in reporting rental trends. This strengthens DOSM's ability to support national policy making and meet international reporting standards.

In summary, this project provides Malaysia and DOSM with a robust framework to improve the quality, timeliness, and utility of rental market data. It equips stakeholders

with practical tools to make informed decisions, optimize strategies for local needs, and ensure sustainable growth in the country's dynamic rental housing sector.

6.4 Way Forward

The rental house analysis would focus on rental price trends and influencing factors within one particular state, allowing for a more in-depth understanding of local market dynamics.

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8. Appendix

8.1 Data Table

The data table presents a summary of the average rental prices based on state, district, number of bedrooms, number of bathrooms, furniture type, and the posted date recorded between 1 June 2024 to 31 October 2024. In the data table, a dash (-) indicates that no data was retrieved during the date crawling.

Table 2: Summary of Average Rent Price by State recorded between 1 June 2024 to 31 October 2024

State	Property Type									
	Sewa Rumah Berkembar	Sewa Rumah Teres	Sewa Rumah Berangkai	Sewa Rumah Berkelompok	Sewa Rumah Bandar	Sewa Rumah Pangsa	Sewa Rumah Pangsapuri	Sewa Rumah Kondominium	Sewa Rumah Pangsapuri Khidmat	Sewa Rumah SOHO/SOFO/SOVO
Johor	3278	2299	4575	3475	2600	1010	1848	2079	2776	-
Kedah	1200	933	-	-	-	-	-	3500	-	-
Kelantan	-	-	-	-	-	-	-	-	-	-
Melaka	-	1237	-	-	1100	650	750	900	1000	-
Negeri Sembilan	1914	1539	1800	-	1100	450	1031	1494	1259	-
Pahang	4000	2925	-	-	-	-	-	-	2100	-
Perak	750	1557	-	-	2200	-	1383	1367	-	-
Perlis	-	-	-	-	-	-	-	-	-	-
Pulau Pinang	2980	1769	-	-	2200	831	1145	2307	1632	1000
Sabah	-	2750	-	-	2800	-	-	2000	-	-
Sarawak	1480	-	-	-	-	-	2525	2925	2900	-
Selangor	3116	2056	2200	2050	1942	842	1473	1964	2321	1512
Terengganu	-	-	-	-	-	-	-	-	-	-
W.P. Kuala Lumpur	4065	2531	-	-	3150	1028	1972	2741	2910	2200
W.P. Labuan	-	-	-	-	-	-	-	-	-	-
W.P. Putrajaya	3278	2299	4575	3475	2600	1010	1848	2079	2776	-

Table 3: Summary of Average Rent Price by District between 1 June 2024 to 31 October 2024

State	District	Property Type									
		Sewa Rumah Berkembar	Sewa Rumah Teres	Sewa Rumah Berangkai	Sewa Rumah Berkelompok	Sewa Rumah Bandar	Sewa Rumah Pangsa	Sewa Rumah Pangsapuri	Sewa Rumah Kondominium	Sewa Rumah Pangsapuri Khidmat	Sewa Rumah SOHO/SOFO/SOVO
Johor	Batu Pahat	-	-	-	-	-	-	680	-	-	-
	Johor Bahru	3457	2391	4575	3475	2833	1010	1903	2079	2795	-
	Kluang	-	650	-	-	-	-	-	-	-	-
	Kota Tinggi	-	-	-	-	-	-	-	-	-	-
	Mersing	-	-	-	-	-	-	-	-	-	-
	Muar	-	-	-	-	-	-	700	-	-	-
	Pontian	-	-	-	-	-	-	-	-	-	-
	Segamat	-	-	-	-	-	-	-	-	-	-
	Kulai	2650	1433	-	-	1200	-	2400	-	1750	-
	Tangkak	-	-	-	-	-	-	-	-	-	-
Kedah	Baling	-	-	-	-	-	-	-	-	-	-
	Bandar Baharu	-	-	-	-	-	-	-	-	-	-
	Kota Setar	-	-	-	-	-	-	-	-	-	-
	Kuala Muda	-	800	-	-	-	-	-	-	-	-
	Kubang Pasu	-	-	-	-	-	-	-	-	-	-
	Kulim	1200	999	-	-	-	-	-	-	-	-
	Langkawi	-	-	-	-	-	-	-	3500	-	-
	Padang Terap	-	-	-	-	-	-	-	-	-	-
	Sik	-	-	-	-	-	-	-	-	-	-
	Yan	-	-	-	-	-	-	-	-	-	-
	Pendang	-	-	-	-	-	-	-	-	-	-
	Pokok Sena	-	-	-	-	-	-	-	-	-	-
Kelantan	Bachok	-	-	-	-	-	-	-	-	-	-
	Kota Bharu	-	-	-	-	-	-	-	-	-	-
State	District	Property Type									

		Sewa Rumah Berkembar	Sewa Rumah Teres	Sewa Rumah Berangkai	Sewa Rumah Berkelompok	Sewa Rumah Bandar	Sewa Rumah Pangsa	Sewa Rumah Pangsapuri	Sewa Rumah Kondominium	Sewa Rumah Pangsapuri Khidmat	Sewa Rumah SOHO/SOFO/SOVO
State	District	Property Type									
	Machang	-	-	-	-	-	-	-	-	-	-
	Pasir Mas	-	-	-	-	-	-	-	-	-	-
	Pasir Puteh	-	-	-	-	-	-	-	-	-	-
	Tanah Merah	-	-	-	-	-	-	-	-	-	-
	Tumpat	-	-	-	-	-	-	-	-	-	-
	Gua Musang	-	-	-	-	-	-	-	-	-	-
	Kuala Krai	-	-	-	-	-	-	-	-	-	-
	Jeli	-	-	-	-	-	-	-	-	-	-
	Jajahan Kecil Lojing	-	-	-	-	-	-	-	-	-	-
Melaka	Alor Gajah	-	-	-	-	1100	-	-	-	-	-
	Jasin	-	1125	-	-	-	-	-	-	-	-
	Melaka Tengah	-	1350	-	-	-	650	750	900	1000	-
Negeri Sembilan	Jelebu	-	-	-	-	-	-	-	-	-	-
	Kuala Pilah	-	-	-	-	-	-	-	-	-	-
	Port Dickson	1700	-	-	-	-	-	-	-	-	-
	Rembau	-	-	-	-	-	-	-	-	-	-
	Seremban	1925	1539	1800	-	1100	450	1031	1494	1259	-
	Tampin	-	-	-	-	-	-	-	-	-	-
	Jempol	-	-	-	-	-	-	-	-	-	-
Pahang	Bentong	-	-	-	-	-	-	-	-	2100	-
	Cameron Highlands	-	-	-	-	-	-	-	-	-	-
	Jerantut	-	-	-	-	-	-	-	-	-	-
	Kuantan	4000	2925	-	-	-	-	-	-	-	-
	Lipis	-	-	-	-	-	-	-	-	-	-
	Pekan	-	-	-	-	-	-	-	-	-	-

		Sewa Rumah Berkembar	Sewa Rumah Teres	Sewa Rumah Berangkai	Sewa Rumah Berkelompok	Sewa Rumah Bandar	Sewa Rumah Pangsa	Sewa Rumah Pangsapuri	Sewa Rumah Kondominium	Sewa Rumah Pangsapuri Khidmat	Sewa Rumah SOHO/SOFO/SOVO
State	District	Property Type									
	Raub	-	-	-	-	-	-	-	-	-	-
	Temerloh	-	-	-	-	-	-	-	-	-	-
	Rompin	-	-	-	-	-	-	-	-	-	-
	Maran	-	-	-	-	-	-	-	-	-	-
	Bera	-	-	-	-	-	-	-	-	-	-
Pulau Pinang	Seberang Perai Tengah	1900	1416	-	-	-	825	1140	1650	1900	-
	Seberang Perai Utara	-	1716	-	-	-	1100	-	1406	1600	-
	Seberang Perai Selatan	3250	1983	-	-	2200	-	-	1817	1490	1000
	Timur Laut	-	1600	-	-	-	798	1117	1982	2282	-
	Barat Daya	-	3750	-	-	-	933	1267	2801	3400	-
Perak	Batang Padang	-	-	-	-	-	-	-	-	-	-
	Manjung	750	-	-	-	-	-	-	-	-	-
	Kinta	-	1557	-	-	2200	-	1383	1367	-	-
	Kerian	-	-	-	-	-	-	-	-	-	-
	Kuala Kangsar	-	-	-	-	-	-	-	-	-	-
	Larut Dan Matang	-	-	-	-	-	-	-	-	-	-
	Hilir Perak	-	-	-	-	-	-	-	-	-	-
	Hulu Perak	-	-	-	-	-	-	-	-	-	-
	Perak Tengah	-	-	-	-	-	-	-	-	-	-
	Kampar	-	-	-	-	-	-	-	-	-	-
	Muallim	-	-	-	-	-	-	-	-	-	-
	Bagan Datuk	-	-	-	-	-	-	-	-	-	-
	Selama	-	-	-	-	-	-	-	-	-	-

		Sewa Rumah Berkembar	Sewa Rumah Teres	Sewa Rumah Berangkai	Sewa Rumah Berkelompok	Sewa Rumah Bandar	Sewa Rumah Pangsa	Sewa Rumah Pangsapuri	Sewa Rumah Kondominium	Sewa Rumah Pangsapuri Khidmat	Sewa Rumah SOHO/SOFO/SIVO
State	District	Property Type									
Perlis	Perlis	-	-	-	-	-	-	-	-	-	-
Selangor	Gombak	-	2312	-	-	2850	933	965	1577	1496	-
	Klang	3267	1622	-	2000	-	783	1147	1705	2117	1533
	Kuala Langat	2631	1898	-	-	1500	767	1399	1676	1638	-
	Kuala Selangor	1300	1533	2200	1800	1300	-	1100	1160	-	-
	Petaling	3664	2331	-	-	1583	1009	1714	2148	2526	1573
	Sabak Bernam	-	-	-	-	-	-	-	-	-	-
	Sepang	2250	2281	-	-	2259	-	1471	1850	1556	1500
	Hulu Langat	3273	2174	-	2500	1317	678	1280	1641	1950	1299
	Hulu Selangor	-	-	-	-	-	500	-	-	-	-
Terengganu	Besut	-	-	-	-	-	-	-	-	-	-
	Dungun	-	-	-	-	-	-	-	-	-	-
	Kemaman	-	-	-	-	-	-	-	-	-	-
	Kuala Terengganu	-	-	-	-	-	-	-	-	-	-
	Marang	-	-	-	-	-	-	-	-	-	-
	Hulu Terengganu	-	-	-	-	-	-	-	-	-	-
	Setiu	-	-	-	-	-	-	-	-	-	-
	Kuala Nerus	-	-	-	-	-	-	-	-	-	-
Sabah	Tawau	-	2000	-	-	-	-	-	-	-	-
	Lahad Datu	-	-	-	-	-	-	-	-	-	-
	Semporna	-	-	-	-	-	-	-	-	-	-
	Sandakan	-	-	-	-	-	-	-	-	-	-
	Kinabatangan	-	-	-	-	-	-	-	-	-	-
	Beluran	-	-	-	-	-	-	-	-	-	-

		Sewa Rumah Berkembar	Sewa Rumah Teres	Sewa Rumah Berangkai	Sewa Rumah Berkelompok	Sewa Rumah Bandar	Sewa Rumah Pangsa	Sewa Rumah Pangsapuri	Sewa Rumah Kondominium	Sewa Rumah Pangsapuri Khidmat	Sewa Rumah SOHO/SOFO/SOVO
State	District	Property Type									
	Kota Kinabalu	-	3500	-	-	2800	-	-	2063	-	-
	Ranau	-	-	-	-	-	-	-	-	-	-
	Kota Belud	-	-	-	-	-	-	-	-	-	-
	Tuaran	-	-	-	-	-	-	-	-	-	-
	Penampang	-	-	-	-	-	-	-	1750	-	-
	Papar	-	-	-	-	-	-	-	-	-	-
	Kudat	-	-	-	-	-	-	-	-	-	-
	Kota Marudu	-	-	-	-	-	-	-	-	-	-
	Pitas	-	-	-	-	-	-	-	-	-	-
	Beaufort	-	-	-	-	-	-	-	-	-	-
	Kuala Penyu	-	-	-	-	-	-	-	-	-	-
	Sipitang	-	-	-	-	-	-	-	-	-	-
	Tenom	-	-	-	-	-	-	-	-	-	-
	Nabawan	-	-	-	-	-	-	-	-	-	-
	Keningau	-	-	-	-	-	-	-	-	-	-
	Tambunan	-	-	-	-	-	-	-	-	-	-
	Kunak	-	-	-	-	-	-	-	-	-	-
	Tongod	-	-	-	-	-	-	-	-	-	-
	Putatan	-	-	-	-	-	-	-	-	-	-
	Telupid	-	-	-	-	-	-	-	-	-	-
	Kalabakan	-	-	-	-	-	-	-	-	-	-
	Membakut	-	-	-	-	-	-	-	-	-	-
Sarawak	Kuching	-	-	-	-	-	-	2525	2925	2900	-
	Bau	-	-	-	-	-	-	-	-	-	-
	Lundu	-	-	-	-	-	-	-	-	-	-
	Samarahan	-	-	-	-	-	-	-	-	-	-
	Serian	-	-	-	-	-	-	-	-	-	-

		Sewa Rumah Berkembar	Sewa Rumah Teres	Sewa Rumah Berangkai	Sewa Rumah Berkelompok	Sewa Rumah Bandar	Sewa Rumah Pangsa	Sewa Rumah Pangsapuri	Sewa Rumah Kondominium	Sewa Rumah Pangsapuri Khidmat	Sewa Rumah SOHO/SOFO/SOVO
State	District	Property Type									
	Simunjan	-	-	-	-	-	-	-	-	-	-
	Sri Aman	-	-	-	-	-	-	-	-	-	-
	Lubok Antu	-	-	-	-	-	-	-	-	-	-
	Betong	-	-	-	-	-	-	-	-	-	-
	Saratok	-	-	-	-	-	-	-	-	-	-
	Sarikei	-	-	-	-	-	-	-	-	-	-
	Maradong	-	-	-	-	-	-	-	-	-	-
	Daro	-	-	-	-	-	-	-	-	-	-
	Julau	-	-	-	-	-	-	-	-	-	-
	Sibu	-	-	-	-	-	-	-	-	-	-
	Dalat	-	-	-	-	-	-	-	-	-	-
	Mukah	-	-	-	-	-	-	-	-	-	-
	Kanowit	-	-	-	-	-	-	-	-	-	-
	Bintulu	-	-	-	-	-	-	-	-	-	-
	Tatau	-	-	-	-	-	-	-	-	-	-
	Kapit	-	-	-	-	-	-	-	-	-	-
	Song	-	-	-	-	-	-	-	-	-	-
	Belaga	-	-	-	-	-	-	-	-	-	-
	Miri	1480	-	-	-	-	-	-	-	-	-
	Marudi	-	-	-	-	-	-	-	-	-	-
	Limbang	-	-	-	-	-	-	-	-	-	-
	Lawas	-	-	-	-	-	-	-	-	-	-
	Matu	-	-	-	-	-	-	-	-	-	-
	Asajaya	-	-	-	-	-	-	-	-	-	-
	Pakan	-	-	-	-	-	-	-	-	-	-
	Selangau	-	-	-	-	-	-	-	-	-	-
	Tebedu	-	-	-	-	-	-	-	-	-	-
	Pusa	-	-	-	-	-	-	-	-	-	-
	Kabong	-	-	-	-	-	-	-	-	-	-

		Sewa Rumah Berkembar	Sewa Rumah Teres	Sewa Rumah Berangkai	Sewa Rumah Berkelompok	Sewa Rumah Bandar	Sewa Rumah Pangsa	Sewa Rumah Pangsapuri	Sewa Rumah Kondominium	Sewa Rumah Pangsapuri Khidmat	Sewa Rumah SOHO/SOFO/SOVO
	Tanjung Manis	-	-	-	-	-	-	-	-	-	-
	Sebauh	-	-	-	-	-	-	-	-	-	-
	Bukit Mabong	-	-	-	-	-	-	-	-	-	-
	Subis	-	-	-	-	-	-	-	-	-	-
	Beluru	-	-	-	-	-	-	-	-	-	-
	Telang Usan	-	-	-	-	-	-	-	-	-	-
	Gedong	-	-	-	-	-	-	-	-	-	-
	Sebuyau	-	-	-	-	-	-	-	-	-	-
	Siburan	-	-	-	-	-	-	-	-	-	-
	Pantu	-	-	-	-	-	-	-	-	-	-
	Lingga	-	-	-	-	-	-	-	-	-	-
W.P. Kuala Lumpur	W.P. Kuala Lumpur	4065	2531	-	-	3150	1028	1972	2741	2910	2200
W.P. Labuan	W.P. Labuan	-	-	-	-	-	-	-	-	-	-
W.P. Putrajaya	W.P. Putrajaya	5000	-	-	-	-	-	1538	2162	1898	-

Table 4: Summary of Average Rent Price by Number of Bedrooms recorded between 1 June 2024 to 31 October 2024

Bedroom	State	Property Type									
		Sewa Rumah Berkembar	Sewa Rumah Teres	Sewa Rumah Berangkai	Sewa Rumah Berkelompok	Sewa Rumah Bandar	Sewa Rumah Pangsa	Sewa Rumah Pangsapuri	Sewa Rumah Kondominium	Sewa Rumah Pangsapuri Khidmat	Sewa Rumah SOHO/SOFO /SOVO
1-Bedroom	Johor	-	-	-	-	-	-	1606	1551	2061	-
	Kedah	-	-	-	-	-	-	-	-	-	-
	Kelantan	-	-	-	-	-	-	-	-	-	-
	Melaka	-	-	-	-	-	-	-	-	-	-
	Negeri Sembilan	-	-	-	-	-	-	800	551	-	-
	Pahang	-	-	-	-	-	-	-	-	-	-
	Perak	-	-	-	-	-	-	-	-	-	-
	Perlis	-	-	-	-	-	-	-	-	-	-
	Pulau Pinang	-	-	-	-	-	560	-	1569	-	-
	Sabah	-	-	-	-	-	-	-	-	-	-
	Sarawak	-	-	-	-	-	-	-	-	-	-
	Selangor	-	-	-	-	-	800	1827	1418	1651	1511
	Terengganu	-	-	-	-	-	-	-	-	-	-
	W.P. Kuala Lumpur	-	675	-	-	-	2000	2177	2327	2777	1810
	W.P. Labuan	-	-	-	-	-	-	-	-	-	-
	W.P. Putrajaya	-	-	-	-	-	-	-	1900	-	-
2-Bedroom	Johor	-	925	-	-	-	800	2157	1904	2680	-
	Kedah	-	-	-	-	-	-	-	3500	-	-
	Kelantan	-	-	-	-	-	-	-	-	-	-
	Melaka	-	-	-	-	-	650	-	699	-	-
	Negeri Sembilan	-	-	-	-	-	-	1080	1192	1200	-
	Pahang	-	700	-	-	-	-	-	-	2500	-
	Perak	-	-	-	-	-	-	-	1150	-	-
	Perlis	-	-	-	-	-	-	-	-	-	-
	Pulau Pinang	-	-	-	-	-	685	762	3044	1672	-

Bedroom	State	Property Type									
		Sewa Rumah Berkembar	Sewa Rumah Teres	Sewa Rumah Berangkai	Sewa Rumah Berkelompok	Sewa Rumah Bandar	Sewa Rumah Pangsa	Sewa Rumah Pangsapuri	Sewa Rumah Kondominium	Sewa Rumah Pangsapuri Khidmat	Sewa Rumah SOHO/SOFO /SOVO
	Sabah	-	-	-	-	-	-	-	2600	-	-
	Sarawak	-	-	-	-	-	-	1700	2150	2350	-
	Selangor	-	1730	-	-	-	562	2777	2151	2420	1800
	Terengganu	-	-	-	-	-	-	-	-	-	-
	W.P. Kuala Lumpur	-	1467	-	-	-	931	2046	2895	2918	-
	W.P. Labuan	-	-	-	-	-	-	-	-	-	-
	W.P. Putrajaya	-	-	-	-	-	-	-	-	1838	-
3-Bedroom	Johor	3500	1740	-	-	2600	1063	1679	2280	3356	-
	Kedah	1200	999	-	-	-	-	-	-	-	-
	Kelantan	-	-	-	-	-	-	-	-	-	-
	Melaka	-	1150	-	-	1100	-	750	1000	1000	-
	Negeri Sembilan	2200	1303	-	-	1100	450	850	1712	1950	-
	Pahang	-	1000	-	-	-	-	-	-	-	-
	Perak	750	1500	-	-	2200	-	1383	1475	-	-
	Perlis	-	-	-	-	-	-	-	-	-	-
	Pulau Pinang	-	1019	-	-	2200	916	1222	2115	1748	-
	Sabah	-	-	-	-	2800	-	-	1757	-	-
	Sarawak	1480	-	-	-	-	-	2800	3600	3450	-
	Selangor	3200	1518	-	-	1829	904	1205	1890	2762	-
	Terengganu	-	-	-	-	-	-	-	-	-	-
	W.P. Kuala Lumpur	-	1800	-	-	1500	1094	1773	2443	3026	4800
	W.P. Labuan	-	-	-	-	-	-	-	-	-	-
	W.P. Putrajaya	-	-	-	-	-	-	1450	2157	2500	-
4-Bedroom	Johor	3200	2463	5000	3650	-	-	2050	2542	4000	-
	Kedah	-	800	-	-	-	-	-	-	-	-
	Kelantan	-	-	-	-	-	-	-	-	-	-

Bedroom	State	Property Type									
		Sewa Rumah Berkembar	Sewa Rumah Teres	Sewa Rumah Berangkai	Sewa Rumah Berkelompok	Sewa Rumah Bandar	Sewa Rumah Pangsa	Sewa Rumah Pangsapuri	Sewa Rumah Kondominium	Sewa Rumah Pangsapuri Khidmat	Sewa Rumah SOHO/SOFO /SOVO
	Melaka	-	1500	-	-	-	-	-	-	-	-
	Negeri Sembilan	1810	1579	1800	-	-	-	2100	2140	-	-
	Pahang	4000	-	-	-	-	-	-	-	-	-
	Perak	-	1580	-	-	-	-	-	-	-	-
	Perlis	-	-	-	-	-	-	-	-	-	-
	Pulau Pinang	2850	2058	-	-	-	-	-	2794	1650	-
	Sabah	-	2000	-	-	-	-	-	2500	-	-
	Sarawak	-	-	-	-	-	-	-	3800	-	-
	Selangor	2685	2028	2200	2100	2433	310	1800	2360	2984	-
	Terengganu	-	-	-	-	-	-	-	-	-	-
	W.P. Kuala Lumpur	4467	2493	-	-	-	-	2064	2878	3215	-
	W.P. Labuan	-	-	-	-	-	-	-	-	-	-
	W.P. Putrajaya	-	-	-	-	-	-	1800	2500	-	-
5-Bedroom	Johor	4500	3167	-	2600	-	-	-	4200	-	-
	Kedah	-	-	-	-	-	-	-	-	-	-
	Kelantan	-	-	-	-	-	-	-	-	-	-
	Melaka	-	-	-	-	-	-	-	-	-	-
	Negeri Sembilan	1780	2533	-	-	-	-	-	-	-	-
	Pahang	-	-	-	-	-	-	-	-	-	-
	Perak	-	-	-	-	-	-	-	-	-	-
	Perlis	-	-	-	-	-	-	-	-	-	-
	Pulau Pinang	3500	2000	-	-	-	-	-	-	-	-
	Sabah	-	3500	-	-	-	-	-	-	-	-
	Sarawak	-	-	-	-	-	-	-	-	-	-
	Selangor	3567	3188	-	-	-	950	1900	2450	-	-
	Terengganu	-	-	-	-	-	-	-	-	-	-

Bedroom	State	Property Type									
		Sewa Rumah Berkembar	Sewa Rumah Teres	Sewa Rumah Berangkai	Sewa Rumah Berkelompok	Sewa Rumah Bandar	Sewa Rumah Pangsa	Sewa Rumah Pangsapuri	Sewa Rumah Kondominium	Sewa Rumah Pangsapuri Khidmat	Sewa Rumah SOHO/SOFO /SOVO
	W.P. Kuala Lumpur	3575	3090	-	-	-	1500	-	2674	2790	-
	W.P. Labuan	-	-	-	-	-	-	-	-	-	-
	W.P. Putrajaya	-	-	-	-	-	-	-	-	-	-
6-Bedroom	Johor	2000	-	3300	-	-	-	-	-	-	-
	Kedah	-	-	-	-	-	-	-	-	-	-
	Kelantan	-	-	-	-	-	-	-	-	-	-
	Melaka	-	-	-	-	-	-	-	-	-	-
	Negeri Sembilan	-	-	-	-	-	-	-	-	-	-
	Pahang	-	5000	-	-	-	-	-	-	-	-
	Perak	-	-	-	-	-	-	-	-	-	-
	Perlis	-	-	-	-	-	-	-	-	-	-
	Pulau Pinang	-	-	-	-	-	-	-	-	-	-
	Sabah	-	-	-	-	-	-	-	-	-	-
	Sarawak	-	-	-	-	-	-	-	-	-	-
	Selangor	3500	2883	-	-	-	-	-	3500	-	-
	Terengganu	-	-	-	-	-	-	-	-	-	-
	W.P. Kuala Lumpur	-	4214	-	-	-	-	-	-	-	-
	W.P. Labuan	-	-	-	-	-	-	-	-	-	-
	W.P. Putrajaya	-	-	-	-	-	-	-	-	-	-
7-Bedroom	Johor	-	-	-	-	-	-	-	-	-	-
	Kedah	-	-	-	-	-	-	-	-	-	-
	Kelantan	-	-	-	-	-	-	-	-	-	-
	Melaka	-	-	-	-	-	-	-	-	-	-
	Negeri Sembilan	-	-	-	-	-	-	-	-	-	-
	Pahang	-	-	-	-	-	-	-	-	-	-

	Perak	-	-	-	-	-	-	-	-	-	-	-
Bedroom	State	Property Type										
		Sewa Rumah Berkembar	Sewa Rumah Teres	Sewa Rumah Berangkai	Sewa Rumah Berkelompok	Sewa Rumah Bandar	Sewa Rumah Pangsa	Sewa Rumah Pangsapuri	Sewa Rumah Kondominium	Sewa Rumah Pangsapuri Khidmat	Sewa Rumah SOHO/SOFO /SOVO	
	Perlis	-	-	-	-	-	-	-	-	-	-	-
	Pulau Pinang	-	-	-	-	-	-	-	-	-	-	-
	Sabah	-	-	-	-	-	-	-	-	-	-	-
	Sarawak	-	-	-	-	-	-	-	-	-	-	-
	Selangor	-	-	-	-	-	-	-	-	-	-	-
	Terengganu	-	-	-	-	-	-	-	-	-	-	-
	W.P. Kuala Lumpur	-	-	-	-	-	-	-	-	-	-	-
	W.P. Labuan	-	-	-	-	-	-	-	-	-	-	-
	W.P. Putrajaya	-	-	-	-	-	-	-	-	-	-	-
8-Bedroom	Johor	-	-	-	-	-	-	-	-	-	-	-
	Kedah	-	-	-	-	-	-	-	-	-	-	-
	Kelantan	-	-	-	-	-	-	-	-	-	-	-
	Melaka	-	-	-	-	-	-	-	-	-	-	-
	Negeri Sembilan	-	-	-	-	-	-	-	-	-	-	-
	Pahang	-	-	-	-	-	-	-	-	-	-	-
	Perak	-	-	-	-	-	-	-	-	-	-	-
	Perlis	-	-	-	-	-	-	-	-	-	-	-
	Pulau Pinang	-	-	-	-	-	-	-	-	-	-	-
	Sabah	-	-	-	-	-	-	-	-	-	-	-
	Sarawak	-	-	-	-	-	-	-	-	-	-	-
	Selangor	-	-	-	-	-	-	-	-	-	-	-
	Terengganu	-	-	-	-	-	-	-	-	-	-	-
	W.P. Kuala Lumpur	-	-	-	-	-	-	-	-	-	-	-
	W.P. Labuan	-	-	-	-	-	-	-	-	-	-	-
	W.P. Putrajaya	-	-	-	-	-	-	-	-	-	-	-

Bedroom	State	Property Type									
		Sewa Rumah Berkembar	Sewa Rumah Teres	Sewa Rumah Berangkai	Sewa Rumah Berkelompok	Sewa Rumah Bandar	Sewa Rumah Pangsa	Sewa Rumah Pangsapuri	Sewa Rumah Kondominium	Sewa Rumah Pangsapuri Khidmat	Sewa Rumah SOHO/SOFO /SOVO
9-Bedroom	Johor	-	-	-	-	-	-	-	-	-	-
	Kedah	-	-	-	-	-	-	-	-	-	-
	Kelantan	-	-	-	-	-	-	-	-	-	-
	Melaka	-	-	-	-	-	-	-	-	-	-
	Negeri Sembilan	-	-	-	-	-	-	-	-	-	-
	Pahang	-	-	-	-	-	-	-	-	-	-
	Perak	-	-	-	-	-	-	-	-	-	-
	Perlis	-	-	-	-	-	-	-	-	-	-
	Pulau Pinang	-	-	-	-	-	-	-	-	-	-
	Sabah	-	-	-	-	-	-	-	-	-	-
	Sarawak	-	-	-	-	-	-	-	-	-	-
	Selangor	-	-	-	-	-	-	-	-	-	-
	Terengganu	-	-	-	-	-	-	-	-	-	-
	W.P. Kuala Lumpur	-	-	-	-	-	-	-	-	-	-
	W.P. Labuan	-	-	-	-	-	-	-	-	-	-
	W.P. Putrajaya	-	-	-	-	-	-	-	-	-	-
10-Bedroom	Johor	-	-	-	-	-	-	-	-	-	-
	Kedah	-	-	-	-	-	-	-	-	-	-
	Kelantan	-	-	-	-	-	-	-	-	-	-
	Melaka	-	-	-	-	-	-	-	-	-	-
	Negeri Sembilan	-	-	-	-	-	-	-	-	-	-
	Pahang	-	-	-	-	-	-	-	-	-	-
	Perak	-	-	-	-	-	-	-	-	-	-
	Perlis	-	-	-	-	-	-	-	-	-	-
	Pulau Pinang	-	-	-	-	-	-	-	-	-	-
	Sabah	-	-	-	-	-	-	-	-	-	-
	Sarawak	-	-	-	-	-	-	-	-	-	-

Bedroom	State	Property Type									
		Sewa Rumah Berkembar	Sewa Rumah Teres	Sewa Rumah Berangkai	Sewa Rumah Berkelompok	Sewa Rumah Bandar	Sewa Rumah Pangsa	Sewa Rumah Pangsapuri	Sewa Rumah Kondominium	Sewa Rumah Pangsapuri Khidmat	Sewa Rumah SOHO/SOFO /SOVO
	Selangor	-	-	-	-	-	-	-	-	-	-
	Terengganu	-	-	-	-	-	-	-	-	-	-
	W.P. Kuala Lumpur	-	-	-	-	-	-	-	-	-	-
	W.P. Labuan	-	-	-	-	-	-	-	-	-	-
	W.P. Putrajaya	-	-	-	-	-	-	-	-	-	-
Studio	Johor	-	-	-	-	-	-	1500	1700	2127	-
	Kedah	-	-	-	-	-	-	-	-	-	-
	Kelantan	-	-	-	-	-	-	-	-	-	-
	Melaka	-	-	-	-	-	-	-	-	-	-
	Negeri Sembilan	-	-	-	-	-	-	-	-	1100	-
	Pahang	-	-	-	-	-	-	-	-	1700	-
	Perak	-	-	-	-	-	-	-	-	-	-
	Perlis	-	-	-	-	-	-	-	-	-	-
	Pulau Pinang	-	-	-	-	-	-	-	1700	978	-
	Sabah	-	-	-	-	-	-	-	-	-	-
	Sarawak	-	-	-	-	-	-	-	-	-	-
	Selangor	-	-	-	-	-	-	3375	2622	1711	-
	Terengganu	-	-	-	-	-	-	-	-	-	-
	W.P. Kuala Lumpur	-	-	-	-	-	-	2160	1431	1885	-
	W.P. Labuan	-	-	-	-	-	-	-	-	-	-
	W.P. Putrajaya	-	-	-	-	-	-	-	-	-	-

Table 5: Summary of Average Rent Price by Number of Bathrooms recorded between 1 June 2024 to 31 October 2024

Bathroom	State	Property Type									
		Sewa Rumah Berkembar	Sewa Rumah Teres	Sewa Rumah Berangkai	Sewa Rumah Berkelompok	Sewa Rumah Bandar	Sewa Rumah Pangsa	Sewa Rumah Pangsapuri	Sewa Rumah Kondominium	Sewa Rumah Pangsapuri Khidmat	Sewa Rumah SOHO/SOFO/SOVO
1-Bathroom	Johor	-	1490	-	-	-	800	1663	1429	2336	-
	Kedah	-	999	-	-	-	-	-	-	-	-
	Kelantan	-	-	-	-	-	-	-	-	-	-
	Melaka	-	-	-	-	-	650	-	-	-	-
	Negeri Sembilan	1500	1229	-	-	-	-	800	876	1100	-
	Pahang	-	-	-	-	-	-	-	-	1700	-
	Perak	-	-	-	-	-	-	-	1200	-	-
	Perlis	-	-	-	-	-	-	-	-	-	-
	Pulau Pinang	1900	1333	-	-	-	687	870	1998	1145	1000
	Sabah	-	-	-	-	-	-	-	2600	-	-
	Sarawak	-	-	-	-	-	-	-	-	2000	-
	Selangor	-	1525	-	-	-	705	1880	1629	1966	1536
	Terengganu	-	-	-	-	-	-	-	-	-	-
	W.P. Kuala Lumpur	-	1070	-	-	-	934	2277	2309	2693	1810
	W.P. Labuan	-	-	-	-	-	-	-	-	-	-
	W.P. Putrajaya	-	-	-	-	-	-	-	1900	1838	-
2-Bathroom	Johor	3267	1982	-	-	1200	1063	1958	2197	3043	-
	Kedah	1200	800	-	-	-	-	-	3500	-	-
	Kelantan	-	-	-	-	-	-	-	-	-	-
	Melaka	-	1150	-	-	1100	-	750	900	1000	-
	Negeri Sembilan	2200	1340	-	-	1100	-	1146	1544	1275	-
	Pahang	-	850	-	-	-	-	-	-	2500	-
	Perak	750	1500	-	-	-	-	1383	1382	-	-
	Perlis	-	-	-	-	-	-	-	-	-	-

Bathroom	State	Property Type									
		Sewa Rumah Berkembar	Sewa Rumah Teres	Sewa Rumah Berangkai	Sewa Rumah Berkelompok	Sewa Rumah Bandar	Sewa Rumah Pangsa	Sewa Rumah Pangsapuri	Sewa Rumah Kondominium	Sewa Rumah Pangsapuri Khidmat	Sewa Rumah SOHO/SOFO/SOVO
	Pulau Pinang	-	1079	-	-	2200	902	1270	2282	1674	-
	Sabah	-	-	-	-	-	-	-	1929	-	-
	Sarawak	1480	-	-	-	-	-	2367	2633	3200	-
	Selangor	3200	1491	-	-	1417	896	1396	1986	2607	1400
	Terengganu	-	-	-	-	-	-	-	-	-	-
	W.P. Kuala Lumpur	-	1755	-	-	1500	1264	1865	2673	2945	-
	W.P. Labuan	-	-	-	-	-	-	-	-	-	-
	W.P. Putrajaya	-	-	-	-	-	-	1450	2058	2500	-
3-Bathroom	Johor	2500	2407	-	-	2475	-	2700	2912	3733	-
	Kedah	-	-	-	-	-	-	-	-	-	-
	Kelantan	-	-	-	-	-	-	-	-	-	-
	Melaka	-	1500	-	-	-	-	-	-	-	-
	Negeri Sembilan	1733	1536	1800	-	-	450	-	1600	-	-
	Pahang	4000	5000	-	-	-	-	-	-	-	-
	Perak	-	1700	-	-	-	-	-	-	-	-
	Perlis	-	-	-	-	-	-	-	-	-	-
	Pulau Pinang	2500	1713	-	-	-	-	900	2870	2138	-
	Sabah	-	2750	-	-	2800	-	-	1300	-	-
	Sarawak	-	-	-	-	-	-	3000	3800	-	-
	Selangor	2650	2038	2200	1800	2321	800	1546	2504	3654	-
	Terengganu	-	-	-	-	-	-	-	-	-	-
	W.P. Kuala Lumpur	3100	2556	-	-	4800	-	2289	3384	3696	4800
	W.P. Labuan	-	-	-	-	-	-	-	-	-	-
	W.P. Putrajaya	-	-	-	-	-	-	1800	2700	-	-

Bathroom	State	Property Type									
		Sewa Rumah Berkembar	Sewa Rumah Teres	Sewa Rumah Berangkai	Sewa Rumah Berkelompok	Sewa Rumah Bandar	Sewa Rumah Pangsa	Sewa Rumah Pangsapuri	Sewa Rumah Kondominium	Sewa Rumah Pangsapuri Khidmat	Sewa Rumah SOHO/SOFO/SOVO
4-Bathroom	Johor	3567	3100	5000	3050	3550	-	-	3375	4300	-
	Kedah	-	-	-	-	-	-	-	-	-	-
	Kelantan	-	-	-	-	-	-	-	-	-	-
	Melaka	-	-	-	-	-	-	-	-	-	-
	Negeri Sembilan	1500	1726	-	-	-	-	-	-	-	-
	Pahang	-	-	-	-	-	-	-	-	-	-
	Perak	-	1100	-	-	2200	-	-	-	-	-
	Perlis	-	-	-	-	-	-	-	-	-	-
	Pulau Pinang	3500	2817	-	-	-	-	-	3820	4200	-
	Sabah	-	-	-	-	-	-	-	-	-	-
	Sarawak	-	-	-	-	-	-	-	-	-	-
	Selangor	2444	2291	-	2100	4400	-	-	3247	-	-
	Terengganu	-	-	-	-	-	-	-	-	-	-
	W.P. Kuala Lumpur	4600	3000	-	-	-	-	1225	4007	3695	-
	W.P. Labuan	-	-	-	-	-	-	-	-	-	-
	W.P. Putrajaya	-	-	-	-	-	-	-	-	-	-
5-Bathroom	Johor	3250	2800	3300	3617	-	-	-	4200	4500	-
	Kedah	-	-	-	-	-	-	-	-	-	-
	Kelantan	-	-	-	-	-	-	-	-	-	-
	Melaka	-	-	-	-	-	-	-	-	-	-
	Negeri Sembilan	3200	2900	-	-	-	-	-	-	-	-
	Pahang	-	-	-	-	-	-	-	-	-	-
	Perak	-	-	-	-	-	-	-	-	-	-
	Perlis	-	-	-	-	-	-	-	-	-	-
	Pulau Pinang	-	2300	-	-	-	-	-	3500	-	-

Bathroom	State	Property Type									
		Sewa Rumah Berkembar	Sewa Rumah Teres	Sewa Rumah Berangkai	Sewa Rumah Berkelompok	Sewa Rumah Bandar	Sewa Rumah Pangsa	Sewa Rumah Pangsapuri	Sewa Rumah Kondominium	Sewa Rumah Pangsapuri Khidmat	Sewa Rumah SOHO/SOFO/SOVO
	Sabah	-	-	-	-	-	-	-	-	-	-
	Sarawak	-	-	-	-	-	-	-	-	-	-
	Selangor	3725	4123	-	-	-	-	-	2938	-	-
	Terengganu	-	-	-	-	-	-	-	-	-	-
	W.P. Kuala Lumpur	3886	4225	-	-	-	-	-	4555	-	-
	W.P. Labuan	-	-	-	-	-	-	-	-	-	-
	W.P. Putrajaya	-	-	-	-	-	-	-	-	-	-
6-Bathroom	Johor	-	-	-	-	-	-	-	-	-	-
	Kedah	-	-	-	-	-	-	-	-	-	-
	Kelantan	-	-	-	-	-	-	-	-	-	-
	Melaka	-	-	-	-	-	-	-	-	-	-
	Negeri Sembilan	-	-	-	-	-	-	-	-	-	-
	Pahang	-	-	-	-	-	-	-	-	-	-
	Perak	-	-	-	-	-	-	-	-	-	-
	Perlis	-	-	-	-	-	-	-	-	-	-
	Pulau Pinang	3500	-	-	-	-	-	-	-	-	-
	Sabah	-	-	-	-	-	-	-	-	-	-
	Sarawak	-	-	-	-	-	-	-	-	-	-
	Selangor	4667	3917	-	-	-	-	-	-	-	-
	Terengganu	-	-	-	-	-	-	-	-	-	-
	W.P. Kuala Lumpur	5000	4500	-	-	-	-	-	-	-	-
	W.P. Labuan	-	-	-	-	-	-	-	-	-	-
	W.P. Putrajaya	5000	-	-	-	-	-	-	-	-	-
7-Bathroom	Johor	-	-	-	-	-	-	-	-	-	-

	Kedah	-	-	-	-	-	-	-	-	-	-
Bathroom	State	Property Type									
		Sewa Rumah Berkembar	Sewa Rumah Teres	Sewa Rumah Berangkai	Sewa Rumah Berkelompok	Sewa Rumah Bandar	Sewa Rumah Pangsa	Sewa Rumah Pangsapuri	Sewa Rumah Kondominium	Sewa Rumah Pangsapuri Khidmat	Sewa Rumah SOHO/SOFO/SOVO
	Kelantan	-	-	-	-	-	-	-	-	-	-
	Melaka	-	-	-	-	-	-	-	-	-	-
	Negeri Sembilan	-	-	-	-	-	-	-	-	-	-
	Pahang	-	-	-	-	-	-	-	-	-	-
	Perak	-	-	-	-	-	-	-	-	-	-
	Perlis	-	-	-	-	-	-	-	-	-	-
	Pulau Pinang	-	-	-	-	-	-	-	-	-	-
	Sabah	-	-	-	-	-	-	-	-	-	-
	Sarawak	-	-	-	-	-	-	-	-	-	-
	Selangor	-	-	-	-	-	-	-	-	-	-
	Terengganu	-	-	-	-	-	-	-	-	-	-
	W.P. Kuala Lumpur	-	-	-	-	-	-	-	-	-	-
	W.P. Labuan	-	-	-	-	-	-	-	-	-	-
	W.P. Putrajaya	-	-	-	-	-	-	-	-	-	-
8-Bathroom	Johor	-	-	-	-	-	-	-	-	-	-
	Kedah	-	-	-	-	-	-	-	-	-	-
	Kelantan	-	-	-	-	-	-	-	-	-	-
	Melaka	-	-	-	-	-	-	-	-	-	-
	Negeri Sembilan	-	-	-	-	-	-	-	-	-	-
	Pahang	-	-	-	-	-	-	-	-	-	-
	Perak	-	-	-	-	-	-	-	-	-	-
	Perlis	-	-	-	-	-	-	-	-	-	-
	Pulau Pinang	-	-	-	-	-	-	-	-	-	-
	Sabah	-	-	-	-	-	-	-	-	-	-

	Sarawak	-	-	-	-	-	-	-	-	-	-	-
Bathroom	State	Property Type										
		Sewa Rumah Berkembar	Sewa Rumah Teres	Sewa Rumah Berangkai	Sewa Rumah Berkelompok	Sewa Rumah Bandar	Sewa Rumah Pangsa	Sewa Rumah Pangsapuri	Sewa Rumah Kondominium	Sewa Rumah Pangsapuri Khidmat	Sewa Rumah SOHO/SOFO/SOVO	
	Selangor	-	-	-	-	-	-	-	-	-	-	-
	Terengganu	-	-	-	-	-	-	-	-	-	-	-
	W.P. Kuala Lumpur	-	-	-	-	-	-	-	-	-	-	-
	W.P. Labuan	-	-	-	-	-	-	-	-	-	-	-
	W.P. Putrajaya	-	-	-	-	-	-	-	-	-	-	-
9-Bathroom	Johor	-	-	-	-	-	-	-	-	-	-	-
	Kedah	-	-	-	-	-	-	-	-	-	-	-
	Kelantan	-	-	-	-	-	-	-	-	-	-	-
	Melaka	-	-	-	-	-	-	-	-	-	-	-
	Negeri Sembilan	-	-	-	-	-	-	-	-	-	-	-
	Pahang	-	-	-	-	-	-	-	-	-	-	-
	Perak	-	-	-	-	-	-	-	-	-	-	-
	Perlis	-	-	-	-	-	-	-	-	-	-	-
	Pulau Pinang	-	-	-	-	-	-	-	-	-	-	-
	Sabah	-	-	-	-	-	-	-	-	-	-	-
	Sarawak	-	-	-	-	-	-	-	-	-	-	-
	Selangor	-	-	-	-	-	-	-	-	-	-	-
	Terengganu	-	-	-	-	-	-	-	-	-	-	-
	W.P. Kuala Lumpur	-	-	-	-	-	-	-	-	-	-	-
	W.P. Labuan	-	-	-	-	-	-	-	-	-	-	-
	W.P. Putrajaya	-	-	-	-	-	-	-	-	-	-	-
10-Bathroom	Johor	-	-	-	-	-	-	-	-	-	-	-
	Kedah	-	-	-	-	-	-	-	-	-	-	-
	Kelantan	-	-	-	-	-	-	-	-	-	-	-

	Melaka	-	-	-	-	-	-	-	-	-	-	-
Bathroom	State	Property Type										
		Sewa Rumah Berkembar	Sewa Rumah Teres	Sewa Rumah Berangkai	Sewa Rumah Berkelompok	Sewa Rumah Bandar	Sewa Rumah Pangsa	Sewa Rumah Pangsapuri	Sewa Rumah Kondominium	Sewa Rumah Pangsapuri Khidmat	Sewa Rumah SOHO/SOFO/SOVO	
	Negeri Sembilan	-	-	-	-	-	-	-	-	-	-	
	Pahang	-	-	-	-	-	-	-	-	-	-	
	Perak	-	-	-	-	-	-	-	-	-	-	
	Perlis	-	-	-	-	-	-	-	-	-	-	
	Pulau Pinang	-	-	-	-	-	-	-	-	-	-	
	Sabah	-	-	-	-	-	-	-	-	-	-	
	Sarawak	-	-	-	-	-	-	-	-	-	-	
	Selangor	-	-	-	-	-	-	-	-	-	-	
	Terengganu	-	-	-	-	-	-	-	-	-	-	
	W.P. Kuala Lumpur	-	-	-	-	-	-	-	-	-	-	
	W.P. Labuan	-	-	-	-	-	-	-	-	-	-	
	W.P. Putrajaya	-	-	-	-	-	-	-	-	-	-	

Table 6: Summary of Average Rent Price by Furnishing Type recorded between 1 June 2024 to 31 October 2024

State	Furniture Type	Property Type									
		Sewa Rumah Berkembar	Sewa Rumah Teres	Sewa Rumah Berangkai	Sewa Rumah Berkelompok	Sewa Rumah Bandar	Sewa Rumah Pangsa	Sewa Rumah Pangsapuri	Sewa Rumah Kondominium	Sewa Rumah Pangsapuri Khidmat	Sewa Rumah SOHO/SOFO/SOVO
Johor	Fully Furnished	3600	3017	-	4300	2740	-	1941	2130	2799	-
	Partially Furnished	3180	2095	5000	3075	2250	1100	1382	1777	3150	-
	Unfurnished	2800	2014	-	-	-	951	1300	1320	-	-
Kedah	Fully Furnished	-	-	-	-	-	-	-	3500	-	-
	Partially Furnished	1200	800	-	-	-	-	-	-	-	-
	Unfurnished	-	999	-	-	-	-	-	-	-	-
Kelantan	Fully Furnished	-	-	-	-	-	-	-	-	-	-
	Partially Furnished	-	-	-	-	-	-	-	-	-	-
	Unfurnished	-	-	-	-	-	-	-	-	-	-
Melaka	Fully Furnished	-	1350	-	-	1100	-	750	699	1000	-
	Partially Furnished	-	1125	-	-	-	650	-	1000	-	-
	Unfurnished	-	-	-	-	-	-	-	-	-	-
Negeri Sembilan	Fully Furnished	1983	1872	-	-	-	-	1041	1646	1450	-
	Partially Furnished	2067	1472	-	-	1100	-	-	1202	-	-
	Unfurnished	1700	1239	1800	-	-	450	850	1300	-	-
Pahang	Fully Furnished	4000	5000	-	-	-	-	-	-	2100	-
	Partially Furnished	-	-	-	-	-	-	-	-	-	-
	Unfurnished	-	1000	-	-	-	-	-	-	-	-
Perak	Fully Furnished	-	1760	-	-	-	-	1450	1850	-	-

State	Furniture Type	Property Type									
		Sewa Rumah Berkembar	Sewa Rumah Teres	Sewa Rumah Berangkai	Sewa Rumah Berkelompok	Sewa Rumah Bandar	Sewa Rumah Pangsa	Sewa Rumah Pangsapuri	Sewa Rumah Kondominium	Sewa Rumah Pangsapuri Khidmat	Sewa Rumah SOHO/SOFO/SOVO
	Partially Furnished	750	-	-	-	2200	-	1250	900	-	-
	Unfurnished	-	1050	-	-	-	-	-	850	-	-
Perlis	Fully Furnished	-	-	-	-	-	-	-	-	-	-
	Partially Furnished	-	-	-	-	-	-	-	-	-	-
	Unfurnished	-	-	-	-	-	-	-	-	-	-
Pulau Pinang	Fully Furnished	2850	2843	-	-	2300	975	1354	2400	1574	1000
	Partially Furnished	-	1320	-	-	2100	961	1122	1468	1325	-
	Unfurnished	3500	1517	-	-	-	767	721	1074	-	-
Sabah	Fully Furnished	-	-	-	-	2800	-	-	2089	-	-
	Partially Furnished	-	2750	-	-	-	-	-	1200	-	-
	Unfurnished	-	-	-	-	-	-	-	-	-	-
Sarawak	Fully Furnished	1480	-	-	-	-	-	2900	-	2000	-
	Partially Furnished	-	-	-	-	-	-	1700	-	-	-
	Unfurnished	-	-	-	-	-	-	-	-	-	-
Selangor	Fully Furnished	3614	2991	-	-	3271	1090	2083	2228	2488	1453
	Partially Furnished	3300	1945	2200	2000	1575	821	1258	1617	1912	1250
	Unfurnished	3040	1788	-	-	1500	838	1009	1299	1600	1100
Terengganu	Fully Furnished	-	-	-	-	-	-	-	-	-	-
	Partially Furnished	-	-	-	-	-	-	-	-	-	-
	Unfurnished	-	-	-	-	-	-	-	-	-	-

State	Furniture Type	Property Type									
		Sewa Rumah Berkembar	Sewa Rumah Teres	Sewa Rumah Berangkai	Sewa Rumah Berkelompok	Sewa Rumah Bandar	Sewa Rumah Pangsa	Sewa Rumah Pangsapuri	Sewa Rumah Kondominium	Sewa Rumah Pangsapuri Khidmat	Sewa Rumah SOHO/SOFO/SOVO
W.P. Kuala Lumpur	Fully Furnished	4000	2933	-	-	-	1000	2152	2901	2986	1900
	Partially Furnished	4010	2724	-	-	-	1033	1727	2261	2249	3050
	Unfurnished	-	2032	-	-	-	1011	1218	1624	2000	-
W.P. Labuan	Fully Furnished	-	-	-	-	-	-	-	-	-	-
	Partially Furnished	-	-	-	-	-	-	-	-	-	-
	Unfurnished	-	-	-	-	-	-	-	-	-	-
W.P. Putrajaya	Fully Furnished	-	-	-	-	-	-	1800	2391	1899	-
	Partially Furnished	5000	-	-	-	-	-	1700	2133	-	-
	Unfurnished	-	-	-	-	-	-	1325	1350	-	-

Table 7: Summary of Average Rent Price by Posted Date recorded between 1 June 2024 to 31 October 2024

Property Type	Posted Date				
	June	July	August	September	October
Sewa Rumah Berkembar	2528	3423	3439	2274	2667
Sewa Rumah Teres	1944	1997	2015	1762	1717
Sewa Rumah Berangkai	1800	5000	3300	-	2200
Sewa Rumah Berkelompok	3000	2567	2500	2000	4700
Sewa Rumah Bandar	2047	1777	2700	1696	2250
Sewa Rumah Pangsa	982	1042	842	885	705
Sewa Rumah Pangsapuri	1380	1829	1849	1567	1416
Sewa Rumah Kondominium	2079	2715	2724	1936	1970
Sewa Rumah Pangsapuri Khidmat	2539	2662	2810	3024	2183
Sewa Rumah SOHO/SOFO/SOVO	1540	3950	1100	1466	1800

8.2 Script for Finding Longitude Latitude

```
import knime.scripting.io as knio
import pandas as pd
import requests

# Load the KNIME input table as a pandas DataFrame
df = knio.input_tables[0].to_pandas()

# Check if the 'Addresses' column exists
if 'Addresses' not in df.columns:
    print("Error: 'Addresses' column not found in the dataset.")
else:
    print("Addresses' column found.")

# Replace with your actual Mapbox token
MAPBOX_ACCESS_TOKEN = "USE YOUR OWN ACCESS TOKEN"

# Function to get latitude and longitude from an Addresses using Mapbox
def get_lat_lng(Addresses):
    try:
        if pd.isna(Addresses): # Check if the Addresses is NaN
            return None, None

        # Make a request to the Mapbox API
        response = requests.get(
            f"https://api.mapbox.com/geocoding/v5/mapbox.places/{Addresses}.json?access_token={MAPBOX_ACCESS_TOKEN}"
        )
        data = response.json()

        if 'features' in data and len(data['features']) > 0:
            lat = data['features'][0]['center'][1] # Latitude
            lng = data['features'][0]['center'][0] # Longitude
            return lat, lng
        else:
            return None, None
    except Exception as e:
        print(f"Error fetching lat/lng for Addresses {Addresses}: {e}")
        return None, None

# Ensure the Latitude and Longitude columns exist
df['Latitude'] = None
```

```

df['Longitude'] = None

# Apply the geocoding function to the 'Addresses' column
if 'Addresses' in df.columns:
    try:
        for idx, row in df.iterrows():
            lat, lng = get_lat_lng(row['Addresses'])
            df.at[idx, 'Latitude'] = lat
            df.at[idx, 'Longitude'] = lng
            print("Geocoding completed successfully.")
    except Exception as e:
        print(f"Error during geocoding: {e}")

# Output the DataFrame as a KNIME table
knio.output_tables[0] = knio.Table.from_pandas(df)
print("Geocoding results saved to output table.")

```

8.3 Script for Finding State and District Using Shapefile

```

import pandas as pd
import geopandas as gpd
from shapely.geometry import Point
import knime.scripting.io as knio

# Ensure input tables are not None
if knio.input_tables[1] is None:
    raise ValueError("CSV input table is missing.")
if knio.input_tables[0] is None:
    raise ValueError("Shapefile input table is missing.")

# Load the input tables from KNIME (CSV and shapefile data)
df = knio.input_tables[1].to_pandas() # This is your CSV data
shapefile_df = knio.input_tables[0].to_pandas() # This is your shapefile data

# Debug: Print columns to ensure correct data
print("CSV columns:", df.columns)
print("Shapefile columns:", shapefile_df.columns)

# Convert 'Latitude' and 'Longitude' to numeric, coercing errors to NaN
df['Latitude'] = pd.to_numeric(df['Latitude'], errors='coerce')
df['Longitude'] = pd.to_numeric(df['Longitude'], errors='coerce')

```

```

# Drop rows where Latitude or Longitude is NaN
df_clean = df.dropna(subset=['Latitude', 'Longitude'])

# Check if 'Latitude' and 'Longitude' columns exist in the cleaned CSV
if 'Latitude' not in df_clean.columns or 'Longitude' not in df_clean.columns:
    raise KeyError("Columns 'Latitude' and 'Longitude' are required in the CSV input.")

# Convert the cleaned CSV DataFrame to a GeoDataFrame
geometry = [Point(xy) for xy in zip(df_clean['Longitude'], df_clean['Latitude'])]
geo_df = gpd.GeoDataFrame(df_clean, geometry=geometry)
geo_df.crs = 'EPSG:4326' # Set the coordinate reference system (CRS)

# Convert the shapefile DataFrame to a GeoDataFrame (assuming it already has
# geometry)
gdf = gpd.GeoDataFrame(shapefile_df, geometry=shapefile_df['geometry'])
gdf.crs = 'EPSG:4326' # Set CRS for the shapefile data as well

# Perform a spatial join between the CSV GeoDataFrame and the shapefile
# GeoDataFrame
merged_gdf = gpd.sjoin(geo_df, gdf, how="left", predicate='intersects')

# Identify columns from shapefile and CSV to include in the final output
shapefile_columns = [col for col in gdf.columns if col not in ['geometry']]
csv_columns = [col for col in df_clean.columns if col not in ['Latitude', 'Longitude']]

# Drop unwanted columns from the spatial join result
merged_df = merged_gdf.drop(columns=['geometry', 'index_right'])

# Reorder columns: Latitude, Longitude, shapefile_columns, csv_columns
ordered_columns = ['Latitude', 'Longitude'] + shapefile_columns + csv_columns
merged_df = merged_df[ordered_columns]

# Set the merged result as the output table for KNIME
knio.output_tables[1] = knio.Table.from_pandas(merged_df) # Output merged
# DataFrame (CSV-like)

# Convert the merged DataFrame back to a GeoDataFrame
geometry_merged = [Point(xy) for xy in zip(merged_df['Longitude'],
                                             merged_df['Latitude'])]
geo_df_merged = gpd.GeoDataFrame(merged_df, geometry=geometry_merged)
geo_df_merged.crs = 'EPSG:4326' # Ensure the CRS is set

# Set the GeoDataFrame as the output for KNIME (shapefile-like)
knio.output_tables[0] =
knio.Table.from_pandas(geo_df_merged.drop(columns=['geometry']))

```

8.4 Python Script for Scraping Mudah Website

```
import cloudscraper
import pandas as pd
from bs4 import BeautifulSoup
import json
from tqdm import tqdm
import re
import random
import time
from typing import List, Dict, Tuple, Optional
from geopy.geocoders import Nominatim
from geopy.exc import GeocoderTimedOut, GeocoderServiceError
from datetime import datetime, timedelta

# Constants
BASE_URL = 'https://www.mudah.my'
SCRAPER = cloudscraper.create_scraper(
    browser={
        'browser': 'firefox',
        'platform': 'windows',
        'mobile': False
    },
    delay=10
)
PROPERTY_ATTRIBUTES = {
    'address',
    'category_id',
    'monthly_rent',
    'property_type',
    'state',
    'region',
    'rooms',
    'bathroom',
    'size',
    'furnished',
    'facilities',
    'additional_facilities',
    'latitude',
    'longitude',
    'publishedDatetime',
    'ads_id',
    # 'adviewUrl'
}
```

```

def generate_page_urls(state: str, start: int, end: int) -> List[str]:
    """Generate a list of URLs for the given state and page range."""
    base_url = f'{BASE_URL}/{state}/properties-for-rent?o=' if state else
    f'{BASE_URL}/malaysia/properties-for-rent?o='
    return [f'{base_url}{i}' for i in range(start, end + 1)]

def collect_property_links(url: str, min_delay: float = 3, max_delay: float = 7) ->
List[str]:
    """
    Collect property links from a given page URL with randomized delays.

    Args:
        url (str): The URL to scrape
        min_delay (float): Minimum delay in seconds (default: 3)
        max_delay (float): Maximum delay in seconds (default: 7)

    Returns:
        List[str]: List of collected property URLs
    """
    try:
        # Random delay before making the request
        delay = random.uniform(min_delay, max_delay)
        time.sleep(delay)

        response = SCRAPER.get(url)
        response.raise_for_status()
        soup = BeautifulSoup(response.text, "html.parser")
        script = soup.find('script', type='application/ld+json')
        all_links = []

        if script:
            data = json.loads(script.text)
            item_list = data[2].get('itemListElement', [])
            all_links = [item['item']['url'] for item in item_list]

        return all_links

    except json.JSONDecodeError as e:
        print(f"JSON parsing error for {url}: {str(e)}")
        return []
    except Exception as e:
        print(f"Error collecting links from {url}: {str(e)}")
        return []

def get_property_links(state: str, start_page: int, end_page: int) -> List[str]:
    """Get all property links for the given state and page range."""

```

```

page_urls = generate_page_urls(state, start_page, end_page)
prop_link_list = []
for page_url in tqdm(page_urls, desc="Collecting property links"):
    prop_link_list.extend(collect_property_links(page_url))
return prop_link_list

def extract_property_details(url: str, prop_id_no: str, details: Dict) -> List[Dict]:
    """Extract property details from the JSON data."""
    prop_attr = details.get('attributes', {}).get('propertyParams', [])
    category_attr = details.get('attributes', {}).get('categoryParams', [])
    building_details = prop_attr[2]['params'] if len(prop_attr) > 2 else []

    # Extract additional details
    attributes = details.get('attributes', {})
    other_attr = [
        {'id': 'name', 'value': attributes.get("name", "")},
        {'id': 'phone', 'value': attributes.get("phone", "")},
        {'id': 'body', 'value': attributes.get("body", "")},
        {'id': 'state', 'value': attributes.get("regionName", "")},
        {'id': 'region', 'value': attributes.get("subregionName", "")},
        {'id': 'advviewUrl', 'value': attributes.get("advviewUrl", "")},
        {'id': 'publishedDatetime', 'value':
            parse_datetime(attributes.get("publishedDatetime", ""))},
        {'id': 'scrape_date', 'value': datetime.now().strftime("%Y-%m-%d")},
        {'id': 'ads_id', 'value': prop_id_no}
    ]
    return category_attr + building_details + other_attr

def scrape_property_details(state: str, start_page: int, end_page: int, sleep_time: int) -> pd.DataFrame:
    """Scrape property details for the given state and page range."""
    property_data = []
    links = get_property_links(state, start_page, end_page)

    for url in tqdm(links, desc="Scraping..."):
        try:
            page = SCRAPER.get(url)
            page.raise_for_status()
            soup = BeautifulSoup(page.text, 'html.parser')
            script = soup.find('script', id='__NEXT_DATA__') or soup.find('script', type='application/json')

            if not script:
                print(f"Script not found for URL: {url}")
                continue

```

```

data = json.loads(script.text)
prop_id_no = re.search(r'-(\d+)\.htm', url).group(1)
details = data.get('props', {}).get('initialState', {}).get('adDetails', {}).get('byID', {})
details.get(prop_id_no, {})

prop_unit = extract_property_details(url, prop_id_no, details)

# Check if the category_id is not 'Commercial Property, For rent' or 'Land, For
rent'
category_id = next((item['value'] for item in prop_unit if item['id'] ==
'category_id'), None)
if category_id not in ['Commercial Property, For rent', 'Land, For rent', 'Room,
For rent']:
    address = next((item['value'] for item in prop_unit if item['id'] == 'address'),
None)
    lat, lon = get_lat_lon(address) if address else (None, None)
    prop_unit.extend([
        {'id': 'latitude', 'value': lat},
        {'id': 'longitude', 'value': lon}
    ])
    property_data.append({item['id']: item['value'] for item in prop_unit if item['id'] in PROPERTY_ATTRIBUTES})
else:
    print(f"Skipping {category_id}")

except Exception as e:
    print(f"An error occurred for {url}, error: {e}")

time.sleep(sleep_time)

return pd.DataFrame(property_data)

# Keep the get_lat_lon, parse_datetime, extract_property_details, and main functions
unchanged

def get_lat_lon(address: str) -> Tuple[Optional[float], Optional[float]]:
    """Get latitude and longitude for a given address."""
    geolocator = Nominatim(user_agent="my_agent")
    try:
        location = geolocator.geocode(address)
        return (location.latitude, location.longitude) if location else (None, None)
    except (GeocoderTimedOut, GeocoderServiceError):
        time.sleep(2) # Wait for 2 seconds before retrying
    return get_lat_lon(address)

```

```

def parse_datetime(datetime_str: str) -> str:
    """Parse datetime string and return a standardized format."""
    if "Yesterday" in datetime_str:
        date = datetime.now() - timedelta(days=1)
    elif "Today" in datetime_str:
        date = datetime.now()
    else:
        return datetime_str # Assuming it's already in the correct format

    time_part = datetime_str.split(" ")[1]
    return f'{date.strftime("%Y-%m-%d")} {time_part}'


def main():
    state = input("Enter the state you want to scrape: ")
    start_page = int(input("Enter the starting page number: "))
    end_page = int(input("Enter the ending page number: "))
    sleep_time = int(input("Enter the sleep time between requests (in seconds):"))

    df = scrape_property_details(state, start_page, end_page, sleep_time)

    date = datetime.now().strftime("%Y%m%d%H%M%S")
    filename = f'D:/3. Data Analysis Project/Mudah Website/Mudah Rental Properties/Scraped Data/Scraped_Data_Page{start_page}to{end_page}({date})({state}).csv'
    df.to_csv(filename, index=False)
    print(f"Data has been successfully scraped and saved to {filename}")

if __name__ == "__main__":
    main()

```

8.5 Power Automate Workflow for Scraping Landprop Website

Main Extracting link's listing Collecting Webpage Extracting data from W...

Get current date and time
Retrieve the current datetime and store it into `CurrentDateFolder`

Convert datetime to text
Convert datetime `CurrentDateFolder` to text using format 'M' and store it into `CurrentDateFolderRename`

Launch new Chrome
Launch Chrome, navigate to '<https://www.land.plus/malaysia/listings/residential/for-rent?s=true>' and store the instance into `Browser`

Extract data from web page
Extract single value from web page and store it in `input_page`

If `input_page` Is not empty then

- Run JavaScript function on web page**
Run JavaScript function `'function ExecuteScript() {`
JS
`var elementText = document.getElementsByClassName('paging')[0].innerText;`
`return elementText;`
- Run JavaScript function on web page**
Run JavaScript function `'function ExecuteScript() {`
JS
`window.scrollTo(0,document.body.scrollHeight);`
- }' and store the response into `Scroll_Down`**
- Set variable**
(x) Assign to variable `NewVar` the value `Result`

Main Extracting link's listing Collecting Webpage Extracting data from W...

Loop condition While (`NewVar`) =('loading more listings ...')

- Run JavaScript function on web page**
Run JavaScript function `'function ExecuteScript() {`
JS
`window.scrollTo(0,document.body.scrollHeight);`
- }' and store the response into `Scroll_Down`**
- Run JavaScript function on web page**
Run JavaScript function `'function ExecuteScript() {`
JS
`var elementText = document.getElementsByClassName('paging')[0].innerText;`
`return elementText;`
- Set variable**
(x) Assign to variable `NewVar` the value `Result`

End

Extract data from web page
Extract list from web pages and store it in `Link_Listings`

Else

Extract data from web page
Extract list from web pages and store it in `Link_Listings`

End

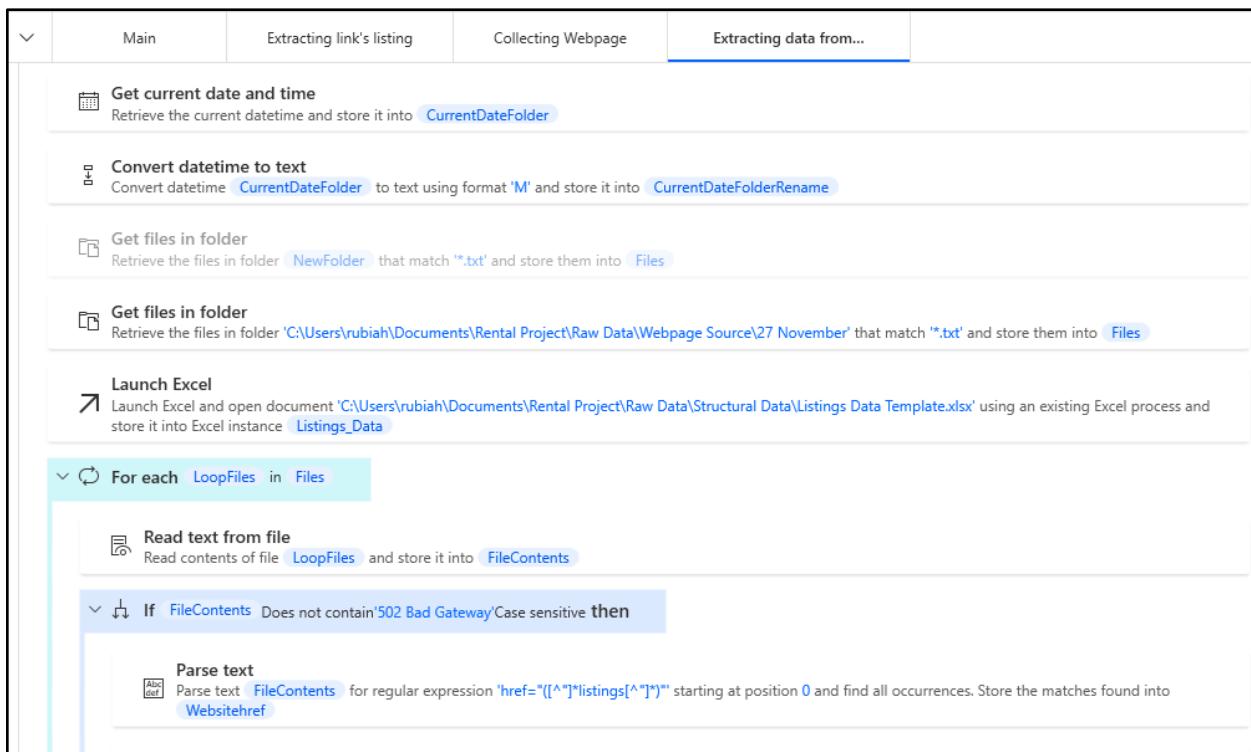
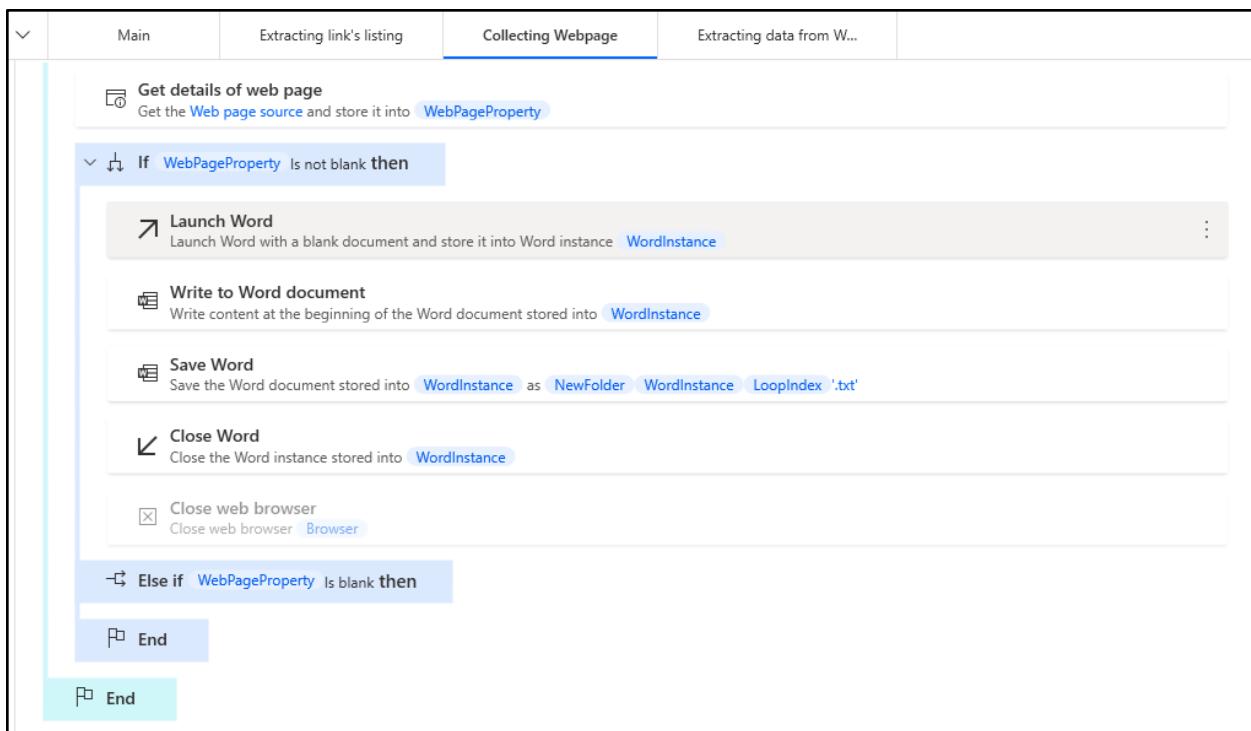
>Main	Extracting link's listing	Collecting Webpage	Extracting data from W...
-------	---------------------------	--------------------	---------------------------

Else :

- Extract data from web page**
Extract list from web pages and store it in `Link_Listings`
- End**
- Launch Excel**
Launch Excel and open document '`C:\Users\rubiah\Documents\Landprop Listings link - 2 Sept.xlsx`' using an existing Excel process and store it into Excel instance `Link_Excel`
- Get first free column/row from Excel worksheet**
Get the first free column/row in the active worksheet of the Excel document whose instance is stored into `Link_Excel` and store them into `FirstFreeColumn` and `FirstFreeRow`
- Write to Excel worksheet**
Write the value `Link_Listings` into cell in column 'A' and row `FirstFreeRow` of the Excel instance `Link_Excel`
- Save Excel**
Save the Excel document stored into `Link_Excel` as '`C:\Users\rubiah\Documents\Landprop Listings link - ' + CurrentDateFolderRename + '.xlsx`'
- Close Excel**
Save the Excel document and close the Excel instance `Link_Excel`
- Close web browser**
Close web browser `Browser`

>Main	Extracting link's listing	Collecting Webpage	Extracting data from W...
-------	---------------------------	--------------------	---------------------------

- Get current date and time**
Retrieve the current datetime and store it into `CurrentDateFolder`
- Convert datetime to text**
Convert datetime `CurrentDateFolder` to text using format 'M' and store it into `CurrentDateFolderRename`
- Launch new Chrome**
Launch Chrome, navigate to '`https://www.land.plus/malaysia/listings/apartments/for-rent`' and store the instance into `Browser`
- Create folder**
Create folder `CurrentDateFolderRename` into '`C:\Users\rubiah\Documents\Rental Project\Raw Data\Webpage Source`'
- Read from Excel worksheet**
Read the values of all cells in worksheet and store it into `ExcelData`
- Close Excel**
Close the Excel instance stored into `Link_Excel`
- Loop `LoopIndex` from 0 to 20000 with step 1**
 - Set variable**
Assign to variable `Link` the value `ExcelData [LoopIndex]`
 - Go to web page**
Navigate to `Link`
 - Get details of web page**
Get the `WebPageDetails` and store it into `WebPageDetails`



>Main	Extracting link's listing	Collecting Webpage	Extracting data from...
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Parse text
Parse text **FileContents** for regular expression '`href="[^"]*listings[^"]*">[^<]+`' starting at position 0 and find all occurrences. Store the matches found into **Breadcrumbs**

Parse text
Parse text **FileContents** for regular expression '`<div>[^<]+</div><div>(?)?(^<+)(?)?`' starting at position 0 and find all occurrences. Store the matches found into **Matches**

Parse text
Parse text **FileContents** for regular expression '`href="[^"]*">Learn more`' starting at position 0 and find all occurrences. Store the matches found into **HrefLocation**

Crop text
Get text between the specified flags `""` and `""` from text **HrefLocation** and store it into **LearnmorePage**

↙ ↘ If **Websitehref** Is empty then

{x} Set variable
Assign to variable **LinkWebsite** the value 'none'

↙ ↗ Else

Crop text
Get text between the specified flags `""` and `""` from text **Websitehref [0]** and store it into **LinkWebsite**

⚐ End

>Main	Extracting link's listing	Collecting Webpage	Extracting data from...
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⚐ End

Crop text
Get text between the specified flags '`<div>Monthly Rental</div><div>`' and '`</div>`' from text **FileContents** and store it into **RentPrice**

Crop text
Get text between the specified flags '`<div>Property Type</div><div>`' and '`</div>`' from text **FileContents** and store it into **.PropertyType**

Crop text
Get text between the specified flags '`<div>Built-up</div><div>`' and '`</div>`' from text **FileContents** and store it into **BuiltUp**

Crop text
Get text between the specified flags '`<div>Bedrooms</div><div>`' and '`</div>`' from text **FileContents** and store it into **Bedrooms**

Crop text
Get text between the specified flags '`<div>Bathrooms</div><div>`' and '`</div>`' from text **FileContents** and store it into **Bathrooms**

Crop text
Get text between the specified flags '`<div>Furnishing</div><div>`' and '`</div>`' from text **FileContents** and store it into **Furnishing**

Crop text
Get text between the specified flags '`<div>Posted On</div><div>`' and '`</div>`' from text **FileContents** and store it into **PostedDate**

Parse text
Parse text **FileContents** for regular expression '`href[^\>]+<a></div></div>`' starting at position 0 and find all occurrences. Store the matches found into **AgentText**

↙ ↘ If **AgentText** Is empty then

>Main	Extracting link's listing	Collecting Webpage	Extracting data from...
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    < If AgentText Is empty then
      {x} Set variable
      Assign to variable AgentName the value 'None'
    < Else
      [ABC] Crop text
      Get text between the specified flags '>' and '<' from text AgentText [0] and store it into AgentName
    End
    [ABC] Get first free column/row from Excel worksheet
    Get the first free row in the active worksheet of the Excel document whose instance is stored into Listings_Data and store it into FirstFreeRow
    {x} Set variable
    Assign to variable Index the value FirstFreeRow
    [ABC] Write to Excel worksheet
    Write the value RentPrice into cell in column 'A' and row Index of the Excel instance Listings_Data
    [ABC] Write to Excel worksheet
    Write the value PropertyType into cell in column 'B' and row Index of the Excel instance Listings_Data
    [ABC] Write to Excel worksheet
    Write the value BuiltUp into cell in column 'C' and row Index of the Excel instance Listings_Data
  
```

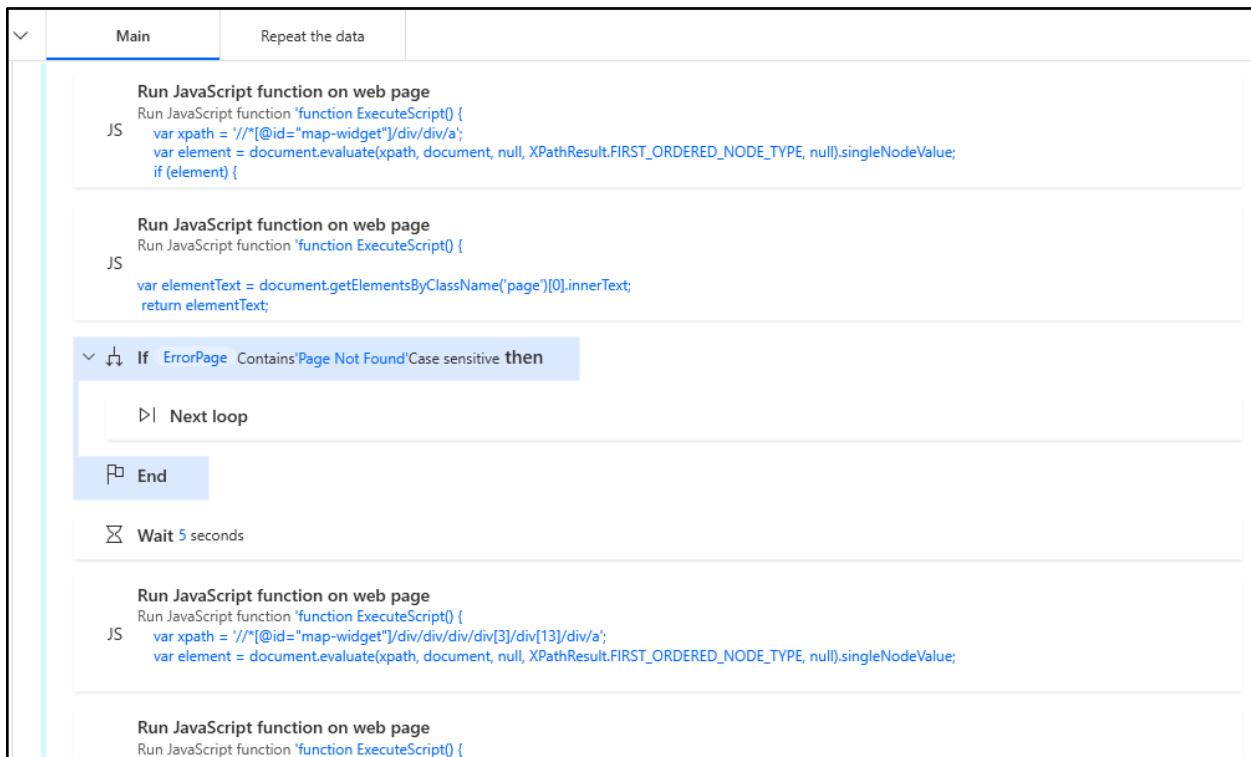
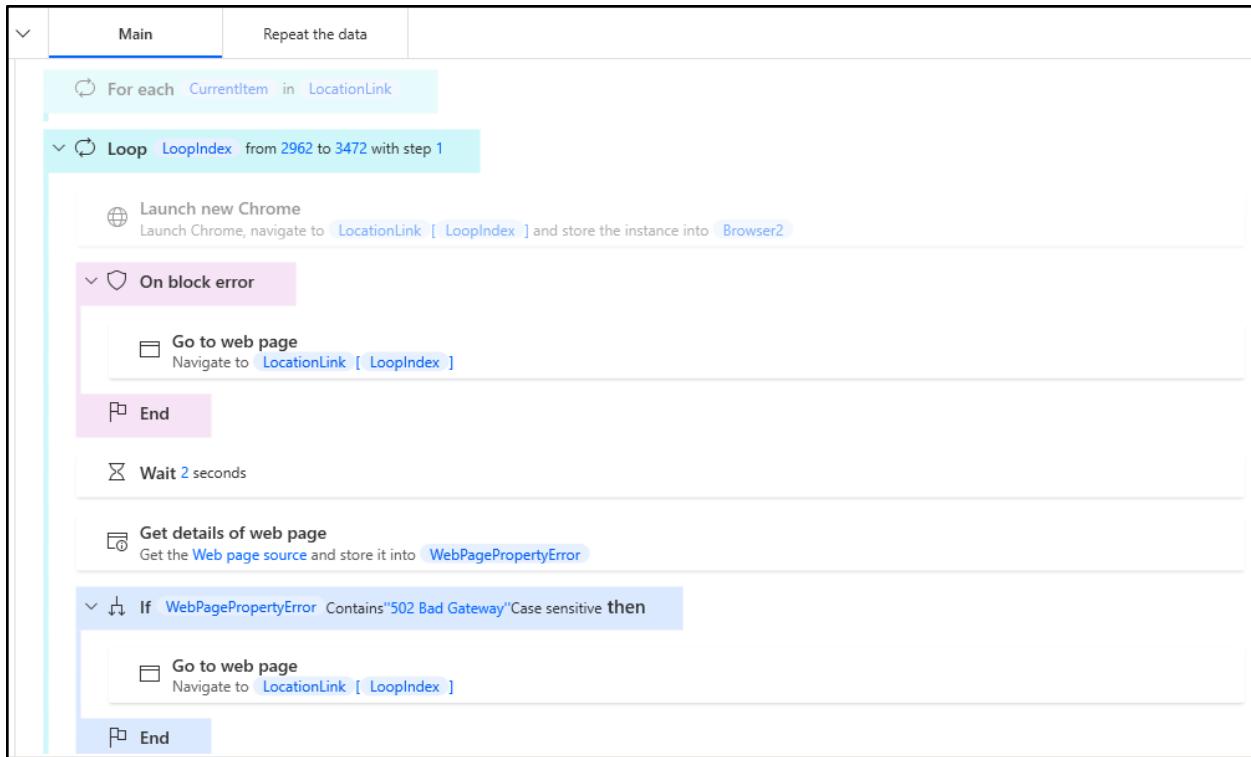
>Main	Extracting link's listing	Collecting Webpage	Extracting data from...
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    {x} Set variable
    Assign to variable Index the value FirstFreeRow
    [ABC] Write to Excel worksheet
    Write the value RentPrice into cell in column 'A' and row Index of the Excel instance Listings_Data
    [ABC] Write to Excel worksheet
    Write the value PropertyType into cell in column 'B' and row Index of the Excel instance Listings_Data
    [ABC] Write to Excel worksheet
    Write the value BuiltUp into cell in column 'C' and row Index of the Excel instance Listings_Data
    [ABC] Write to Excel worksheet
    Write the value Bedrooms into cell in column 'D' and row Index of the Excel instance Listings_Data
    [ABC] Write to Excel worksheet
    Write the value Bathrooms into cell in column 'E' and row Index of the Excel instance Listings_Data
    [ABC] Write to Excel worksheet
    Write the value Furnishing into cell in column 'F' and row Index of the Excel instance Listings_Data
    [ABC] Write to Excel worksheet
    Write the value AgentName into cell in column 'G' and row Index of the Excel instance Listings_Data
    [ABC] Write to Excel worksheet
    Write the value PostedDate into cell in column 'H' and row Index of the Excel instance Listings_Data
    [ABC] Write to Excel worksheet
  
```

	Main	Extracting link's listing	Collecting Webpage	Extracting data from...
		<p>Write to Excel worksheet Write the value <code>AgentName</code> into cell in column 'G' and row <code>Index</code> of the Excel instance <code>Listings_Data</code></p> <p>Write to Excel worksheet Write the value <code>PostedDate</code> into cell in column 'H' and row <code>Index</code> of the Excel instance <code>Listings_Data</code></p> <p>Write to Excel worksheet Write the value <code>LinkWebsite</code> into cell in column 'I' and row <code>Index</code> of the Excel instance <code>Listings_Data</code></p> <p>Write to Excel worksheet Write the value <code>CurrentDateFolder</code> into cell in column 'J' and row <code>Index</code> of the Excel instance <code>Listings_Data</code></p> <p>Set variable Assign to variable <code>LinkPlace</code> the value 'https://www.land.plus' <code>LearnmorePage</code></p> <p>Write to Excel worksheet Write the value <code>LinkPlace</code> into cell in column 'K' and row <code>Index</code> of the Excel instance <code>Listings_Data</code></p> <p>End</p> <p>End</p> <p>Close Excel Save the Excel document as '<code>C:\Users\rubiah\Documents\Rental Project\Raw Data\Structural Data\Listings Data - ' + <code>CurrentDateFolderRename</code> '.xlsx'</code> and close the Excel instance <code>Listings_Data</code></p>		

	Main	Repeat the data
	<p>Get current date and time Retrieve the current datetime and store it into <code>CurrentDateTime</code></p> <p>Convert datetime to text Convert datetime <code>CurrentDateTime</code> to text using format 'dd MMM' and store it into <code>FormattedDateTime</code></p> <p>Launch Excel Launch Excel and open document '<code>C:\Users\rubiah\Documents\Rental Project\Raw Data\Structural Data\Listings Data - 2 Sept.xlsx</code>' using an existing Excel process and store it into Excel instance <code>ExcelInstance</code></p> <p>Set active Excel worksheet Activate the worksheet 'Table2' of the Excel instance <code>ExcelInstance</code></p> <p>Get first free column/row from Excel worksheet Get the first free column/row in the active worksheet of the Excel document whose instance is stored into <code>ExcelInstance</code> and store them into <code>FirstFreeColumn</code> and <code>FirstFreeRow2</code></p> <p>Read from Excel worksheet Read the values of the cells ranging from column 1 row 2 to column <code>FirstFreeColumn</code> - 1 row <code>FirstFreeRow2</code> - 1 and store it into <code>LocationLink</code></p> <p>Close Excel Close the Excel instance stored into <code>ExcelInstance</code></p> <p>Launch Excel Launch Excel and open document '<code>C:\Users\rubiah\Documents\Rental Project\Raw Data\Structural Data\Location - 01 Oct.xlsx</code>' using an existing Excel process and store it into Excel instance <code>Listings_Data</code></p> <p>Launch new Chrome Launch Chrome navigate to 'https://www.land.plus/malaysia/listings/for-rent' and store the instance into <code>Browser2</code></p>	



Main Repeat the data

Crop text
Get text between the specified flags ';' and '&' from text `elementLink` and store it into `longitude`

Parse text
Parse text `WebPageProperty2` for regular expression '`<ul class="breadcrumb">([\s\S]+?)`' starting at position `0` and find all occurrences. Store the matches found into `Breadcrumbs`

Parse text
Parse text `Breadcrumbs` for regular expression '`([\s\S]+?)`' starting at position `0` and find all occurrences. Store the matches found into `BreadcrumbsLast`

Crop text
Get text between the specified flags '`<li class="active">`' and '`<`' from text `Breadcrumbs` and store it into `StateLast`

{x} Set variable
Assign to variable `CountIndex` the value `0`

For each CurrentItem in BreadcrumbsLast

- Increase variable**
Increase variable `CountIndex` by `1`
- End**

If CountIndex = 2 then

- Set variable**

Crop text
Get text after the specified flag '`>`' from text `State2` and store it into `Location_Daerah`

Get first free column/row from Excel worksheet
Get the first free row in the active worksheet of the Excel document whose instance is stored into `Listings_Data` and store it into `FirstFreeRow`

{x} Set variable
Assign to variable `Index` the value `FirstFreeRow`

Write to Excel worksheet
Write the value `CurrentItem` into cell in column 'A' and row `Index` of the Excel instance `Listings_Data`

Write to Excel worksheet
Write the value `LocationLink [LoopIndex]` into cell in column 'A' and row `Index` of the Excel instance `Listings_Data`

Write to Excel worksheet
Write the value `elementLink` into cell in column 'B' and row `Index` of the Excel instance `Listings_Data`

Write to Excel worksheet
Write the value `longitude` into cell in column 'C' and row `Index` of the Excel instance `Listings_Data`

Write to Excel worksheet
Write the value `latitude` into cell in column 'D' and row `Index` of the Excel instance `Listings_Data`

Write to Excel worksheet
Write the value `Location_Negeri` into cell in column 'E' and row `Index` of the Excel instance `Listings_Data`

Write to Excel worksheet