# Airbnb Data Analysis Software User Manual

## 1. Introduction:

The Airbnb Data Analysis Software is designed to assist renters, lessors, and property managers in analyzing property prices. This tool helps users delve deep into the real estate market, making informed decisions when choosing locations, understanding pricing, area information, and more.

## 2. System Requirements:

There isn't a standalone release version of the software. Users are required to set up a Python environment.

## 3. Environment Setup:

* **Downloading the Source Code**:
  + Clone the repository from GitHub:
  + **Git clone https://github.com/wsq94317/SoftwareTechnologyGroup47.git**
* **Setting up in a Python IDE (such as PyCharm, Conda)**:
  + Navigate to the 'SoftwareTechnologyGroup47' directory.
* **Installing Python Libraries**:
  + **pip install pandas** // For the Panda library.
  + **pip install matplotlib** // For the Matplotlib library.
  + **pip install wxPython** // For the wxPython GUI library.
* **Dataset Download**:
  + Get the dataset from [Kaggle](https://www.kaggle.com/tylerx/sydney-airbnb-open-data).
  + After downloading, copy the files 'calendar\_dec18.csv', 'listings\_dec18.csv', and 'reviews\_dec18.csv' into the '/SoftwareTechnologyGroup47/datasets' directory.

## 4. User Guide:

The software boasts five distinct functionalities:

### Location-specific Price Data Query:

* + From the homepage, navigate to the search page by clicking the appropriate button.
  + Select desired locations and enter the starting date (year, month, day) followed by the total duration of time.
  + Press 'Confirm' to generate the location-specific Airbnb data table.

### Overall Price Distribution Histogram:

* + Navigate to the search page from the homepage.
  + Select your regions of interest and provide the time range.
  + Clicking 'Confirm' will yield a histogram detailing property prices for enhanced visualization.

### Keyword Search Query:

* + Transition to the search page from the main interface.
  + Designate regions for inquiry, input the starting date, and specify the desired timeframe.
  + Enter your keyword(s) of interest. Pressing 'Confirm' will generate property records relevant to your keywords.

### Cleanliness Review Report:

* + Directly from the homepage, you can access a comprehensive list of user comments related to cleanliness.

### Regional Price Fluctuation Line Graph:

* + Mark your desired regions, state the starting point in time, and indicate the length of the period in question.
  + Click 'Confirm' to view a line graph showcasing price fluctuations in the selected areas.

## Data Analysis：

### 1. Trend Analysis:

* **Seasonal Price Fluctuations: Analyze the variations in property prices over different seasons. Identify peak seasons for property rentals and determine the best times for renters to find deals or for lessors to optimize pricing.**
* **Growth over Years: Track the growth of property listings and rentals over the years. This can provide insights into the growing popularity of certain regions or the overall growth of Airbnb rentals.**

## 2. Location Analysis:

* **Popular Destinations: Identify areas that have the highest number of listings or receive the most reviews, indicating their popularity.**
* **Costliest vs. Most Economical Regions: Determine which locations have the highest and lowest average rental prices. This can help in budgeting trips or deciding on rental investments.**

## 3. Review Analysis:

* **Sentiment Analysis: Use the comments/reviews data to perform sentiment analysis. Understand the general sentiment of renters towards certain listings or areas.**
* **Keyword Analysis: Beyond cleanliness, identify other commonly mentioned aspects in reviews like 'security', 'amenities', 'proximity to transport', etc.**

## 4. Amenities Analysis:

* **Most Sought-After Amenities: Determine which amenities in listings are most preferred or mentioned by renters. This can guide property managers in upgrading or marketing their properties.**

## 5. Occupancy Rates:

* **High vs. Low Occupancy: Track which properties or areas have the highest occupancy rates. High occupancy could indicate a popular area or a listing that offers good value for money.**

## 6. Comparative Analysis:

* **Listings vs. Reviews: Compare the number of listings in an area to the number of reviews received. A high ratio of reviews to listings could indicate a more satisfying renter experience or a highly active rental property.**

## 7. Economic Impact:

* **Earnings over Time: Based on property prices and occupancy rates, calculate potential earnings for lessors over time. Understand the economic impact of Airbnb in specific areas or overall.**

## 8. Predictive Analysis:

* **Future Price Prediction: Using historical data, predict future price trends for specific regions or types of listings.**
* **Demand Forecasting: Predict the future demand for rentals in specific areas. This can help lessors or property managers in planning and pricing.**

## 9. Demographic Analysis:

* **Renter Profiles: If demographic data is available, analyze the typical profile of renters. Understand which age groups or demographics prefer which types of listings or areas.**

## 10. Competitive Analysis:

* **Superhosts vs. Regular Hosts: Analyze if properties managed by Superhosts tend to have higher occupancy rates, better reviews, or higher prices compared to regular hosts.**

## Troubleshooting:

If, during the line graph generation, only a blank image appears or if the graph seems incomplete, it may be due to data missing from the dataset.

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