

MEMBERS & ROLES

Team Member

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 Leslie Buckholtz
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Role

Analytical Lead
 PM & Conceptual Design Lead
 Technical Lead

PROBLEM

We plan to analyze factors influencing Airbnb listing prices, super host status, and availability, and to identify high-performing neighborhoods for potential investment. Additionally, customer review sentiment will be examined to assess its impact on listing success.

Our approach includes the following steps:

- Predict Airbnb listing prices using property, host, and neighborhood features.
- Identify clusters of neighborhoods based on rental performance and availability.
- Visualize geographic trends in Airbnb pricing and listing density.
- Analyze sentiment in guest reviews and correlate it with pricing and availability.
- Identify factors that contribute to super host status.

OBJECTIVES

- Enhance the reader's understanding of the dynamics within the short-term Airbnb rental market.
- Assist the reader in making informed decisions to maximize their returns.
- Offer insights into guest satisfaction and its influence on listing success, aiding hosts in improving their services and attracting more bookings.
- Facilitate better predictions, visualizations, and strategies for both hosts and investors in the Airbnb market.

RESOURCES - <https://insideairbnb.com/get-the-data/>

Type	Filename	Description
Detailed Listings Data	listings.csv.gz	Contains comprehensive details about each listing, including property characteristics, host information, and pricing.
Detailed Calendar Data	calendar.csv.gz	Includes daily availability and pricing information for each listing.
Detailed Review Data	reviews.csv.gz	Contains reviews left by guests, including review text and ratings.
Summary Listings Data	listings.csv	Provides summary metrics and information for listings, useful for visualizations.
Summary Review Data	reviews.csv	Offers summary review data linked to listing IDs, facilitating time-based analytics and visualizations.
Neighborhood Data	neighbourhoods.csv neighbourhoods.geojson	Lists neighborhoods for geo-filtering and provides GeoJSON files for mapping neighborhood boundaries.

DEVELOPMENT PLAN

MILESTONE ASSIGNMENT #1

Phase	Objective	Activities	Tools	Member Responsibility	Timeline
Business Understanding	Define project goals and success criteria. Understand business context and requirements. Identify key stakeholders and their expectations.	<ul style="list-style-type: none"> - Define project goals and success criteria. - Understand business context and requirements. - Identify key stakeholders and their expectations. - Confirm Data Source 	Microsoft Teams, Microsoft Word	<ul style="list-style-type: none"> - All team members will collaborate to define project goals and success criteria. - Technical lead and Conceptual Lead will confirm availability and access technical requirements and tools to ensure that the project aligns with business objectives. 	2 weeks Due By: 6/1
Data Understanding	Gather and explore data related to Airbnb listings, including property features, host details, neighborhood characteristics, and guest reviews.	<ul style="list-style-type: none"> - Collect data from Airbnb and other relevant sources. - Perform initial data exploration and visualization. - Assess data quality and completeness. - Determine Parameters 		<ul style="list-style-type: none"> - Technical Lead will gather and explore data. Assess data quality and completeness. - PM/Conceptual Lead will determine parameters that align with business goals. Conceptualize the design elements that will be used to visualize the data and insights. - Explore data and determine parameters that align with business goals. 	2 weeks Due By: 6/15
Data Preparation	Clean, preprocess, and transform data to make it suitable for analysis.	<ul style="list-style-type: none"> - Handle missing values and outliers. - Encode categorical variables. - Normalize and scale numerical features. - Merge datasets and create new features. 	Python (Pandas, Scikit-learn), Jupyter Notebooks	<ul style="list-style-type: none"> - All team members will collaborate to clean, preprocess, and transform data to make it suitable for analysis. Ensure that the data preparation aligns with business requirements and supports the project's objectives. 	

MILESTONE ASSIGNMENT #1

Phase	Objective	Activities	Tools	Member Responsibility	Timeline
Modeling	Develop predictive models to estimate Airbnb listing prices and identify clusters of neighborhoods.	<ul style="list-style-type: none"> - Split data into training and testing sets. - Train various machine learning models. - Evaluate model performance using appropriate metrics. - Perform clustering analysis on neighborhood data. 	Python (Scikit-learn, Keras), Jupyter Notebooks	<ul style="list-style-type: none"> - Technical lead will perform machine learning - PM/Conceptual Lead will develop data model in Power Bi - Business Analyst will evaluate performance of all models 	<p>2 weeks</p> <p>Due By: 7/6</p>
Evaluation	Assess the models' performance and validate results.	<ul style="list-style-type: none"> - Compare model predictions with actual prices. - Validate clustering results. - Perform cross-validation and hyperparameter tuning. - Analyze sentiment in guest reviews and correlate with pricing and availability. 	Python (Scikit-learn, NLTK, VADER), Jupyter Notebooks	<ul style="list-style-type: none"> - All team members will collaborate to cross peer review modeling results to determine adequacy and accuracy against project goals. 	
Dashboard Development	Build a Power BI dashboard to visualize and communicate findings.	<ul style="list-style-type: none"> - Design the layout and structure of the dashboard. - Integrate geospatial data. - Create interactive visualizations. - Include insights on Airbnb investment and super host status. 	Power BI, Python, GIS tools (e.g., QGIS)	<ul style="list-style-type: none"> - The final design of and development of the dashboard will be divided among three subject areas: general, investor and superhost. Each team member will take responsibility for developing the layout of their respective pages and then collaborate to develop the underlying coding to support the output. 	<p>2 weeks</p> <p>Due By: 7/20</p>
Data-Informed Decision Making	Complete the conclusion and recommendation of the report, as well as the limitations of the project.	<ul style="list-style-type: none"> - Summarize key findings and insights. - Provide actionable recommendations. - Discuss project limitations and future research areas. 	Microsoft Word, Microsoft Teams	<ul style="list-style-type: none"> - All team members will collaborate to finalize the report and recommend changes, corrections as needed. - The project manager will be responsible for compiling the final draft. 	<p>1 week</p> <p>Due By: 7/27</p>

MILESTONE ASSIGNMENT #1

Phase	Objective	Activities	Tools	Member Responsibility	Timeline
Project Submission	Deploy the final models and visualizations for stakeholders.	<ul style="list-style-type: none">- Create interactive dashboards and visualizations.- Prepare final reports and presentations.- Deploy models to a web application or cloud service.	Power BI, Flask or Django, AWS or Azure	<ul style="list-style-type: none">- Team presentation	8/3/2025