**Methodology Document: Exploratory Data Analysis (EDA) on Airbnb NYC Dataset**

**Introduction**

The methodology aims to conduct a comprehensive Exploratory Data Analysis (EDA) on the Airbnb NYC dataset. The dataset includes various features related to properties listed on Airbnb in New York City.

**Data Collection and Preparation**

* Data Importing: Utilized Pandas library to read the dataset ('AB\_NYC\_2019.csv').
* Data Understanding: Displayed the first few rows to gain an initial understanding of the data structure.

**Feature Engineering and Categorization**

* Availability, Nights, Reviews, and Pricing Categories: Categorized columns including 'availability\_365', 'minimum\_nights', 'number\_of\_reviews', and 'price' into five distinct categories using defined conditional functions.

**Data Cleaning and Column Adjustments**

* Data Type Corrections: Transformed the 'last\_review' column to 'datetime64' data type.
* Column Adjustments: Identified categorical, numerical, coordinates, and date columns and displayed their content for a preliminary understanding.

**Missing Values Analysis**

* Evaluation of Missing Values: Investigated the presence of missing values in columns, specifically focusing on 'last\_review' and 'reviews\_per\_month' columns.

**Univariate Analysis**

* Exploration of Features: Analyzed individual features including 'host\_name', 'neighbourhood\_group', 'price', 'minimum\_nights', 'number\_of\_reviews', 'reviews\_per\_month', 'calculated\_host\_listings\_count', and 'availability\_365'.
* Visualization: Utilized various visualizations such as bar plots, box plots, histograms, and pie charts to understand the distributions and characteristics of different features.

**Bivariate and Multivariate Analysis**

* Correlation Analysis: Explored correlations among numerical columns using correlation matrices and visualizations.
* Top Correlations: Identified and examined top meaningful correlations within the dataset.
* Relationship Analysis: Studied the relationships between room types, number of reviews, prices, and availability for further insights.

**Data Saving**

* Export of Updated Data: Saved the manipulated dataset to 'AB\_NYC\_2019\_updated.csv' after categorization and adjustments.

**Conclusion and Recommendations**

* Insights: Derived insights into the impact of various categories on prices, reviews, and customer preferences.
* Recommendations: Suggested adjustments such as keeping minimum nights lower, modifying prices for higher availability, and understanding property features more customer-oriented.

**Implications**

* This methodology provides a foundation for making data-driven decisions and more in-depth analyses related to Airbnb's business operations.

**Further Steps**

The methodology serves as a basis for future advanced analyses, predictive modelling, and strategic decision-making in the context of Airbnb's property listings.