Data Methodology for Airbnb Storytelling Case Study (using Python and Tableau)

1. Data Collection:
  - Gather Airbnb datasets from Upgrad learn portal.

2. Data Cleaning and Preprocessing:
  - Use Python libraries like `pandas` to clean and preprocess the dataset.
    - Remove duplicates: Identify and remove any duplicate listings or reviews.
    - Handle missing values: Use methods such as filling in missing data (e.g., median for numeric values or mode for categorical) or removing rows with significant missing data.
    - Convert data types: Ensure the appropriate data types for each variable (e.g., convert date columns to datetime format).
    - Data normalization: Normalize numeric data like prices and ratings for comparison.

3. Data Exploration and Analysis:
  - Conduct exploratory data analysis (EDA) using Python's `matplotlib` and `seaborn` for visual insights into trends such as:
    - Distribution of prices, booking trends over time, occupancy rates.
    - Host activity, cancellation rates, and customer reviews.

4. Geospatial Data Visualization:
  - Use Python's `geopandas` or `folium` for geospatial mapping of Airbnb listings to show geographic distribution and location-specific analysis.
  - Plot neighborhoods or cities to highlight high-demand areas or customer preferences based on location.

5. Data Visualization using Tableau:
  - Import the cleaned dataset from Python into Tableau for interactive data visualization.
    - Create dashboards to visualize key metrics such as revenue trends, occupancy rates, and customer reviews.
    - Use Tableau's geographic mapping tools to visualize location-based data (e.g., heat maps of popular Airbnb areas).
    - Create time series plots to show how the business recovered post-COVID, illustrating changes in bookings and revenue over time.
  - Combine different types of plots (bar charts, line charts, pie charts, and maps) for a compelling storytelling presentation.

6. Storytelling Insights:
  - Use Tableau to create a narrative-driven dashboard that shows Airbnb's journey through the pandemic.
    - Visualize the impact of COVID-19 on revenue and bookings, followed by the recovery as travel resumed.
    - Highlight key insights such as changes in customer behavior, pricing strategies, or popular destinations.

7. Conclusion and Recommendations:
   - Based on the analysis, summarize key findings like booking trends, price optimization, or emerging travel hotspots.
   - Offer data-driven recommendations for Airbnb, such as marketing strategies for high-demand areas, dynamic pricing, or strategies to improve customer experience.

This methodology integrates Python for data processing and exploration, and Tableau for advanced visual storytelling, creating a comprehensive case study for Airbnb's business recovery analysis.