Hotel Booking Data Analysis and Visualization

In this project, I performed an in-depth analysis of a hotel bookings dataset, focusing on reservation patterns, cancellation rates, and pricing trends. The key tasks included:

1. **Data Cleaning and Preprocessing**:
   - Loaded and examined the dataset to understand its structure and identify any inconsistencies.
   - Converted date columns into appropriate datetime formats for time-series analysis.
   - Addressed missing data by dropping irrelevant columns and filtering out anomalies (e.g., extreme ADR values).
2. **Exploratory Data Analysis (EDA)**:
   - Analyzed categorical variables to uncover unique values and distribution patterns.
   - Conducted a thorough examination of cancellation rates, revealing that a significant portion of reservations were canceled, which could impact revenue and occupancy forecasting.
3. **Visualization and Insights**:
   - Created a bar plot to visualize the overall reservation status, highlighting the proportion of canceled versus non-canceled bookings.
   - Analyzed cancellation trends across different hotel types (Resort vs. City Hotel) using count plots. This revealed that City Hotels experienced higher cancellation rates compared to Resort Hotels.
   - Conducted a time-series analysis of the Average Daily Rate (ADR) for both hotel types, uncovering distinct pricing trends and seasonal variations.
   - Explored monthly reservation patterns, identifying peak and off-peak seasons, along with their respective cancellation rates.

These visualizations and insights provide valuable information for optimizing pricing strategies, improving booking policies, and enhancing revenue management for hotels. This project showcases my ability to clean, analyze, and derive actionable insights from complex datasets using Python, Pandas, Seaborn, and Matplotlib.