**Hotel Bookings Cancellation Analysis**

### **Introduction:**

Hotel booking cancellations can significantly impact a hotel's revenue and operational efficiency. Analyzing cancellation data helps identify patterns and factors contributing to cancellations, enabling hotels to develop strategies to reduce cancellations and improve customer satisfaction.

### **Objectives:**

The primary objectives of this analysis are:

* Identify key factors leading to booking cancellations.
* Understand cancellation patterns across different market segments.
* Develop predictive models to forecast cancellations.
* Provide actionable insights to reduce the rate of cancellations.

**Rationale:**

The analysis of hotel booking cancellation data can provide valuable insights into customer behavior, operational inefficiencies, and opportunities for improvement. By understanding cancellation trends and factors, the hotel can make informed decisions to reduce cancellations, optimize resource allocation, and improve customer satisfaction.

**Methodology:**

**1 Data Preprocessing**

* **Data Cleaning**: Handle missing values and outliers.
* **Date Conversion**: Convert reservation\_status\_date field object to datetime.

**2 Exploratory Data Analysis (EDA)**

* **Descriptive Statistics**: Summarize key statistics of the data.
* **Visualization**: Use plots (bar charts, pie charts, countplot, Line plot) to identify patterns and relationships.
* **Segmentation Analysis**: Analyze cancellation rates across different market segments.

**3 Insights and Recommendations**

* **Cancellation Patterns**: Identify factors associated with high cancellation rates.
* **Strategic Recommendations**: Provide actionable insights to reduce cancellations and improve customer experience.

### **Dataset:**

Dataset link is given here :

<https://www.kaggle.com/datasets/mojtaba142/hotel-booking>

### **Tools and Technologies:**

The analysis will be conducted using the following tools and technologies:

* **Python**: Programming language for data analysis.
* **Pandas**: Data manipulation and analysis library.
* **Matplotlib and Seaborn**: Visualization libraries.

**Expected Outcomes:**

1. **Cancellation Rate Insights:**
   * Determine the overall percentage of cancelled and non-cancelled bookings.
   * Compare cancellation rates between Resort Hotels and City Hotels to identify which type has higher cancellation rates.
2. **Seasonal Trends Analysis:**
   * Identify months with the highest and lowest number of cancellations.
   * Visualize monthly cancellation patterns to understand seasonal trends.
3. **Average Daily Rate (ADR) Insights:**
   * Analyze the trend of the average daily rate over time for both Resort Hotels and City Hotels.
   * Identify peak and off-peak periods for ADR to inform pricing strategies.
4. **Regional Insights:**
   * Identify the top 10 countries with the highest number of cancellations.
   * Understand regional differences in booking and cancellation behaviors.
5. **Market Segment Analysis:**
   * Compare the distribution and cancellation rates among different market segments (e.g., groups, individuals).
   * Analyze revenue generated from each market segment to identify the most and least profitable segments.
6. **Actionable Recommendations:**
   * Provide strategic recommendations to reduce booking cancellations, such as targeted marketing campaigns, flexible booking policies, and improved customer communication.
   * Suggest operational improvements based on the insights gained from average daily rate trends and seasonal patterns.

**Conclusion:**

The analysis of the hotel booking cancellation dataset will provide a comprehensive understanding of cancellation patterns and their underlying causes. By leveraging data analysis and visualization, the project will deliver detailed insights and actionable recommendations, enabling stakeholders to make data-driven decisions to reduce cancellations and enhance business performance.