**HOTEL BOOKING ANALYSIS**

**PROBLEM STATEMENT**

Have you ever wondered when the best time of year to book a hotel room is? Or the optimal length of stay in order to get the best daily rate? What if you wanted to predict whether or not a hotel was likely to receive a disproportionately high number of special requests? This hotel booking dataset can help you explore those questions! This data set contains booking information for a city hotel and a resort hotel, and includes information such as when the booking was made, length of stay, the number of adults, children, and/or babies, and the number of available parking spaces, among other things. All personally identifying information has been removed from the data.

**AIM**

The project aims to gain interesting insight into customers’ behavior when booking a hotel. The demand for different segment of customer may differ and forecasting become harder as it may requires different model for different segment.These insights can guide hotels to adjust their customer strategies and make preparation for unknown.

#### **HARDWARE REQUIREMENTS:**

1. **Processor**: Intel Core i5 or equivalent (minimum), Intel Core i7 or higher (recommended)
2. **RAM**: 8 GB (minimum), 16 GB or more (recommended)
3. **Storage**: 256 GB SSD (minimum), 512 GB SSD or more (recommended)
4. **Graphics**: Integrated graphics for basic visualization, dedicated GPU for more intensive visualizations
5. **Display**: Full HD monitor (1920x1080 resolution) or higher
6. **Internet Connection**: Stable internet connection for downloading datasets and libraries

#### **SOFTWARE REQUIREMENTS:**

1. **Operating System**:

* Windows 10 or higher
* macOS 10.14 (Mojave) or higher
* Linux (any modern distribution)

1. **Programming Languages**:

* Python 3.6 or higher

1. **Python Libraries**:

* **pandas**: For data manipulation and analysis
* **numpy**: For numerical operations
* **matplotlib**: For basic plotting and visualization
* **seaborn**: For advanced data visualization
* **scikit-learn**: For machine learning algorithms (if needed for deeper analysis)
* **Jupyter Notebook** or **JupyterLab**: For interactive coding and visualization

1. **IDE/Text Editor**:

* Jupyter Notebook/JupyterLab (recommended for EDA)
* Visual Studio Code
* PyCharm

**SUMMARY**

This EDA project on Hotel Booking Analysis investigates cancellations and their underlying patterns, aiming to suggest measures to reduce cancellations and secure revenue. The analysis covers booking information for both a city hotel and a resort hotel, including details such as booking dates, length of stay, and the number of adults and children. The project provides an overview of the EDA and visualization process.

The exploratory data analysis (EDA) aims to uncover insights from the dataset, which includes measures to reduce cancellations and secure revenue. For instance, hotels can offer discounts or promotions to customers who book early or for longer stays. Additionally, incentives such as free parking or breakfast can be offered to customers who book directly with the hotel instead of through third-party websites.

The EDA process involves several steps:

* **Exploration and Inspection**: Initial exploration and inspection of the raw data to understand its structure and content.
* **Data Cleaning**: Handling data impurities by addressing null values and dropping irrelevant data to ensure the dataset is clean and ready for analysis.

The analysis is divided into three types:

* **Univariate Analysis**: This is the simplest form of analysis, focusing on one variable at a time to understand its distribution and key characteristics.
* **Bivariate Analysis**: This involves comparing two variables to study their relationships and interactions.
* **Multivariate Analysis**: Similar to bivariate analysis but involves comparing more than two variables to understand complex relationships.

By analyzing hotel booking data and understanding cancellation patterns, the project concludes that hotels can take effective steps to reduce cancellations and increase revenue. The findings suggest practical measures such as offering early booking discounts, longer stay promotions, and direct booking incentives, which can help hotels mitigate cancellations and enhance their financial performance.