**Title:** Comprehensive Room Management System with Price Prediction Integration

**Objective:** Develop a web-based Room Management System using Flask (a Python web framework) and HTML/CSS for the frontend. The system should incorporate Object-Oriented Programming (OOP) principles for effective data management and include robust error handling mechanisms. Additionally, the system should feature a price prediction module to forecast room rates based on historical data and user inputs.

Single side(Admin side) interface

UseCase:

**Python Fundamentals:**

**Data Structures**: storing the list of rooms and booked rooms

**Classes**: Creating a Room and Booking

**Error Handling**: User Inputs, internal functioning errors

**Backend**: Flask

**Frontend**: HTML CSS

**Analytics and Regression:**

Dataset: To be prepared using various attributes of a room

**Accessing Data:** Pandas, numpy

EDA on the data (number of rooms(frequency), prices vs room\_types… and so on could be added while development)

Training model on the prepared dataset,

Price predictions and suggestions at the time of adding room(if possible)/ normal extra tab to show the

**1. Room Type**

* **Standard:** Basic amenities with no additional features.
* **Deluxe:** Enhanced features or additional space.
* **Suite:** High-end amenities, multiple rooms, and premium services.
* **Private:** Exclusive and secluded options with extra privacy.

**2. Room Size and Layout**

* **Square Footage:** Larger rooms generally command higher prices.
* **Layout:** Rooms with better layouts or additional features (e.g., separate living areas) may be priced higher.

**3. View and Location**

* **Sea Facing:** Rooms with a sea or lake view often have higher rates.
* **City View:** Rooms with attractive city views can also command a premium.
* **Proximity to Attractions:** Rooms close to popular attractions or convenient locations may be priced higher.

**4. Amenities and Features**

* **Jacuzzi/Hot Tub:** Availability of a private jacuzzi or hot tub in the room.
* **Balcony/Terrace:** Rooms with private outdoor spaces can be priced higher.
* **High-End Fixtures:** Luxurious bathroom fittings, high-quality furniture, and modern décor.

**5. Bed Type and Configuration**

* **King/Queen Beds:** Larger and more comfortable beds can justify a higher price.
* **Additional Beds:** Rooms with extra beds or sofa beds may be priced higher for accommodating more guests.

**6. In-Room Technology and Entertainment**

* **Smart TVs:** Rooms with advanced entertainment systems or streaming capabilities.
* **High-Speed Internet:** Availability of high-speed internet or Wi-Fi.

**7. Services and Inclusions**

* **Breakfast Included:** Rooms with complimentary breakfast or other meals.
* **Room Service:** Availability of in-room dining and other services.
* **Housekeeping:** Frequency and quality of housekeeping services.

**8. Seasonal and Demand Factors**

* **Seasonal Rates:** Prices can vary based on the time of year, holidays, and local events.
* **Demand and Supply:** Pricing adjustments based on occupancy rates, local events, or peak seasons.

**9. Location within the Property**

* **Floor Level:** Higher floors with better views or more privacy may be priced higher.
* **Proximity to Elevators or Facilities:** Rooms closer to amenities like pools or gyms might have different pricing.