PROJECT PROPOSAL

On

Hotel Management System

Course - Bachelor's of Computer and Applications

Submitted to

The Regional Director of Regional Centre

Submitted by
Khushboo Thakur
Enrollment Number 2003034820

Contents

1. INTRODUCTION

A Hotel is an establishment that provides for services such as accommodations, meals, and other services for travelers and tourists. Accommodation can be for any purpose such as overnight stay, holidays, business stay, transit etc.

The Hotel Management System is a robust and versatile software solution designed to streamline and optimize the day-to-day operations of a hotel or hospitality establishment. Leveraging the power of Python programming language, this system offers an integrated platform that encompasses a wide array of functionalities, aiming to enhance efficiency, improve guest services, and facilitate effective management.

Hotel Management System is a Web based application which is written in Python. This is a simple Web based system which is very easy to understand and use. Talking about the system, it contains all the basic functions which include entering customer's data, calculating room rent, restaurant bill, laundry bill, game bill, and total cost. Talking about the features of this Simple Hotel Management System, at first, the admin has to login and has to enter customer data. It includes the name, address, check-in, and check-out dates of the customer. Moreover, the user can calculate room rents. Inside this section, there are different types of rooms with different prices. After selecting the room type, the system asks to enter the number of nights spent in order to calculate room rent. This simple system also contains other functions such as calculating restaurant, laundry and game bill. When the user selects to calculate restaurant bill, the system displays a small menu. From there the user has to select foods and then it displays the total restaurant bill. The other remaining features; calculating laundry and game bill also follow the same procedure as of calculating restaurant bill.

2. OBJECTIVES

Currently in hotel all the work done manually when a guest make a reservation, all the reservation details(including guest details) are recorded in a hotel register. At the time of checkout of customer, calculations of bills and inventory items are done manually too. Doing all the work manually and storing information on register takes much time. Manually calculation of bill is also error prone. If management wants any old information like room recorder reservation details then finding old records is very tiresome task and it takes a lot of time to find records form old files.

The main objective of the Project on Hotel Management System is to manage the details of Hotel, Rooms, Services, Payments, and Bookings. It manages all the information about Hotel, Customers, Bookings, Hotel. The project is totally built at administrative end and thus only the administrator is guaranteed the access. The purpose of the project is to build an application program to reduce the manual work for managing the Hotel, Rooms, Customers, and Services. It tracks all the details about the Services, Payments, and Bookings.

Automated Check-in and Check-out: The system minimizes wait times and enhances the overall guest experience. Reduce front desk workload, enhancing overall guest satisfaction with prompt service.

Automated Billing and Invoicing: Automate the billing system to generate accurate bills, including room charges, additional services, and taxes. Provide customizable invoices for guests and ensure a transparent and efficient payment process.

The overarching goal is to create a Python-based Hotel Management System that not only automates and optimizes internal processes but also elevates the guest experience, contributing to the success and competitiveness of the hotel in the hospitality industry.

3. Project Category

This Hotel Management System will be developed using the Python language and will use the Expert system for its functions and automate the work of the Hotel Management. This system integrates knowledge-based reasoning to enhance efficiency, service quality, and optimize overall hotel operations.

Decision Support System: Implementing an expert system that provides intelligent decision support for tasks such as room allocation, pricing strategies, and staff scheduling.

Knowledge Base: Developing a comprehensive knowledge base that includes information about guest preferences, historical data, and industry best practices to facilitate informed decision-making.

Automated Problem Resolution: Implementing an expert system to diagnose and resolve common issues, improving response times and minimizing operational disruptions.

Dynamic Pricing Recommendations: Incorporating an expert system to analyze market trends, demand patterns, and other factors to recommend dynamic pricing strategies for rooms and services.

Personalized Guest Experience: Utilizing the expert system to analyze guest profiles, preferences, and past interactions to offer personalized recommendations, amenities, and services.

Continuous Learning Mechanism: Incorporating machine learning capabilities to enable the system to adapt and improve over time based on new data, trends, and guest feedback.

User Interface: Developing a user-friendly interface to interact with the expert system for configuration and monitoring.

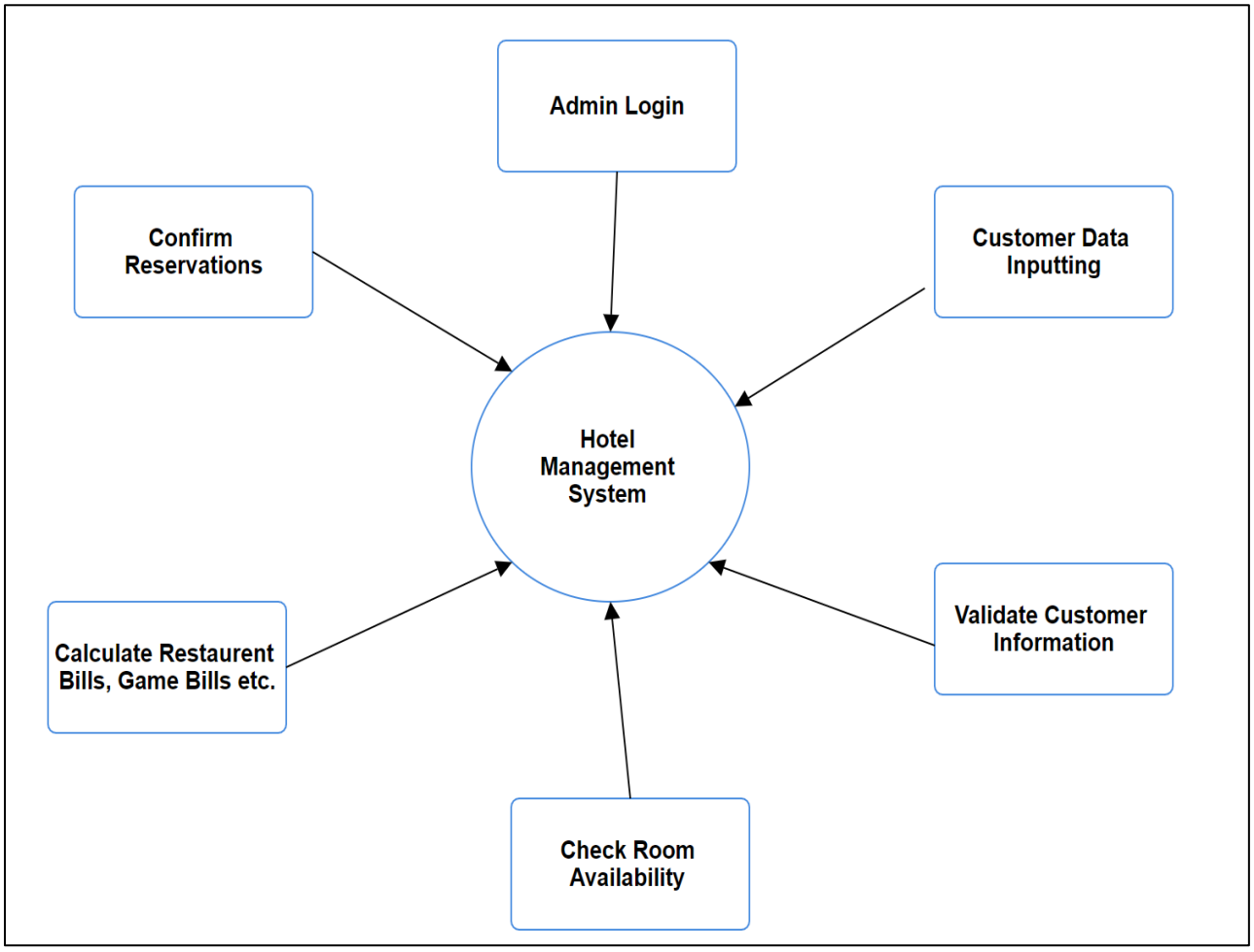
This Expert System for Hotel Management aims to redefine the hotel experience by automating decision-making processes, enhancing guest satisfaction, and optimizing operational efficiency.

4. Analysis

4.1 Data Flow Diagrams (DFDs):

4.1.1. Level 0 DFD:

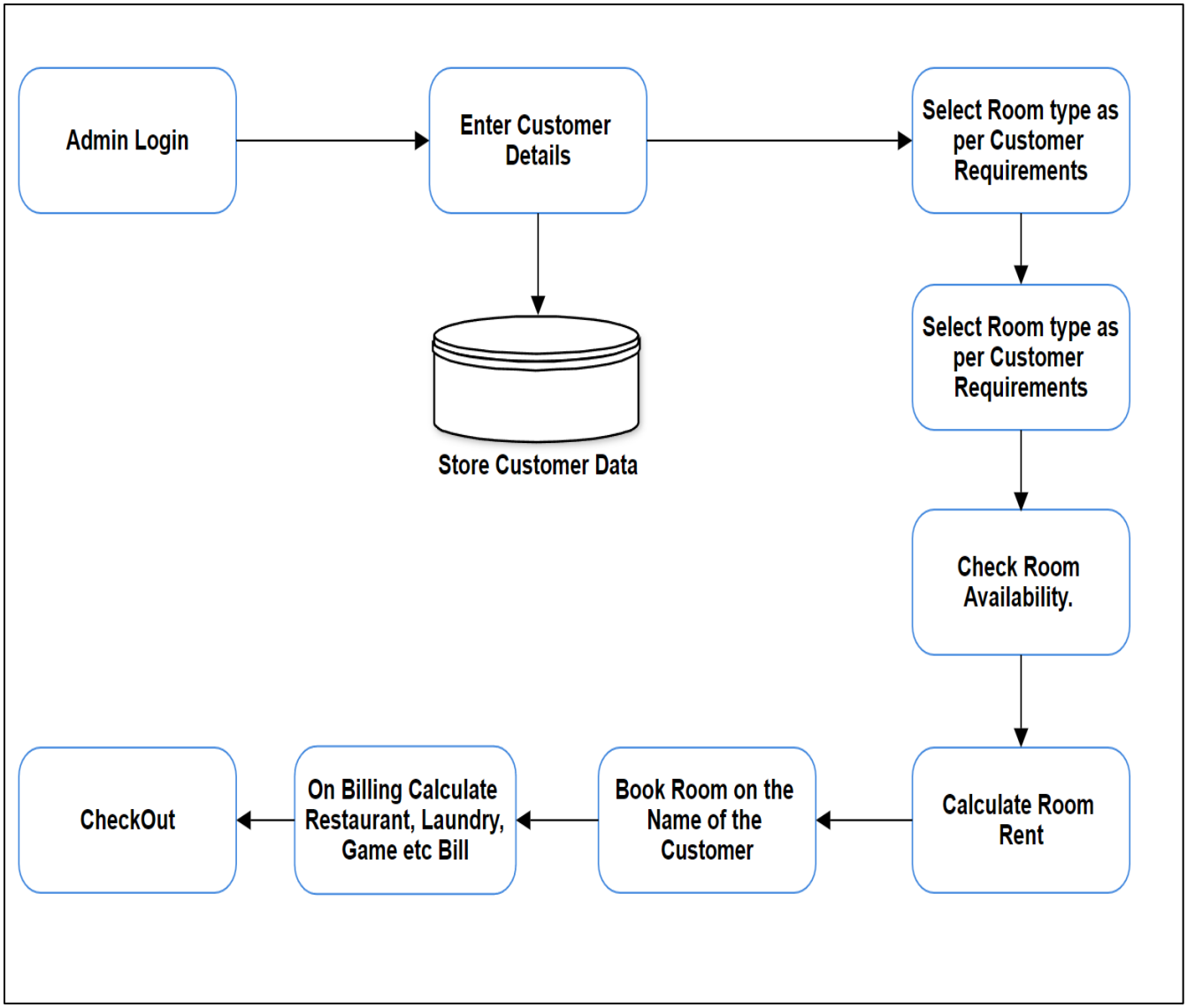
- This is the highest-level DFD, which provides an overview of the entire system.
- It shows the major processes, data flows, and data stores in the system, without providing any details about the internal workings of these processes.



DFD Level-0

4.1.2 Level 1 DFD:

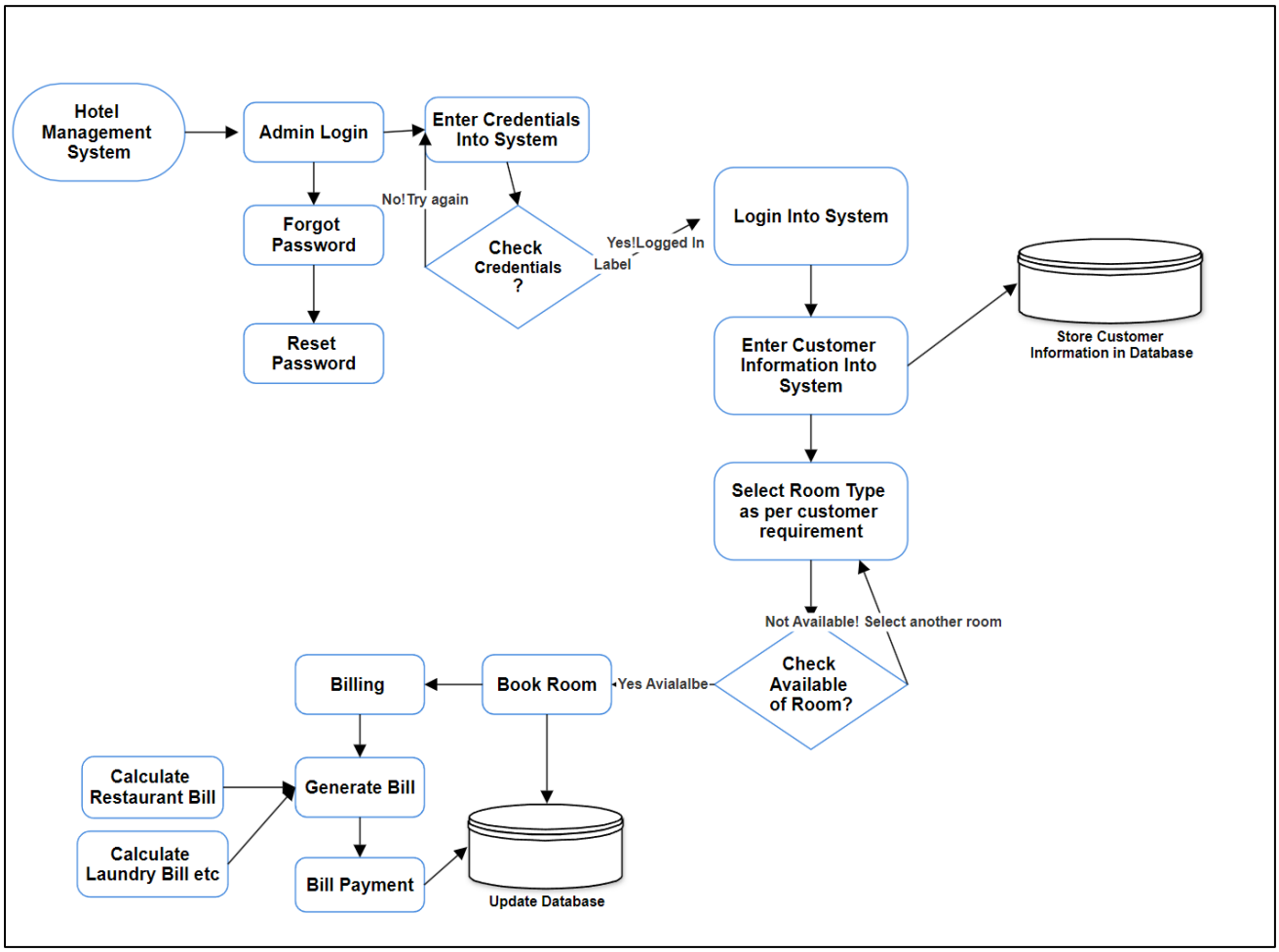
- This level provides a more detailed view of the system by breaking down the major processes identified in the level 0 DFD into sub-processes.
- Each sub-process is depicted as a separate process on the level 1 DFD. The data flows and data stores associated with each sub-process are also shown.



DFD Level-1

4.1.3 Level 2 DFD

- This level provides an even more detailed view of the system by breaking down the sub-processes identified in the level 1 DFD into further sub-processes.
- Each sub-process is depicted as a separate process on the level 2 DFD. The data flows and data stores associated with each sub-process are also shown.



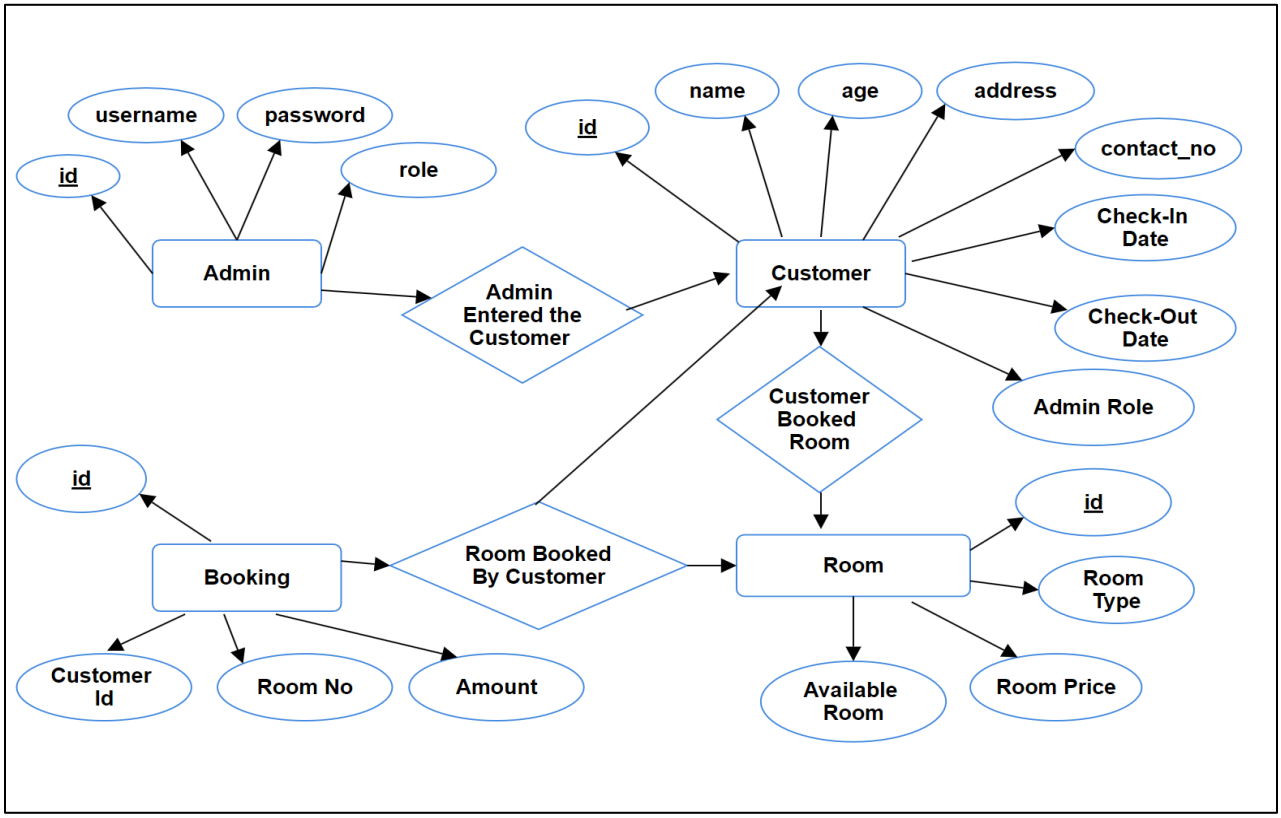
DFD Level 2

4.2 Entity-Relationship (ER) Diagrams

The Hotel Management System is proposed to have four tables to store the data at the different stages of the system.

The Entity in the Hotel management systems are:

1. Admin
2. Customer
3. Room
4. Booking



E-R Diagram of Hotel Management System

5. Complete Structure of Systems

5.2 Module Description:

- Reservation Module: Used for managing the details of Customers and the Hotel. Handles guest reservations, check-ins, and check-outs.
- Room Management Module: Used for managing the information and details of the Rooms. Handles room allocation, availability, and maintenance.
- Billing and Invoicing Module: Used for managing the Payments information. Manages guest billing and generates invoices
- Staff and Employee Module: Used for managing the Staff details. Manages staff details, roles, and schedules.
- Reporting and Analytics Module: Generates various reports for management analysis. Manages Hotel Revenue.

5.3 Data Structures:

Data Structures for Hotel Management System:

Entities:

- **Admin:**
  - Admin ID (Primary Key)
  - Username
  - Password
  - Role
- **Customer:**
  - Customer ID (Primary Key)
  - Name
  - Age
  - Address
  - Contact No
  - Check-In
  - Check-Out
  - Admin Role (Foreign Key)
- **Room:**
  - Room ID (Primary Key)
  - Room Type
  - Room Price
  - Available Room.
- **Booking:**
  - Booking Id (Primary Key)

- Customer Id(Foreign Key).
- Room No(Foreign Key).
- Amount.

5.3 Database Design:

Entities:

- **Admin:**
  - Admin ID (Primary Key)
  - Username
  - Password
  - Role
- **Customer:**
  - Customer ID (Primary Key)
  - Name
  - Age
  - Address
  - Contact No
  - Check-In
  - Check-Out
  - Admin Role (Foreign Key)
- **Room:**
  - Room ID (Primary Key)
  - Room Type
  - Room Price
  - Available Room.
- **Booking:**
  - Booking Id (Primary Key)
  - Customer Id(Foreign Key).
  - Room No(Foreign Key).
  - Amount.

5.4 Process Logic:

- **Reservation Module:**
  - Guest Makes a Reservation: - A new guest provides details including name, contact information, and reservation dates to the receptionist and he/she login to admin user and enter the guest information.

- System Checks Room Availability:- Then Admin user can ask for the quest to choose the type of room. And Admin user will check the system if the selected type of room is available or not.
- Reservation Created:- If rooms are available, a reservation record is created with the guest's details and the assigned room.
- Room Status Updated:- The status of the assigned room is updated to "Occupied."
- Total Amount Calculated:- The total amount for the reservation is calculated based on the room type and duration of stay.
- Reservation Confirmation:- The system confirms the reservation and provides the guest with a reservation ID and total amount.

- **Room Management Module:**

- Room Allocation:- When a reservation is made, the system allocates an available room to the guest.
- Room Status Update:- The system updates the status of the allocated room to "Occupied."
- Room Maintenance Schedule:- Staff schedules room maintenance based on the Room Maintenance Schedule.

- **Billing and Invoice Module:**

- Billing Generation:- When a guest checks out, the system generates a bill based on the reservation details.
- Total Amount Calculation:- The total amount is calculated considering the room charges and any additional services.
- Invoice Issued:- An invoice is issued to the guest, indicating the total amount to be paid.

- **Reporting and Analysis Module:**

- Occupancy Report Generation:- The system generates reports showing the occupancy percentage for specific dates.
- Revenue Report Generation:- Reports are generated to display the total revenue for specific dates.

5.5 Testing Details:

Testing is a crucial phase to ensure that each module of the Hotel Management System operates correctly

- **Reservation Module:**

1. Unit Testing:

Guest Entity:

- Test creation of a new guest record.
- Test retrieval of guest details.

Room Entity:

- Test creation of a new room record.
- Test retrieval of room details.

Reservation Entity:

- Test creation of a new reservation.
- Test retrieval of reservation details.

2. Integration Testing:

- Verify that a reservation is successfully created when a guest makes a reservation.
- Confirm that room availability is correctly checked during reservation creation.
- Check that the room status is updated to "Occupied" after a reservation is made.

3. System Testing:

- Conduct end-to-end testing of the reservation process, from guest input to reservation confirmation.
- Verify that total amounts are accurately calculated.
- Test the system's response to invalid reservation attempts.

- **Room Management Module:**

1. Unit Testing:

- Test room allocation process.
- Test updating room status to "Occupied" after allocation.
- Validate the room maintenance scheduling process.

2. Integration Testing:

- Confirm that room allocation occurs seamlessly during the reservation process.
- Check that the room status is updated correctly after check-in.

3. System Testing:

- Conduct end-to-end testing of the room allocation and check-in process.
- Verify that room maintenance schedules are accurately implemented.

- **Billing and Invoice Module:**

1. Unit Testing:

- Test the generation of a bill for a reservation.
- Validate the calculation of the total amount.
- Test the issuance of an invoice.

2. Integration Testing:
   - Confirm that billing details are accurately linked to the reservation.
   - Check that the total amount reflects room charges and additional services.

3. System Testing:
   - Conduct end-to-end testing of the billing process from check-out to invoice issuance.
   - Validate the accuracy of the total amount on the invoice.

- **Staff and Employees Module:**

1. Unit Testing:
   - Test the addition of new staff details.
   - Validate the editing of staff details.

2. Integration Testing:
   - Confirm that staff details are accurately linked to relevant modules.
   - Check that staff roles and schedules are correctly implemented.

3. System Testing:
   - Conduct end-to-end testing of the staff details management process.

- **Reporting and Analysis Module:**

1. Unit Testing:
   - Test the generation of occupancy reports.
   - Validate the generation of revenue reports.

2. Integration Testing:
   - Confirm that report data is accurate and up-to-date.
   - Check that reports are generated based on specified date ranges.

3. System Testing:
   - Conduct end-to-end testing of the report generation process.

5.6 Reports Generation:

- There will be Report of number of Revenue generated on Daily/Monthly/Yearly basis.

- Report of number of Room booked at present.
- Report of total number of Guest stayed at present in the Hotel.

6.Tools Used:

6.1 Software Requirements

- Web Browser.
- Frontend Languages: HTML, CSS, JS.
- Programming language-Python
- MySQL Database.

6.2 Hardware Requirements

- Operating System-Windows 10
- RAM 2 GB
- HDD 500 GB

7 Future scope:

The dynamic nature of the hospitality industry and technology, a Hotel Management System can have a wide range of future scopes and opportunities for further enhancement. Develop a mobile application for guests to make reservations, check-in, and access other services conveniently. Explore AI to optimize room allocation based on guest preferences and historical data. Implement chat bots for handling guest queries and providing assistance. Implement loyalty programs to encourage repeat business and enhance guest retention. Enable guests to share their experiences on social media directly from the system. Implement multi-language support for a more inclusive and global reach. Implement dynamic pricing strategies based on demand and seasonal trends. Enhance guest feedback and review mechanisms to gather valuable insights for continuous improvement. Integrate with third-party services, such as travel agencies, payment gateways, and external databases. Develop an advanced booking engine with real-time availability and personalized recommendations. The future scope and enhancement opportunities for a Hotel Management System are vast. Regularly assess industry trends, guest expectations, and technological advancements to stay ahead and continually improve the system. Collaboration with industry experts and gathering user feedback will be crucial in guiding future development efforts.