

# **“HOSTEL/PG TRACKING SYSTEM”**

*A  
Report*

**BACHELOR OF TECHNOLOGY  
in  
COMPUTER SCIENCE & ENGINEERING**

**by**

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# Abstract

“HOSTEL MANAGEMENT SYSTEM” is software developed for managing various activities in the hostel. For the past few years the numbers of educational institutions are increasing rapidly. Thereby the numbers of hostels are also increasing for the accommodation of the students studying in this institution. And hence there is a lot of strain on the person who are running the hostel and software's are not usually used in this context. This particular project deals with the problems on managing a hostel and avoids the problems which occur when carried manually.

Identification of the drawbacks of the existing system leads to the designing of computerized system that will be compatible to the existing system with the system which is more users friendly and more GUI oriented.

# **Introduction**

## **PROBLEM DEFINITION**

This system is designed in favor of the hostel management which helps them to save the records of the students about their rooms and other things. It helps them from the manual work from which it is very difficult to find the record of the students and the mess bills of the students, and the information of about the those ones who had left the hostel. All the hostels at present are managed manually by the hostel office. The Registration form verification to the different data processing is done manually. Thus there are a lot of repetitions which can be easily avoided. And hence there is a lot of strain on the person who are running the hostel and software's are not usually used in this context. This particular project deals with the problems on managing a hostel and avoids the problems which occur when carried manually Identification of the drawbacks of the existing system leads to the designing of computerized system that will be compatible to the existing system with the system which is more user friendly. We can improve the efficiency of the system, thus overcome the drawbacks of the existing system. We design this system of the hostel management especially for the college hostel, through this they cannot require so efficient person to handle and calculate the things. This system automatically calculates all the bills and issued the notifications for those students who are against some rules.

## **OBJECTIVES OF PROJECT**

This software product the hostel management to improve their services for all the students of the hostel. This also reduce the manual work of the persons in admin penal and the bundle of registers that were search when to find the information of a previous student, because through this system you can store the data of those students who had left the hostel . Through this you can check the personal profile of all the current students within few minutes the data base of the system will help you to check a particular one. The system will help you to check the mess bills of every student and the student's hostel dues. The students of the hostel will be recognized from the ID number allocated at the room rental time. In the last this system will improve the management work in the hostel.

- To automate each and every activity of the manual system, which

increases its throughput

- To provide a quick response with very accurate information as and when required
- To make the present manual system more interactive, speedy and user friendly
- To avail any information, whatever and whenever needed
- Reduce the cost of maintenance

## **System Analysis & Design**

The way that is followed while carrying on with the development application is as follows:

## **Defining problem**

Defining a problem is one of the important activities of the project. The objective is to define precisely the business problem to be solved & thereby determined the scope of the new system. This phase consist of 2 main tasks. The 1st task within this activity is to review the organization needs that originally initiated the project. The 2nd task is to identify, at an abstract or general level, the expected capabilities of the new system. Thus, it helps us to define the goal to be achieved & the boundary of the system. A clear understanding of the problem will help us in building a better system & reduce the risk of project failure. It also specifies the resources that have to be made available to the project. Three important factors project goal, project bounds & the resource limits are sometimes called the project's term of reference.

## **Feasibility study**

The systems objectives outlined during the feasibility study serve as the basic from which the work of system design is initiated. Much of the activities involved at this stage is of technical nature requiring a certain degree of experience in designing systems, sound knowledge of computer related technology and through understanding of computers available in the market and the various facilities provided by the vendors. Nevertheless, a system cannot be designed in isolation without the active involvement of the user. The user has a vital role to play at this stage too. As we know that data collected during feasibility study wills we utilized systematically during the system design. It should, however be kept in mind that detailed study of the existing system is not necessarily over with the completion of

the feasibility study. Depending on the plan of feasibility study, the level of detailed study will vary and the system design stage will also vary in the amount of investigation that still needs to be done

This investigation is generally an urgent activity during the system. Sometimes, but rarely, this investigation may form a separate stage between feasibility study and computer system design. Designing a new system is a creative process, which calls for logical as well as lateral thinking. The logical approach involves systematic moves towards the end product keeping in mind the capabilities of the personnel and the equipment at each decision making step. Lateral thought implies encompassing of ideas beyond the usual functions and equipment. This is to ensure that no efforts are being made to fit previous solutions into newsituations.

The feasibility study proposes one or more conceptual solutions to the problem set for the project. The objective in assessing feasibility is to determine whether a development project has a reasonable chance of success. It helps us to determine the input & output of the system. The following are the criteria that are considered to confirm the project feasibility.

*The following feasibility study was undertaken for the proposed system:*

**Technical feasibility:**

At first it's necessary to check that the proposed system is technically feasible or not & to determine the technology and skill necessary to carry out the project. If they are not available then find out the solution to obtain them. Hardware is already available in theUniversity.

*Economic feasibility:*

While considering economic feasibility, it is checked in points like performance, information and outputs from the system. The developing system must be justified by cost and benefit. Criteria to ensure that effort is concentrated on project , which will give best , return at the earliest. One of the factors , which affect the development of a new system , is the cost it would require.



*Social feasibility:*

Although generally there is always resistance, initially to any change in the system is aimed at reliving the work load of the users to extent the system is going to facilitate user to perform

Operations like calculating salary amounts and deductions, generating reports with less possible errors. Thus there is no reason to make system sociallyunfeasible.

# Modules & Features

## Module

There are two basic modules in this system as describe briefly in below

- **Administrative module:** This user is an admin type who has full rights on the system.

### *AdministrativeModule*

This module includes storing and retrieving the details of the data.

- Create , Update, Manage, Delete User
- Creating OfferPlan
- ManageBilling
- Manage User Enquiry throughEmail
- Manage OwnerInfo

## Features

There are many features in our system. Some salient and new features are:

- Login by FaceRecognition
- Phone number verification through SMS on signup
- Online PaymentGateway
- WebcamIntegration
- Activity Log ofUser's

There are three actors of the application which going to interact directly with the application Admin, Student, Warden and the visitors who are the indirect actor of the application.

### ADMIN:

Admin will be responsible to manage the details of all the students, Wardens and

room allotments. Like admin can a new user and view the list of existing users in the application.

Admin can ADD/DELETE/UPDATE user or students details.

Admin can ADD/DELETE/UPDATE the records of wardens.

Admin can check the activity of rooms in the hostel.

Admin can check the track the transaction related to payment of the student etc.

Admin can EDIT/Delete the visitor's details.

Student/User

Students can check their transaction and profile details.

Students can register and login to the application and manage the profile username and password.

Students can view all the transaction history and room booking details.

Wardens

Wardens have access to add new visitors to the application.

Wardens can manage the student details.

Wardens can check the room availability and manage the room allotment according to the requirement.

## Application Requirements(Software and technology)

### *UserInterface:*

- HTML has been used for developing the user layout for the system.
- Java and JavaScript has been used for creating all the validations and client side scripting functionality.
- CSS has been used for designing the web page of the system.

### *Application:*

- Client On Internet : Web Browser , Operating System(Any)
- Web Server :Apache
- Database :MySQL
- Markup Language: HTML, CSS
- Scripting Language : Java, Javascript, JQuery

# System Implementation

## 5.1 ImplementationMethodology

We follow the MVC design pattern for developing our system. Model–view– controller (MVC) is a software design pattern for implementing user interfaces on computers. It divides a given software application into three interconnected parts, so as to separate internal representations of information from the ways that information is presented to or accepted from theuser.

- **Model:** The model manages the behavior and data of the application domain, responds to requests for information about its state (usually from the view), and responds to instructions to change state (usually from thecontroller).
- **View:** The view manages the display ofinformation.
- **Controller:** The controller interprets the mouse and keyboard inputs from the user, informing the model and/or the view to change asappropriate.

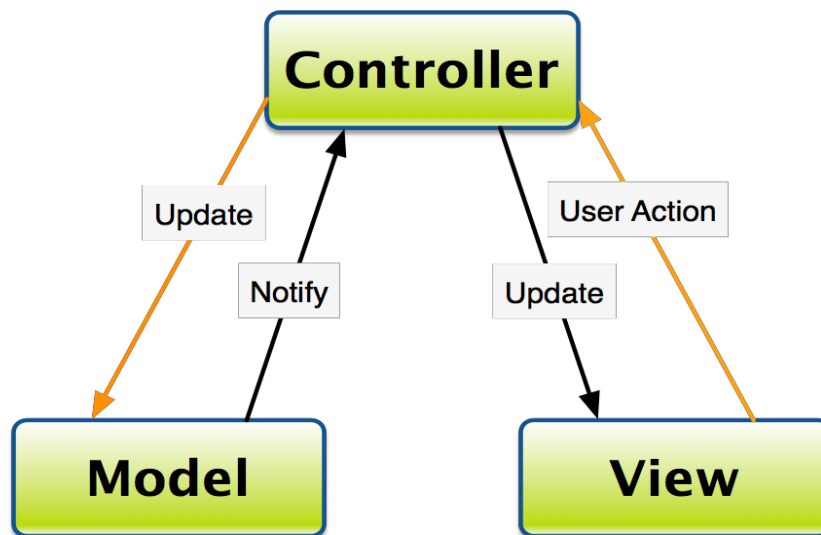


Fig. 5.1: Diagram of A typical collaboration of the MVC components.

## 5.2 Data FlowDiagram

A data flow diagram (DFD) is a graphical representation of the "flow" of data through an information system, modeling its process aspects. A DFD is often used as a preliminary step to create an overview of the system, which can later be elaborated.[2] DFDs can also be used for the visualization of data processing.

A DFD shows what kind of information will be input to and output from the system, where the data will come from and go to, and where the data will be stored. It does not show information about the timing of process or information about whether processes will operate in sequence or in parallel.

<Image>

## Entity Relationship Diagram

An entity-relationship diagram (ERD) is a graphical representation of an information system that shows the relationship between people, objects, places, concepts or events within that system. In software engineering an ER model is commonly formed to represent things that a business needs to remember in order to perform business processes. Consequently, the ER model becomes an abstract data model that defines a data or information structure that can be implemented in a database, typically a relational database.

An ER model is typically implemented as a database. In a simple relational database implementation, each row of a table represents one instance of an entity type, and each field in a table represents an attribute type. In a relational database a relationship between entities is implemented by storing the primary key of one entity as a pointer or "foreign key" in the table of another entity.

There is a tradition for ER/data models to be built at two or three levels of abstraction. Note that the conceptual-logical-physical hierarchy below is used in other kinds of specification, and is different from the three schema approach to software engineering.

<Image>

## Normalization

Database Normalization is a technique of organizing the data in the database. Normalization is a systematic approach of decomposing tables to eliminate data redundancy and undesirable characteristics like Insertion, Update and Deletion Anomalies. It is a multi-step process that puts data into tabular form by removing duplicated data from the relation tables.

- ☐ Normalization is used for mainly twopurpose,
- ☐ Eliminating redundant (useless)data.

Ensuring data dependencies make sense i.e. data is logically stored.

Without Normalization, it becomes difficult to handle and update the database, without facing data loss. Insertion, Update and Deletion Anomalies are very frequent if Database is notnormalized.

Normalization rule are divided into following normal form.

- ☐ First NormalForm
- ☐ Second NormalForm
- ☐ Third NormalForm
- ☐ BCNF

As per First Normal Form, no two Rows of data must contain repeating group of information i.e each set of column must have a unique value, such that multiple columns cannot be used to fetch the same row. Each table should be organized into rows, and each row should have a primary key that distinguishes it as unique.

As per **First Normal Form**, there are no repeating or duplicate fields in our database and each cell contains only a single value. For example:

As per First Normal Form, there are no repeating or duplicate fields in our database. Our system database does not have any column that has multiple repeating values. So our system database table is in first normal form.

As per Second Normal Form, Second normal form states that it should meet all the rules for 1NF and there must be no partial dependences of any of the columns on the primary key:

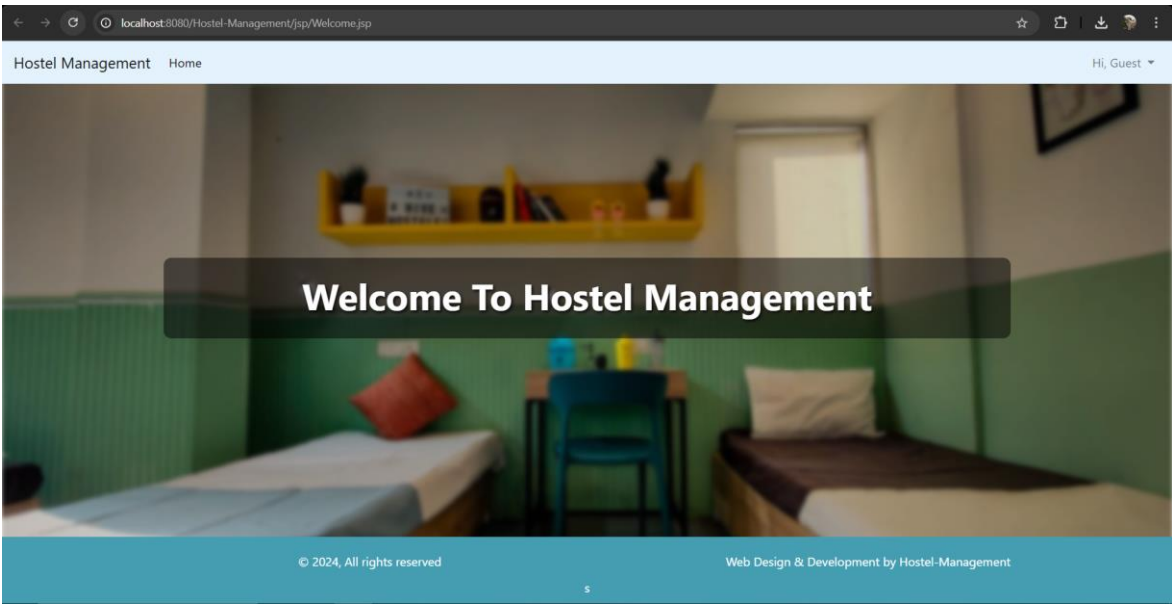
Let's check with another table of our database:

From the above table we can say it meets all the rules for 1NF and there is no column that depends on the primary key. SO our database table is also in Second Normal Form. In Third Normal Form, it should meet all the rules for 2NF and no non-key fields can depend upon another.

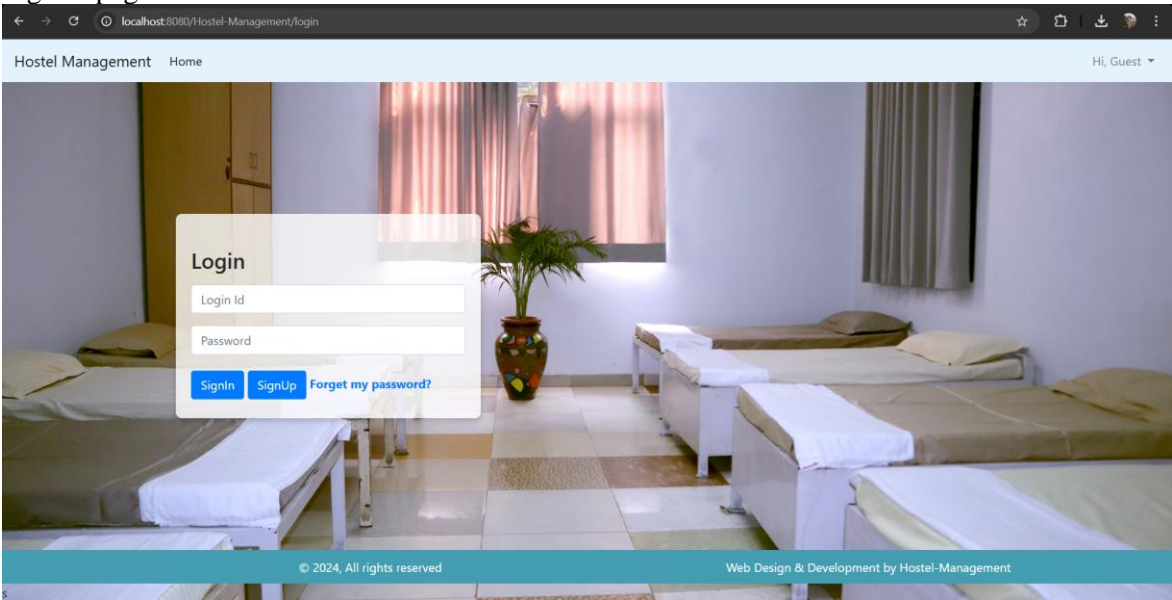
But from the above table we see, there is dependencies on two non-key value shift\_id and shift\_title . Shift title depends on shift id. So our system database table is not in 3NF.



# Screenshots



## Sign In page



## Registration Page

Registration

First Name

Last Name

Login Id

Password

Confirm Password

Mobile No.

-----Select----- ▾

Date Of Birth

Choose File

No file chosen

Profile pic must be 100X100

SignUp

 or 

Reset

Add User

-----Select----- ▾

First Name

Last Name

Admin@gmail.com

...

Confirm Password

Mobile No.

-----Select----- ▾

Date Of Birth

Choose File

No file chosen

Add Room

-----Select----- ▾

Room No

Description

Save

 or 

Reset


Warden List

Warden List

Search

or

Reset

Select	S.No	Profile	Name	Login Id	Hostel Name	Phone No.	Gender	Edit
<input type="checkbox"/>	1		Warden Warden	Warden@gmail.com	Demo	9695654565	Female	<div>Edit</div>

Allotment List

Allotment List

Search

or

Reset

S.No	Name	Hostel Name	Room No	Fee Status
1	Student Student	Demo	101	1000 Rs. Fee Remaining

Room List

Room List

Search

or

Reset

Select	S.No	Room No	Hostel Name	Description	Status	Edit
<input type="checkbox"/>	1	101	Demo	dcd	2 bed Available	<div>Edit</div>
<input type="checkbox"/>	2	102	Demo	dc	3 bed Available	<div>Edit</div>

# **Testing and Validation of the System**

## **Testing**

Software testing is the process of evaluation a software item to detect differences between given input and expected output. Also to assess the feature of A software item. Testing assesses the quality of the product. Software testing is a process that should be done during the development process. In other words software testing is a verification and validation process.

## **Verification**

Verification is the process to make sure the product satisfies the conditions imposed at the start of the development phase. In other words, to make sure the product behaves the way we want it to.

## **Validation**

Validation is the process to make sure the product satisfies the specified requirements at the end of the development phase. In other words, to make sure the product is built as per customer requirements.

Testing goes side by side with the implementation that is aimed at ensuring that the system works accurately and efficiently before the live operation is performed. The common view of testing held by the user is process of executing a program with explicit intention of handling errors. The application which has been developed has to be tested to prove its validity. Testing is considered to be the least creative phase

e of the whole cycle of system design. In the real sense it is the phase, which helps to bring out the creativity of the other phases, and makes it shine.

The Smart Movies Management System was tested using the following two techniques of application testing:

## **Unit Testing:**

- In the line of strategy the entire individual's function and modules were put to test independently
  - By following this strategy all the errors in coding were identified and corrected.
  - This method was applied in combination with the White Box and Black Box testing
- 
- Technique to find errors in each
  - The effort of specific combination of data on system operation was
  - The following were the tests carried out for Graphical User Interface(GUI).
  - It was seen that the pages open properly based on related menu-based commands.
  - It was tested whether all relevant menus, buttons, icons and other controls are available and properly

## **System Testing**

We use this testing method. System testing is the testing to ensure that by putting the software in different environments (e.g., Operating Systems) it still works. System testing is done with full system implementation and environment. It falls under the class of black box testing.

# Performance Testing

Performance testing is the testing to assess the speed and effectiveness of the system and to make sure it is generating results within a specified time as in performance requirements. It falls under the class of black box testing.

# Multi-user System Testing

Database Locking Schemes: Whenever more than one person is accessing a record/s some type of process must be used to prevent the other users from attempting to update the same record at the same time. This process is a locking scheme. In its simplest form, a locking scheme allows only one user at a time to update information in the database.

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# Swot Analysis

## Strengths:

1. **Ease of Booking:** The platform offers a user-friendly interface with real-time booking and search filters, simplifying the process for students to find and reserve accommodations.
2. **Robust Technology Stack:** Built using Java, Spring Boot, and MySQL, ensuring scalability, security, and reliability.
3. **Payment Integration:** Secure payment gateway support enhances user trust and provides seamless transaction experiences.
4. **Unique Features:** Incorporation of user reviews and filters for tailored search results adds value to the user experience.

## Weaknesses:

1. **First-time Database Integration:** Limited experience in database integration may lead to potential delays or initial system inefficiencies.
2. **Initial Cost:** Hosting and maintaining the application on servers like AWS might increase costs during the initial phases.
3. **Limited Market Exposure:** The system may initially struggle to compete with established booking platforms due to brand recognition.

## Opportunities:

1. **Market Demand:** Increasing demand for student accommodations due to

growing academic institutions and migration of students.

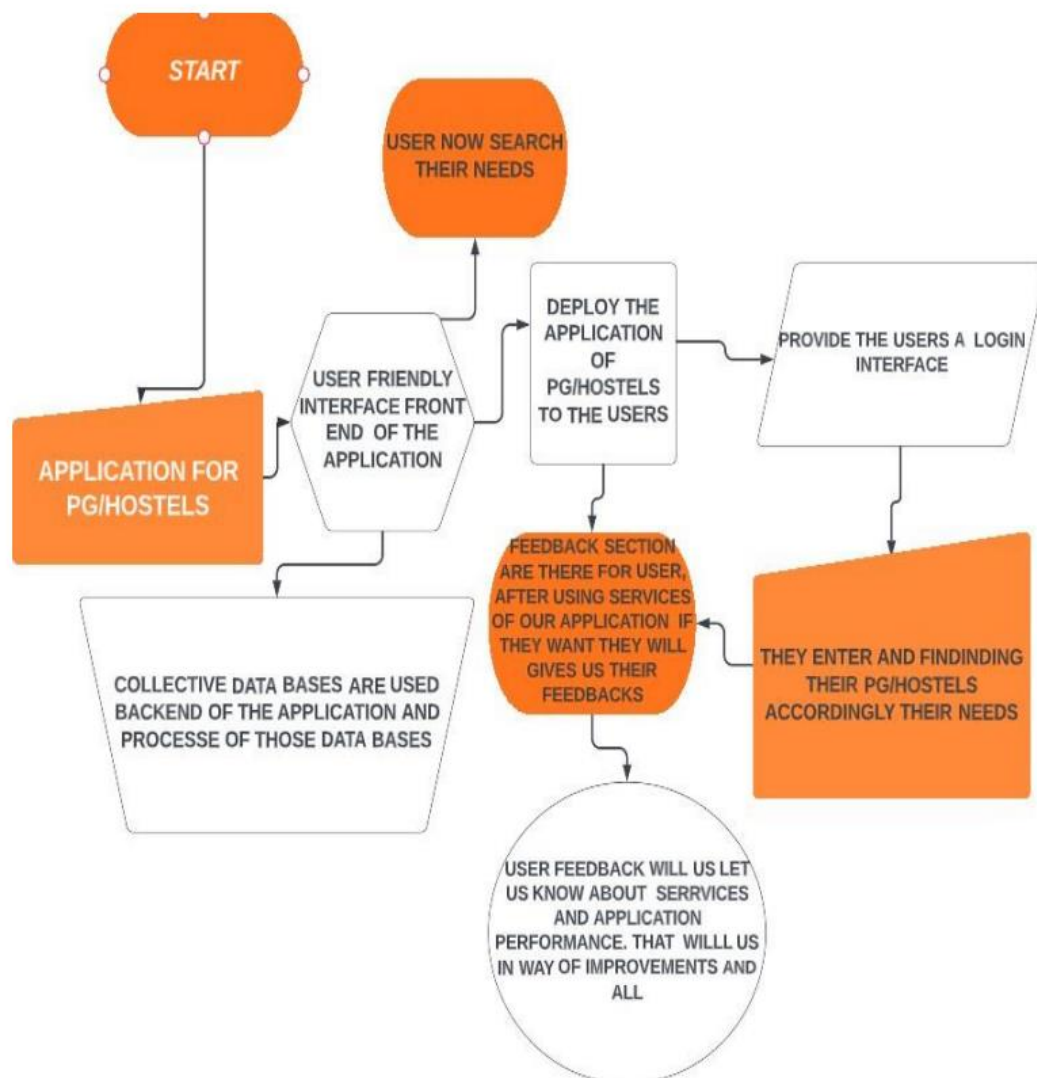
2. **Expansion Potential:** Opportunity to expand the platform to include additional features like roommate matching or integrating with nearby services (e.g., laundry or meal delivery).
3. **Collaboration:** Potential for partnerships with universities, colleges, and property owners to ensure exclusive listings and generate recurring revenue.
4. **Tech Growth:** Leveraging advanced features like machine learning for personalized recommendations or blockchain for secure payments.

## **Threats:**

1. **Competition:** Established platforms in the online booking space may pose significant competition in terms of pricing, features, or brand trust.
2. **Data Security Risks:** As the platform handles sensitive user data, it could be a target for cyber threats, requiring robust security measures.
3. **Regulatory Challenges:** Ensuring compliance with local housing and data protection regulations may be complex and time-consuming.
4. **Changing User Preferences:** A shift in user needs or preferences could render the current features less appealing.



# UML Diagram



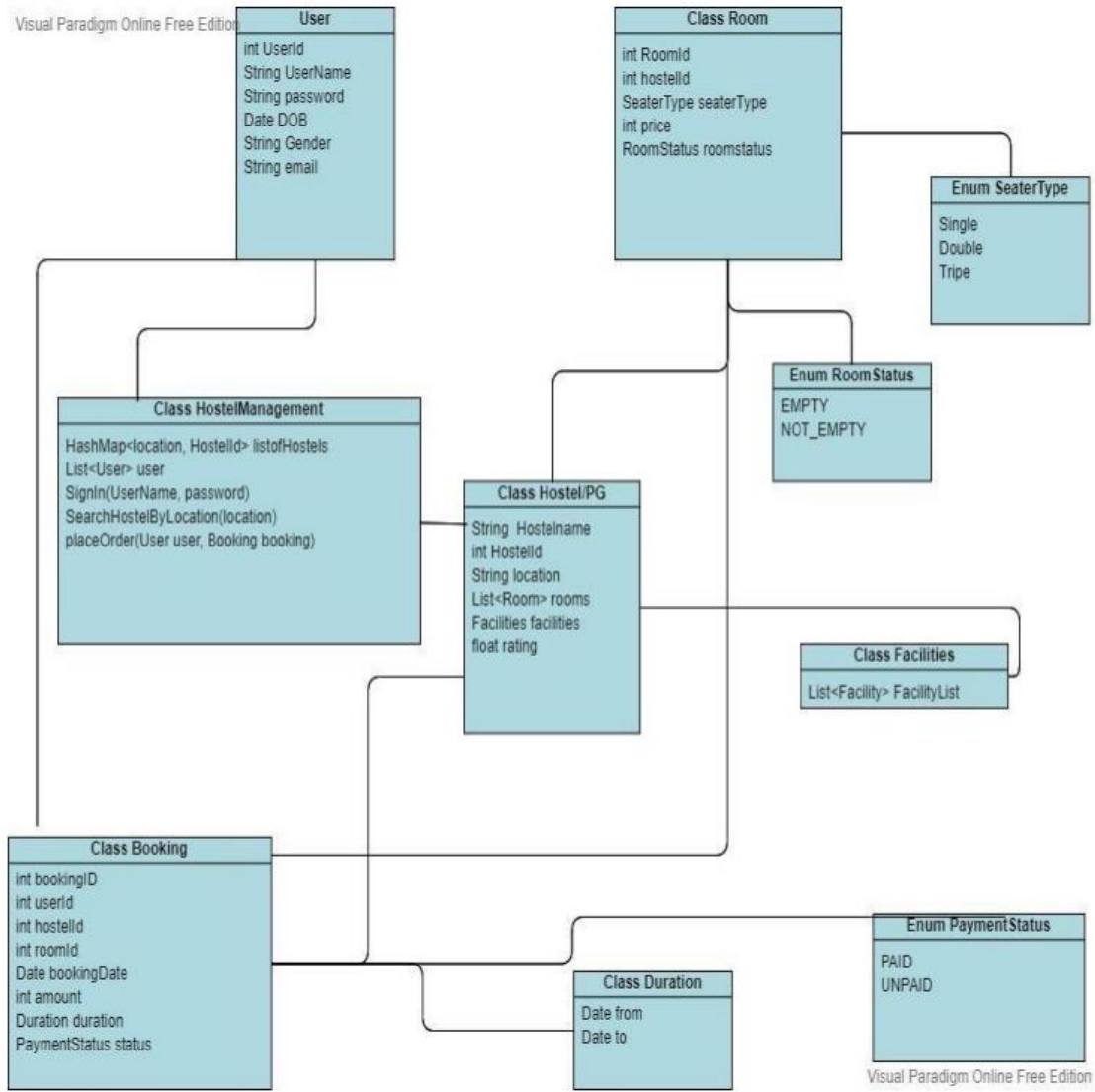


Fig 4. Class diagram

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