



**K.RAMAKRISHNAN
COLLEGE OF TECHNOLOGY**

An Autonomous Institution

Affiliated to Anna University Chennai, Approved by AICTE New Delhi,
ISO 9001:2015 & ISO 14001:2015 Certified Institution, Accredited with 'A+' grade by NAAC

Samayapuram, Tiruchirappalli – 621 112, Tamilnadu, India.



A Project Report

on

HOTEL MANAGEMENT SYSTEM

Submitted in partial fulfillment of requirements for the award of the course

of

EGB1201 – JAVA PROGRAMMING

Under the guidance of

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Assistant Professor / Information Technology

Submitted By

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DEPARTMENT OF ELECTRONICS AND COMMUNICATION ENGINEERING

K. RAMAKRISHNAN COLLEGE OF TECHNOLOGY
(Autonomous)

TRICHY - 621112

DECEMBER 2024



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(Autonomous Institution affiliated to Anna University, Chennai)

TRICHY - 621112

BONAFIDE CERTIFICATE

Certified that this project report on “**HOTEL MANAGEMENT SYSTEM**” is the Bonafide work of **THOMAS LIVINGSTON G (2303811710621115)** who carried out the project work during the academic year 2024 - 2025 under my supervision.

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INTERNAL EXAMINER

EXTERNAL EXAMINER



DEPARTMENT OF ELECTRONICS AND COMMUNICATION ENGINEERING

VISION OF THE INSTITUTION

To emerge as a leader among the top institutions in the field of technical education

MISSION OF THE INSTITUTION

- Produce smart technocrats with empirical knowledge who can surmount the global challenges
- Create a diverse, fully-engaged, learner-centric campus environment to provide quality education to the students
- Maintain mutually beneficial partnerships with our alumni, industry, and Professional associations

VISION OF THE DEPARTMENT

To create innovative and socially responsible Electronics and Communication Engineers with design skills and research focus to meet Societal and Industrial needs.

MISSION OF THE DEPARTMENT

- M1: To provide high quality education and professional ethics to students through enhanced learning environment
- M2: To impart a creative environment towards centre of excellence in department with design skill and exposure for research.
- M3: To nurture required employable skills of students to satisfy the industry and social needs with ethical and human values.

PROGRAM EDUCATIONAL OBJECTIVES (PEOS)

- PEO1: Core Knowledge Development: Graduates will have enhanced engineering skills in the field of electronics, communication and interdisciplinary areas to serve the society with global standards.



- PEO2: Professional development: Graduates will apply the technical knowledge for continuous up gradation of their professional skills to become an inimitable employee, researcher or entrepreneur.
- PEO3: Analytical Thinking: Graduates will have analytic and thinking skills to provide the innovative solutions for industry and societal requirements.

PROGRAM OUTCOMES

Engineering students will be able to:

1. **Engineering knowledge:** Apply the knowledge of mathematics, science, engineering fundamentals, and an engineering specialization to the solution of complex engineering problems.
2. **Problem analysis:** Identify, formulate, review research literature, and analyze complex engineering problems reaching substantiated conclusions using first principles of mathematics, natural sciences, and engineering sciences.
3. **Design/development of solutions:** Design solutions for complex engineering problems and design system components or processes that meet the specified needs with appropriate consideration for the public health and safety, and the cultural, societal, and environmental considerations.
4. **Conduct investigations of complex problems:** Use research-based knowledge and research methods including design of experiments, analysis and interpretation of data, and synthesis of the information to provide valid conclusions.
5. **Modern tool usage:** Create, select, and apply appropriate techniques, resources, and modern engineering and IT tools including prediction and modelling to complex engineering activities with an understanding of the limitations.
6. **The engineer and society:** Apply reasoning informed by the contextual knowledge to assess societal, health, safety, legal and cultural issues and the consequent responsibilities relevant to the professional engineering practice.



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7. **Environment and sustainability:** Understand the impact of the professional engineering solutions in societal and environmental contexts, and demonstrate the knowledge of, and need for sustainable development.
8. **Ethics:** Apply ethical principles and commit to professional ethics and responsibilities and norms of the engineering practice.
9. **Individual and team work:** Function effectively as an individual, and as a member or leader in diverse teams, and in multidisciplinary settings.
10. **Communication:** Communicate effectively on complex engineering activities with the engineering community and with society at large, such as, being able to comprehend and write effective reports and design documentation, make effective presentations, and give and receive clear instructions.
11. **Project management and finance:** Demonstrate knowledge and understanding of the engineering and management principles and apply these to one's own work, as a member and leader in a team, to manage projects and in multidisciplinary environments.
12. **Life-long learning:** Recognize the need for, and have the preparation and ability to engage in independent and life-long learning in the broadest context of technological change.

PROGRAM SPECIFIC OUTCOMES (PSOs)

- PSO1: To analyse, design and develop solutions by applying foundational concepts of electronics and communication engineering.
- PSO2: To apply design principles and best practices for developing quality products for scientific and business applications.



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ABSTRACT

The Hotel Management System with Billing and Payment is a Java-based application designed to simplify and automate hotel operations, including room booking, billing, payment processing, and activity logging. Built with the Swing framework, it provides an intuitive interface for efficient user interaction. The system allows hotel staff to manage bookings by recording room details, customer information, and pricing, while the billing module calculates charges based on the duration of stay and generates detailed bills. Secure payment handling is implemented, allowing customers to process transactions easily. Key features include robust error handling to validate user inputs and an activity logging system to maintain records of all transactions. Utilizing Java concepts such as event-driven programming, GUI design, and data storage with HashMap, the system offers reliability and ease of use, making it a practical solution for small to medium-sized hotels.



ABSTRACT WITH POs AND PSOs MAPPING

ABSTRACT	POs MAPPED	PSOs MAPPED
The Hotel Management System with Billing and Payment is a Java-based application designed to simplify and automate hotel operations, including room booking, billing, payment processing, and activity logging. Built with the Swing framework, it provides an intuitive interface for efficient user interaction. The system allows hotel staff to manage bookings by recording room details, customer information, and pricing, while the billing module calculates charges based on the duration of stay and generates detailed bills. Secure payment handling is implemented, allowing customers to process transactions easily. Key features include robust error handling to validate user inputs and an activity logging system to maintain records of all transactions. Utilizing Java concepts such as event-driven programming, GUI design, and data storage with HashMap, the system offers reliability and ease of use, making it a practical solution for small to medium-sized hotels.	PO 1 PO 2 PO 3 PO 4 PO 5	PSO 1 PSO 2

Note: 1- Low, 2-Medium, 3- High

SUPERVISOR

HEAD OF THE DEPARTMENT



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CHAPTER 1

INTRODUCTION

Managing hotel operations efficiently is critical to ensuring customer satisfaction and optimizing resources. Traditional methods of handling bookings, billing, and payments often involve significant manual effort, leading to errors and delays. To address these challenges, the Hotel Management System with Billing and Payment offers a digital solution designed to automate and streamline these processes. Developed using Java, the system leverages a user-friendly graphical interface to allow hotel staff to manage bookings, calculate bills, and process secure payments effortlessly. With features like error handling, real-time feedback, and activity logging, the system aims to provide a seamless experience for both staff and customers while improving overall operational efficiency.

1.1 Objective

The primary objective of the Hotel Management System with Billing and Payment is to streamline hotel operations by automating essential processes like room booking, billing, and payment. The specific objectives include:

1. **Efficient Room Management:** Simplify the process of room allocation, customer data storage, and booking tracking through a centralized system.
2. **Accurate Billing and Secure Payment:** Automate bill generation based on the stay duration and provide secure, reliable payment handling for customers.
3. **Enhanced Transparency and Reliability:** Ensure operational accuracy with features like error validation, real-time feedback, and activity logging to improve efficiency and customer satisfaction.



1.2 Overview

The Hotel Management System with Billing and Payment is a versatile application designed to streamline hotel operations by integrating room booking, billing, and payment functionalities into a single, user-friendly interface. Developed using Java and its Swing library for graphical user interfaces, the system allows hotel staff to efficiently manage bookings, calculate bills based on the duration of stay, and process secure payments. It incorporates features like error handling for input validation, real-time user feedback, and activity logging to enhance transparency and reliability. By utilizing efficient data structures such as HashMap for storing room and customer data, the system ensures high performance, scalability, and adaptability, making it a practical solution for small- to medium-sized hotels.

1.3 Java Programming Concepts

Object-Oriented Programming (OOP):

Core principles like encapsulation, inheritance, and polymorphism are utilized to structure the system into logical components for modularity and scalability.

Swing for GUI Development:

Java Swing is used to create an interactive and user-friendly graphical user interface, allowing users to manage bookings, billing, and payments seamlessly.

Event-Driven Programming:

Event listeners and handlers, such as ActionListener, are implemented to manage user interactions like button clicks and form submissions.

Collections Framework:

HashMap is employed for efficient data storage and retrieval, managing room prices, customer information, and bookings.

Handling:

try-catch blocks are used to handle runtime errors, such as invalid inputs, ensuring the



system runs smoothly without crashing.

Input/Output Operations:

The system supports data entry and log outputs using text fields and areas, along with prompts like JOptionPane for user inputs.

String Manipulation:

String methods are used to format and validate user inputs, such as ensuring valid credit card numbers and names.

Dynamic Data Validation:

User inputs are validated dynamically to check for empty fields or incorrect formats, preventing errors and maintaining data integrity.

Multi-threading (if extended):

The system can incorporate multi-threading to handle background tasks like payment processing or logging without interrupting the GUI.



CHAPTER 2

PROJECT METHODOLOGY

2.1 Proposed Work

The proposed Hotel Management System aims to streamline hotel operations by providing a unified platform for managing room bookings, generating billing statements, and processing payments securely. Developed in Java, the system will leverage Swing for a user-friendly graphical interface and implement modular functionalities for booking management, error handling, and activity logging. This solution will ensure efficient data handling through in-memory structures like HashMap, enhancing responsiveness and ease of use for hotel staff. By integrating secure payment processing and comprehensive logging, the system will provide transparency, reliability, and a better experience for both staff and customers.

2.2 Block Diagram

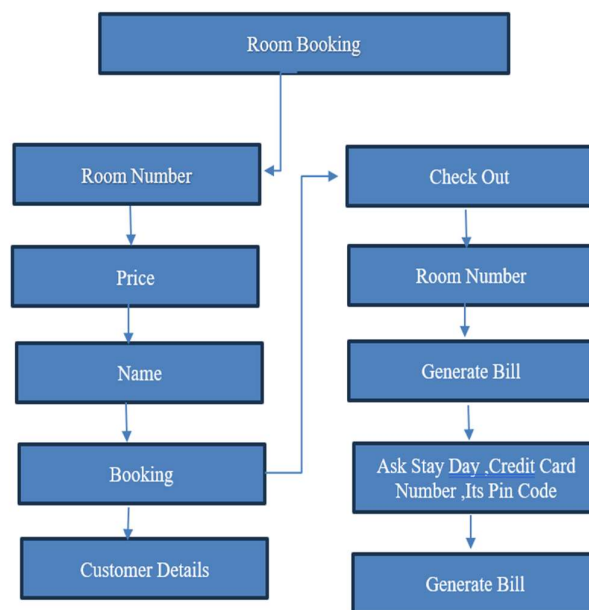


Figure 2.1 Hotel Management System



CHAPTER 3

MODULE DESCRIPTION

3.1 Main Module

Description: The main module serves as the entry point of the application, initializing the user interface and launching the system. It ensures the proper initialization of all components using the `SwingUtilities.invokeLater` method for thread safety.

3.2 Room Booking Module

Description: This module is responsible for handling the room booking process. It captures room details (room number, price, customer name) from user input, validates the data, stores the booking information in `HashMap`, and logs booking activities for reference.

3.3 Billing and Check-Out Module

Description: The billing module manages the check-out process. It calculates the total bill based on the number of days stayed, processes payments, and logs billing activities. It also ensures that rooms are removed from bookings after a successful payment and check-out.

3.4 Error Handling and Validation Module

Description: Responsible for ensuring that all user inputs are valid before processing. It checks for empty fields, invalid data formats, and displays relevant error messages through `JOptionPane` dialogs to ensure the application runs smoothly.



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3.5 Data Management Module

Description: This module handles the storage and management of room bookings and pricing information. Using HashMap, it efficiently stores and retrieves room details and customer names, ensuring data integrity and fast access during booking and check-out.

3.6 Logging Module

Description: The logging module records all room booking and billing activities, providing an audit trail for the system. It logs the booking details and payment information in text areas, ensuring transparency and accountability..



CHAPTER 4

RESULTS AND DISCUSSION

Figure 4.1 Hotel Management System

The Hotel Management System with Billing and Payment provides interactive and precise outputs to ensure smooth hotel operations. It confirms bookings with detailed logs, including room numbers, customer names, and prices, while displaying error messages for invalid inputs to guide users. During check-out, it calculates the total bill based on the stay duration and presents a clear summary. Payment validation ensures secure transactions with masked card details, and success or error prompts provide immediate feedback. Additionally, all actions are recorded in activity logs, enhancing transparency, accuracy, and traceability for both staff and customers.

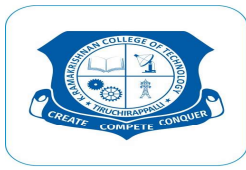


CHAPTER 5

CONCLUSION

The Hotel Management System with Billing and Payment successfully integrates core Java concepts, such as object-oriented programming, GUI development with Swing, and efficient data management, to create a functional and user-friendly application. By organizing the system into well-defined modules—such as room booking, billing, and error handling—it ensures a clear structure and easy maintainability. The system allows hotel staff to efficiently manage room bookings, process check-outs, and generate billing statements while providing secure payment handling.

Through this project, various programming concepts, including event-driven programming, data validation, and the use of collections like HashMap, are applied to solve real-world challenges in hotel management. Overall, the application demonstrates the effectiveness of Java in building practical solutions that are both scalable and user-friendly. Further enhancements, such as adding a database for persistent storage or integrating more sophisticated payment systems, could be considered for future versions to make the system even more robust and efficient.



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REFERENCES

"Java: The Complete Reference" by Herbert Schildt-book

Why Use It?: Comprehensive resource for all Java topics, including GUI development with Swing. Publisher: McGraw-Hill Education.

Java Swing Tutorial - GeeksforGeeks-website

Why Use It?: Provides step-by-step tutorials and code examples for using Swing in Java. Oracle Java Documentation.

Why Use It?: Official documentation for Swing components and Java UI programming.

Youtube channels: error makes clever, code.io



APPENDIX (Coding)

```
import javax.swing.*;
import java.awt.*;
import java.awt.event.*;
import java.util.HashMap;

class HotelManagementSystemWithPayment extends JFrame {

    // Data storage
    private HashMap<String, Double> roomPrices = new HashMap<>(); // Room price storage
    private HashMap<String, String> bookings = new HashMap<>(); // Room to customer
    mapping

    // Constructor
    public HotelManagementSystemWithPayment() {
        // Frame setup
        setTitle("Hotel Management System with Billing & Payment");
        setSize(700, 500);
        setDefaultCloseOperation(EXIT_ON_CLOSE);
        setLayout(new BorderLayout());

        // Title
        JLabel titleLabel = new JLabel("Hotel Management System with Billing & Payment",
JLabel.CENTER);
        titleLabel.setFont(new Font("Arial", Font.BOLD, 20));
        add(titleLabel, BorderLayout.NORTH);
```



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// Tabs

```
JTabbedPane tabs = new JTabbedPane();
```

// Room Booking Tab

```
JPanel bookingPanel = new JPanel(new GridLayout(5, 2, 10, 10));
```

```
bookingPanel.setBorder(BorderFactory.createEmptyBorder(10, 10, 10, 10));
```

```
JLabel roomNumberLabel = new JLabel("Room Number:");
```

```
JTextField roomNumberField = new JTextField();
```

```
JLabel roomPriceLabel = new JLabel("Room Price (per day):");
```

```
JTextField roomPriceField = new JTextField();
```

```
JLabel customerNameLabel = new JLabel("Customer Name:");
```

```
JTextField customerNameField = new JTextField();
```

```
JButton bookButton = new JButton("Book Room");
```

```
JTextArea bookingLog = new JTextArea(5, 20);
```

```
bookingLog.setEditable(false);
```

```
bookingPanel.add(roomNumberLabel);
```

```
bookingPanel.add(roomNumberField);
```

```
bookingPanel.add(roomPriceLabel);
```

```
bookingPanel.add(roomPriceField);
```

```
bookingPanel.add(customerNameLabel);
```

```
bookingPanel.add(customerNameField);
```

```
bookingPanel.add(new JLabel());
```

```
bookingPanel.add(bookButton);
```

```
bookingPanel.add(new JLabel("Booking Log:"));
```

```
bookingPanel.add(new JScrollPane(bookingLog));
```

```
tabs.add("Room Booking", bookingPanel);
```

// Check-Out and Billing Tab



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```
JPanel billingPanel = new JPanel(new GridLayout(5, 2, 10, 10));
billingPanel.setBorder(BorderFactory.createEmptyBorder(10, 10, 10, 10));

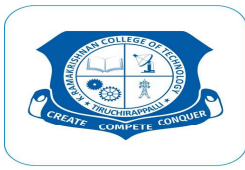
JLabel billingRoomLabel = new JLabel("Room Number:");
JTextField billingRoomField = new JTextField();
JButton checkOutButton = new JButton("Check-Out & Generate Bill");
JTextArea billingLog = new JTextArea(5, 20);
billingLog.setEditable(false);

billingPanel.add(billingRoomLabel);
billingPanel.add(billingRoomField);
billingPanel.add(new JLabel());
billingPanel.add(checkOutButton);
billingPanel.add(new JLabel("Billing Log:"));
billingPanel.add(new JScrollPane(billingLog));

tabs.add("Billing", billingPanel);

add(tabs, BorderLayout.CENTER);

// Button Listeners
bookButton.addActionListener(e -> {
    String room = roomNumberField.getText();
    String customer = customerNameField.getText();
    String priceText = roomPriceField.getText();
    if (!room.isEmpty() && !customer.isEmpty() && !priceText.isEmpty()) {
        try {
            double price = Double.parseDouble(priceText);
            roomPrices.put(room, price);
            bookings.put(room, customer);
            bookingLog.append("Room " + room + " booked by " + customer + " at $" + price
```



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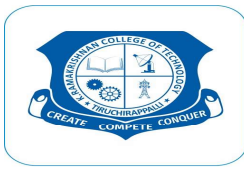
```
+ " per day.\n");

roomNumberField.setText("");
customerNameField.setText("");
roomPriceField.setText("");
} catch (NumberFormatException ex) {
    JOptionPane.showMessageDialog(this, "Invalid price entered!", "Error",
JOptionPane.ERROR_MESSAGE);
}
} else {
    JOptionPane.showMessageDialog(this, "Please fill all fields!", "Error",
JOptionPane.ERROR_MESSAGE);
}
});

checkoutButton.addActionListener(e -> {
    String room = billingRoomField.getText();
    if (bookings.containsKey(room)) {
        String customer = bookings.get(room);
        double roomPrice = roomPrices.get(room);

        // Ask the number of days stayed
        String daysStayedText = JOptionPane.showInputDialog(this, "Enter the number of
days stayed:");
        if (daysStayedText != null && !daysStayedText.isEmpty()) {
            try {
                int daysStayed = Integer.parseInt(daysStayedText);
                double totalBill = roomPrice * daysStayed;

                // Ask for payment details
                String creditCardNumber = JOptionPane.showInputDialog(this, "Enter Credit
Card Number:");
```



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```
String password = JOptionPane.showInputDialog(this, "Enter Credit Card  
Password:");
```

```
        if (creditCardNumber != null && password != null &&  
!creditCardNumber.isEmpty() && !password.isEmpty()) {  
            billingLog.append("Room " + room + " checked out. Bill for " + customer +  
": $" + totalBill + "\n");  
            billingLog.append("Payment successful for " + customer + " using card  
ending in " + creditCardNumber.substring(creditCardNumber.length() - 4) + "\n");  
  
            // Remove room from bookings  
            bookings.remove(room);  
            roomPrices.remove(room);  
        } else {  
            JOptionPane.showMessageDialog(this, "Payment failed. Please enter valid  
payment details!", "Error", JOptionPane.ERROR_MESSAGE);  
        }  
    } catch (NumberFormatException ex) {  
        JOptionPane.showMessageDialog(this, "Invalid number of days entered!",  
"Error", JOptionPane.ERROR_MESSAGE);  
    }  
}  
}  
} else {  
    JOptionPane.showMessageDialog(this, "Room not found or not booked!", "Error",  
JOptionPane.ERROR_MESSAGE);  
}  
    billingRoomField.setText("");  
});  
}  
  
public static void main(String[] args) {
```



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```
SwingUtilities.invokeLater(() -> {  
    HotelManagementSystemWithPayment hms = new  
    HotelManagementSystemWithPayment();  
    hms.setVisible(true);  
});  
}  
}
```