**Project Proposal: Hotel Management System**

**Introduction:**

We propose the development of an Object-Oriented Hotel Management System in C++, designed to provide an efficient and comprehensive solution for managing hotel operations and resources. This project will incorporate various object-oriented programming concepts, such as classes, inheritance, polymorphism, encapsulation, dynamic memory allocation, file handling, and exception handling.

**Project Overview:**

The Hotel Management System will serve as a centralized platform for hotel staff to manage room bookings, guest information, billing, and other administrative tasks. It will offer functionalities such as room management, guest registration, booking and check-out processes, payment processing, reporting, and administrative privileges. The project will emphasize modular design, extensibility, and code reusability to support future enhancements and maintenance.

**Key Features:**

1. **Room Management:**
   * Develop classes to represent rooms with attributes like room number, type, status, and price.
   * Enable hotel staff to add, update, delete, and search room records in the hotel database.
2. **Guest Management:**
   * Create classes to manage guest information, including name, contact details, and booking history.
   * Allow staff to register new guests, update guest information, and view guest records.
3. **Booking and Check-Out Processes:**
   * Implement mechanisms for booking rooms, checking availability, and handling reservations.
   * Facilitate check-out processes, updating room status and generating billing statements.
4. **Payment Processing:**
   * Incorporate logic for processing payments, including calculating total charges, applying discounts, and generating receipts.
   * Provide options for various payment methods and manage payment records.
5. **Reporting:**
   * Generate reports on room occupancy, revenue, guest statistics, and other key metrics.
   * Enable staff to view and analyze these reports to make informed decisions.
6. **Administrative Privileges:**
   * Define user roles and permissions to differentiate between front desk, management, and administrative tasks.
   * Implement secure login mechanisms and access controls to restrict unauthorized actions.
7. **Data Persistence:**
   * Utilize file handling to store and retrieve hotel data, ensuring data integrity and consistency.
   * Implement error handling and recovery mechanisms to manage potential file I/O errors.
8. **User Interface:**
   * Develop a user-friendly command-line interface or graphical interface for interacting with the hotel management system.
   * Focus on usability and intuitiveness to facilitate efficient navigation and task execution for all users.

**Conclusion:**

The Object-Oriented Hotel Management System project provides a robust platform for students to apply and consolidate their understanding of object-oriented programming concepts in C++. By designing and implementing a comprehensive system for managing hotel operations, students will gain practical experience in software design, development, and testing. This project not only reinforces core programming skills but also enhances problem-solving abilities and fosters an appreciation for modular and extensible software architectures.