

OOPS with C++ LAB (PCS307)

Practice Programs

1. Write a C++ program to find the largest among three numbers entered by the user using nested if-else statements.
2. Create a C++ program to print Fibonacci series up to n terms using a while loop. Take user input for the number of terms to be displayed.
3. Implement a C++ program to calculate the number of days in a month using a switch statement. Take user input for the month number and year.
4. An array stores details of 25 students (rollno, name, marks in three subject). Write a program to create such an array and print out a list of students who have failed in more than one subject (**Structure**).
5. Write a function that receives two numbers as an argument and display all prime numbers between these two numbers. Call this function from main ().
6. Write a C++ program to find the maximum and minimum elements in an array using functions. Define separate functions named findMax and findMin that take an array of integers and its size as parameters and return the maximum and minimum elements respectively. Display the maximum and minimum elements in an array entered by the user.
7. Write a C++ program that removes all duplicate characters from a given string, preserving the first occurrence of each character.
Input: engineering
Output: engir
8. Write a C++ program that accepts a word from the user and checks whether it is a palindrome using a function. Display appropriate messages.
Input: madam
Output: The string is a palindrome.
9. The local library charges a fine based on the number of days a book is returned late. Create a C++ program that uses a class LibraryUser to store the user's name, book name, and number of late days.
The fine is structured as follows:
 - First 5 days: Rs. 2 per day
 - Next 5 days: Rs. 5 per day
 - Beyond 10 days: Rs. 10 per day.Include a method to calculate and display the fine based on the rules above.
10. Create a C++ program to create a class Employee with the following specifications:
Private members: name, employee ID, salary
Public methods:
 - setData() to set the values
 - getSalaryAfterTax() to return salary after deducting 10% tax
 - displayData() to display all employee details.
11. Create a class FlightBooking to manage ticket booking with fare calculation. Use the following rules:

- Fare rate: Economy – Rs. 5/km, Business – Rs. 10/km
- Data members: passenger name, seat type, distance (in km), fare
- Public methods:
- bookTicket() to enter the details
 - calculateFare() to compute fare based on seat type
 - displayTicket() to show booking and fare details
12. Create a class Grade with an array to store marks of 6 subjects.
Input student name and 6 marks and Calculate the average and assign grades:
 - A if average ≥ 90
 - B if average 80–89
 - C if average 70–79
 - D if average < 70
 Display student name, average, and assigned grade using function.
 13. Write a C++ program that implements function overloading to read matrices of different data types such as floating-point numbers and integers
 14. Calculate the area and circumference of class circle using scope resolution operator by declaring two constructors (Default and Parameterized) within the class.
 15. Write a C++ program for function overloading using different number of parameters.
 16. Write a C++ program to create a class Area with three overloaded constructors that calculate area for Square, Rectangle and Triangle. Display area using a member function.
 17. Write a C++ program to Create a class Person with data members as name, age and city. Implement a default constructor that sets all values to default ("Unknown", 0, "Not Set") And a parameterized constructor that accepts user-defined values. Write a method showDetails() to display person information.
 18. Write a C++ program for multiplying two matrix using operator overloading.
 19. Write a C++ program in C++ to add members of two different classes using friend function.
 20. Write a C++ program that implements an Order class that stores product price and quantity. Another class Coupon, stores discount percent. Write a common friend function to calculate the final bill after applying the coupon on the total order amount. Add an extra condition: If the coupon reduces the bill by more than ₹2000, it should cap the discount at ₹2000.
 21. A hospital wants to store details of patients. Each patient has: patientID, name, disease, daysAdmitted.
 - Create a parameterized constructor for initialization.
 - Create an array of 5 patients.
 - Write a function to calculate and display the bill (₹1000 per day).
 - Display the patient who has the highest bill.
 22. A cinema hall wants to keep ticket booking details. Each ticket has: ticketID, movieName, seatNo, price.
 - Initialize using parameterised constructor.
 - Create an array of 6 tickets.
 - Write a function to calculate total revenue collected.

- Display tickets booked for a specific movie.
23. An e-commerce system stores order details: orderID, itemName, quantity, price.
- Create an order using constructor.
 - Use a copy constructor to duplicate the order for a replacement case.
 - Change the orderID in the new order but keep the other details the same.
 - Display both orders.
24. Write a C++ program with two classes: BankAccount (private members: accountNumber, balance) and Transaction (friend class of BankAccount).
The Transaction class should perform:
- Deposit money into the account.
 - Withdraw money (if sufficient balance exists).
 - Display final balance
25. Create a class Complex to represent complex numbers. Overload the + and - operators using friend function.