Birla Vishvakarma Mahavidyalaya Engineering College

(An Autonomous Institution)

Computer Engineering Department

201CP: Object Oriented Programming with C++

AY: 2025 -26 Sem I

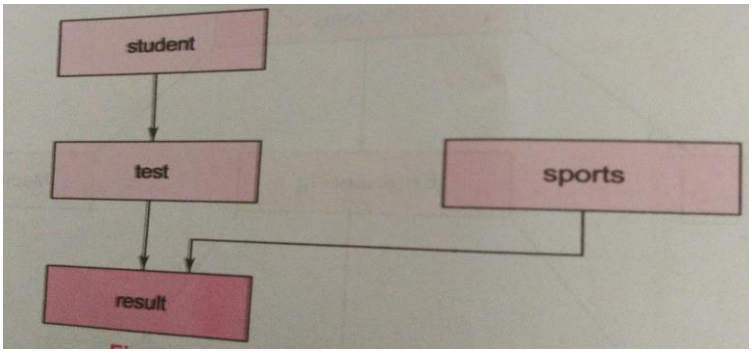
List of Experiments

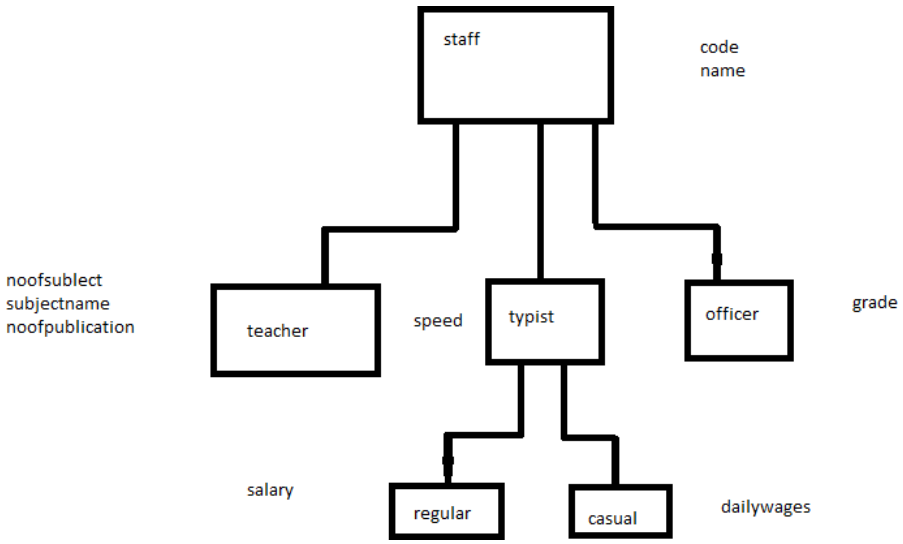
Sr. No.	Title of the Program
1.	Write a C program to insert given element at given position in an Array using function.
2.	Write a C program to delete an element from the given position of an Array.
3.	Write a C program that calls a user defined function findmax to find maximum number and its position from the given array.
4.	Define a Structure named distance with two integer members feet and inches. Implement a user defined function named addDistance() that will take two structure variables as arguments and return structure which consists of addition of their elements. (Hint: 1 feet = 12 inches. If first distance is 10 feet 8 inches, second distance in 5 feet 7 inches then total distance should be 16 feet 3 inches.)
5.	Define a structure called cricket that will describe the following information: • Player name • Team name • Batting average Write a C program that read N player information. Use Dynamic memory allocation. Write a function to find player name and team name who has maximum batting average.
6.	Assume two arrays, one of the student records and the other of employee records. Each student record contains member for a last name, a first name and a grade point index. Each employee record contains members for a last name, a first name and a salary. Both arrays are ordered in alphabetical order by last name and first name. Write a C function to give a 10% raise to every employee who has a student record and whose grade point index is greater than 3.0. Also write necessary functions to initialize and print the information of N employee and student records.
7.	Write a C++ program to find factorial of a number.
8.	Write C++ program to accept product id, quantity and price of product. Calculate total amount and display all the details.
9.	Write C++ program to create class Bank having data members like account no and balance. Write functions for initializations, withdraw, deposit and display.
10.	Declare array as member of class number. Write functions to initialize, display, finding max value, min value and sorting of elements.
11.	Write a C++ program to create a class Bank with account no, customer name, type of account and balance as its attributes. Implement the methods withdraw() (amount can be withdrawn after checking condition), deposit() and showBalance(). Write constructor for initialization. Create an array of objects of class Bank in main and call different functions.

12.	Create a class to represent a vector. Include member functions to perform the following tasks: • To initialize the vector • To modify the value of a given element • To multiply by a scalar value • Add two vector • Display Write main program which calls appropriate member functions to perform above tasks.
13.	A book shop maintains the inventory of books that are being sold at the shop. The list includes details such as author, title, price, publisher and stock. Define following member functions: • To assign initial values using parameterized constructors • To search book of given author and title • To buy no of copies of book of specified author and title after checking stock • To display book information. Design a system using a class called book with above members. Create an array of objects in main and show usage of above functions. Use new operator in constructor to allocate memory space required and write destructor.
14.	Define class matrix having following functions: • Constructor • find_max which find max value and position (row and column) • Display • matrixmul which multiply two matrices. Use dynamic memory allocation for data member. Also write destructor.
15.	Declare class string in which one data member is pointer pointing to array of characters and second data member is length. Use constructor for initialization. Write member functions for performing concatenation of two strings. Also write destructor.
16.	Define a class to represent a bank account. Declare Name of the depositor, account number, type of account and balance as the data members. Define follwing member functions: • To assign initial values • To deposit an amount • To withdraw an amount after checking the balance • To display name and balance. Also print those customers whose balance is less than 1000. Create an array of objects in main and show usage of above functions. Account number should be set automatically like 1, 2,3,…. as objects gets created.
17.	Declare class string in which one data member is pointer pointing to array of characters and second data member is length. Use constructor for initialization. Write member function to find occurrences of substring in given string and replace all occurrences with another substring. Also write destructor. Use copy constructor. Create a function called reverse() that takes two parameters. The first parameter, called str is a pointer to a string that will be reversed upon return from the function. The second parameter is called count and specify how many characters of str to reverse. When count is not specified, function should reverse entire string.
18.	Create class DB which store the values of distance in feet and inches. Write a program that can read values for the class objects and add one object with another object. It also

	add constant value to distance object. Use overloaded functions to carry out the addition operation. The display should be in the format of feet and inches.

19.	Declare class string in which one data member is pointer pointing to array of characters and second data member is length. Use constructor for initialization. Write member functions for performing following operations:
	• s3 = s1 + s2 (Concatenate two strings by overloading + operator. Use call by value parameter passing)
	• s4=s1+4; // it skip first 4 character and copy remaining characters
	• s6=s5 // overload = operator
	Check whether copy constructor is required or not. If so, define it.

20.	Declare a class called animal having private data members name and speed. Define following functions: • Default constructor for reading data members form keyboard Overloaded constructor with two arguments • Display function • Overload operator <= to compare speed of two animal objects • Overload operator ++ to increment speed of animal object (postfix and prefix) Define main to illustrate use of above functions.
21.	Define class time with data members like hour, minute and second. Write constructor for initialization and implement display function. Overload operator + and ++ using friend function for following operations: • T3 = T1 + T2 • T4 = 2 + T3 • T5 = T2++ • T6 = ++ T2 Define main to illustrate use of above functions.
22.	Write a program to find maximum of two numbers using friend function where both the numbers are members of two different classes.
23.	Consider Bank as base class and saving as derived class. Bank class has data members like name and account no. Saving class has data member as balance. Define appropriate functions to initialize and display the information.
24.	Write a c++ program to illustrate Hybrid inheritance as shown below.  Consider student name and id as data members of class student. Consider no of subjects, name, credit and grade as data members of class test. Consider no of sports, name and point earned as data members of class sports. Result is sum of spi and total points earned. Write appropriate functions to initialize and display the information.
25.	Declare a base class called college having data members like college name and type to represent college. Derive a class called department having data members like dept_name

	and no_of_faculty. Define necessary functions. Define main in which create an array of objects of type department and print information of college and department having no_of_faculty greater than 15.
26.	Specify all classes as shown in figure. Define functions to create the databases and retrieves individual information as an when required. 
27.	Declare a base class shape and three derived classes called rectangle, square and triangle. Show use of dynamic polymorphism for these classes by overriding function display_area(). Define constructor for all classes.
28.	Assume that a bank maintains two kinds of accounts for customers, one called as savings and the other as current. The savings account provides compound interest and withdrawal facilities but no cheque book facility. The current account provides cheque book facility but no interest. Current account holders should also maintain a minimum balance and if the balance falls below this level a service charge is imposed. Create a class account that stores customer name, account number and type of account. Derive the classes, cur_acct and sav_acct to make them more specific to their requirement. Include necessary functions in order to achieve the following tasks: • Accept deposit from a customer and update the balance • Display the balance • Compute and deposit interest • Permit withdrawal after checking balance and update the balance • Check for minimum balance. Raise & handle exception if not maintained, impose penalty and update the balance Use constructors for initialization and main function to show usage of above functions. Also demonstrate dynamic polymorphism.
29.	Write a complete program to calculate largest of integer numbers given by user falling in the range of limit1 and limit2. The program should read N, limit1, limit2 and N integer numbers. If any number entered by user is not within the range, raise and handle exception to discard it. Use it otherwise for computing the largest. Display the largest number.
30.	Declare a generic class called matrix_class using template having generic member to store 3x3 two dimensional matrix. Define following functions: • Constructor • To perform matrix addition and to return resultant matrix • To count and return the occurrence of the smallest element of the matrix

	Define main to show usage of above functions.
31.	Different types of data produced by different sensors to be stored in an array called buffer. Declare a class using template having buffer as one of the data members. Include additional members as per the need. Define functions for Initialization, for finding minimum value, maximum value, average value form buffer (only one function is to be defined for finding all three) and for making –ve values to 0. Define main to show usage of above functions.
32.	Write a C++ Program to read and write student details using File Handling functions. Create class student with members like id, name and marks. Create array of objects and write in file. Read from file and display on screen.
33.	Write a C++ program to encrypt and decrypt file.
34.	Write a C++ program to create telephone directory which store name and phone number. Make menu driven program for • Add new customer • Update telephone number • Find telephone number from name • Display the information
35.	Write a program for a class called student having data members like s_name, s_id, s_sem and s_college. Overload extractor and insertor operators for this class.