

**Shri Ramdeobaba College of Engineering and Management, Nagpur**  
**Department of Computer Applications**  
**MCA Semester –I**  
**MCP542: Principles of Programming Language Lab**  
**Session 2023-24**

**List of Experiment**

- **Implementation of various Data Types. (CO1)**

1. Write a program in C / C++ to print Fibonacci series.
2. Write a program in C / C++ to print Reverse number.
3. Write a program in C / C++ for checking the Palindrome number.
4. Write a program in C / C++ to print Armstrong numbers between 1 to 10000.
5. Write a program in C / C++ to display Explicit Pascal Triangle (Right angle Shape).
6. Write a program in C / C++ to display Explicit Pascal Triangle (Equilateral Triangle Shape)
7. Write a program in C / C++ to display Implicit Pascal Triangle (Right angle Shape).
8. Write a program in C / C++ to display Implicit Pascal Triangle (Equilateral Triangle Shape)
9. Write a program in C / C++ to display Implicit Pascal Triangle (Right angle Shape with array).
10. Write a program in C / C++ to display Implicit Pascal Triangle (Equilateral Triangle Shape with array)
11. Write a program in C / C++ to perform Bubble sort.
12. Write a program in C / C++ to perform Selection sort.
13. Write a program in C / C++ for Linear search.
14. Write a program in C / C++ for Binary search.
15. Write a program in C / C++ to perform matrix multiplication.
16. Write a program in C / C++ to Sum of diagonal elements of Three matrices using 3D array.

- **Heap Management with various strategies. (CO2)**

17. Write a program in C / C++ for matrix addition using malloc().
18. Write a program in C / C++ for matrix addition using calloc().
19. Write a program in C / C++ for matrix multiplication using malloc().
20. Write a program in C / C++ for matrix multiplication using calloc().
21. Write a program in C/C++ for Pascal triangle using malloc() along with realloc ()
22. Write a program in C/C++ for Pascal right angle triangle using calloc()along with realloc ()

23. Write a program in C/C++ for First Fit Memory Allocation Algorithm.
24. Write a program in C/C++ for Best Fit Memory Allocation Algorithm.
25. Write a program using new and delete operators for adding the marks of all given subjects of a student.
26. Write a program using new and delete operators for calculating the total marks of all given subjects of each student, where number of students are 10.

- **Implementation of Function Calling, Exception Handling mechanism, Inheritance Mechanism and Access Specifiers. (CO3)**

27. Write a program for calculation percentage of student (Note: Enter 5 subject marks and use function with arguments and a return value)
28. Write a program in C to convert decimal number to binary number using the function. (Note: use function with arguments and a no return value).
29. Write a program to implement indirect recursion concept.
30. Write a C/C++ program to implement factorial of number using tail recursion concept. (Note: Take the input form user)
31. Write a C/C++ program to implement factorial of number using non tail recursion concept. (Note: Take the input form user)
32. Write a C/C++ program to implement Fibonacci series of number using tail recursion concept. (Note: Take the input form user)
33. Write a C/C++ program to implement Fibonacci series of number using non tail recursion concept. (Note: Take the input form user)
34. Write a Simple C/C++ program for Exception Handling Divide by zero
35. Write a Simple C/C++ Program for Exception Handling with Multiple Catch
36. Write a Simple C/C++ Program for Catch All or Default Exception Handling
37. Write a Simple C/C++ Program for Rethrowing Exception Handling in Function
38. Write a Simple C/C++ Program for Nested Exception Handling mechanism.
39. Write a program to create a class “Shopping” and write member functions to calculate billing amount of: Grocery items, Electronic gadgets, Clothes. Take inputs from the user.
40. Create a class car if the car model and milage of the car is given as input find the car model whose milage is highest and display both the car model and milage if the 7 enteries are given as input to the program use array of objects.
41. Write a C++ Program for addition of two complex numbers using parametrized constructor.

42. Write a C++ Program to Find the Area of shapes using function overloading.
43. Write a C++ Program to Create a class organization to initialize the details of the employee such as name, designation and salary components basic da and hra of the employee. Create a derived class calculate salary to calculate the total salary of the employee. If the base salary of the employee is greater than 25000 then bonus is 500 else bonus amount is 3000 the total salary is basic + DA + HRA + bonus. Display all the details of the employee for 5 employees
44. Write a C++ Program to demonstrate multilevel inheritance from organization class the employee class is derived by initializing the details from employee the salary class is derived to initialize the salary component of the employee and calculate the gross salary. By creating objects of the derived class display the details of 5 employees.

- **Control Flow in Looping Structures (CO3)**

45. Write a program to implement the concept of jump table.
46. Write a program to count number of vowels in a given word using switch statement.
47. Write a program to demonstrate the use of structure and nested structure
48. Write a program in demonstrate that how we can pass structures to a function.
49. Write a program to access the member of union data types.
50. Write a Program to demonstrate example of array of pointers.

### **Course Outcomes:**

On successful completion of the course, students will be able to:

- CO1. Describe different programming language paradigms and demonstrate their utility as well as enumerate different features present in modern programming languages.
- CO2. Design and implement algorithms for implementing different features of programming languages like dynamic memory Management.
- CO3. Analyze an application at hand, choose an appropriate programming language for it and design and develop the application for the chosen language.

**Date : 20/08/2023**

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