<u>Objective:</u> To write C programs for solving simple problems to understand Operators and Expressions, Control Structures, Arrays, Strings, Pointers, Functions, Recursion, Structures, Union and File Operations.

1. <u>Variable - Constant - Data-type - Keywords - Operators - Expressions</u>

- 1. Program to find area and circumference of circle.
- 2. Program to show swap of two no's without using third variable.
- 3. Input a character through keyboard and print its equivalent ASCII value.
- 4. Input an ASCII value through keyboard and print its equivalent character.
- 5. Display the size of various data-types in C.
- 6. Program to display first 10 natural numbers & their sum.
- 7. Program to print the multiplication table of any given number.
- 8. Program to shift input data by two bits to the left.
- 9. Program to calculate sum of 5 subjects & find percentage.
- 10. Program to find factorial of a number.
- 11. Compute GCD (HCF) and LCM of two numbers.
- 12. Program to convert temperature from degree centigrade to Fahrenheit.
- 13. Program to show the use of conditional operator.
- 14. Write a program that accept integer number and convert it into binary number and octal.
- binary number and octal.
 15. Write a program that accept integer number and convert it into Hexadecimal number.
- 16. Write a program to add two binary numbers

2. <u>Decision-making with Branch control statements (if, if...else, switch...case)</u>

- 1. To write a simple menu driven calculator program using Switch case statement.
- 2. Program to find that entered year is leap year or not.

 (Hint- A year (except century years) is a leap year, if it is divisible by 4.

 If it is a century year then it is a leap year if it is divisible by 400).
- 3. Determine age of a person in terms of years, months and days.
- 4. Check whether a given number is a palindrome or not.
- 5. Input three numbers and print the largest and smallest among them.
- 6. Program to print Fibonacci series up to 100.
- 7. Program to find whether given no is a prime no or not.
- 8. Input a letter through keyboard.

- a. If it is a lower case letter then convert it to an uppercase letter.
- b. If it is an upper case letter then convert it to a lower case letter.
- c. Otherwise, display an error message, by specifying its type: either a Digit or a Special symbol.

3. Repetition with Loop control statements (for, while, do...while)

- 1. Input an integer through keyboard and check whether it is palindrome.

 (Hint: First reverse the given integer and then compare both the numbers. If they match then the given integer is a palindrome. Example: 12321)
- 2. Display and Count all the prime numbers from 2 to 100.
- 3. Program to print stars Sequence1.

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4. Program to print star Sequences2.

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5. Print this triangle.

6. Program to display days in a week from Monday to Sunday. Use Switch case.

4. Arrays and Matrix

- 1. Program to show sum of 10 elements of array & show the average.
- 2. For a given number Search the array, If number found in the array then print its position in the array.
- 3. Program to find the maximum and minimum of an array
- 4. Sort an array of n elements both in ascending and descending order. Use Bubble Sort.

5. Merge two sorted arrays, and print the merged array.

Ex. Arra1: 384920

Array2: 1 2 15 20 27 35.

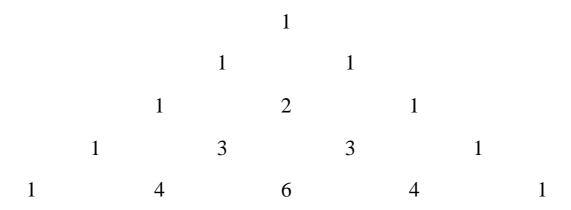
After merging Array1 and Array2 the resultant array contains following

Array3: 1 2 3 4 8 9 15 20 27 35.

- 6. Program to display 2D matrix.
- 7. Matrix operations (All)

Ex. Input Two Matrices A and B and Print the following.

- a. Addition A + B
- b. Subtraction A B
- c. Multiplication A X B
- d. Transpose of a matrix A^T
- e. Checking whether a square matrix is symmetric.
- f. Determinant of a matrix- Det (A) or |A|
- g. Inverse A⁻¹
- h. Diagonal Matrix
- i. Triangular Matrix (Upper and Lower)
- 8. Print the Pascal's Triangle



5. Character-Array and Strings

Write program for the following string manipulation without using library functions.

- 1. Compute the length of a string.
- 2. Copying one string to another.
- 3. Count the no. Of occurrences of a specified character in a given string.

Ex. Let us take the string ábacus'. No. In this string the character á' occurred 2 times.

4. Count and print all vowels in a given string.

Ex. Let us take the string abacus'. This string contains 3 vowels.

- 5. Concatenating two strings (Appending one string after another).
 - Ex. Str1 is "abc", str2 is "123". After concatenation str1 is "abc123".
- 6. Check whether a string is palindrome.
 - Ex. The string madam is a palindrome.
- 7. Convert an integer to string.
 - Ex. takes an integer 546. Its equivalent string is "546".
- 8. Comparing two strings.
 - Ex. Str1 is abc, str2 is cab. Output Str2 is greater than str1.

6. Function - Recursion - Pointer

- 1. Program to find largest of two numbers using functions.
- 2. Program to find factorial of a number using function.
- 3. Program to find square of a number using functions.
- 4. Program to swap two numbers using functions.
- 5. Program to find factorial of a number using recursion.
- 6. Program to show table of a number using functions.
- 7. Program to print the elements of an array using pointer.
- 8. Program to find the maximum number in array using pointer.
- 9. Program to reverse the elements of an array using pointer.
- 10. Program to show call by value.
- 11. Program to show call by reference.

7. <u>Structure and File Handling</u>

- 1. Define a structure called student having properties like student id, student name and branch of student.
- 2. Write a program which allows user to add new student, delete a student and also display all the students. Use array to store student's record.
- 3. Write a program to copy the content of one file to another file.
- 4. Write a program which takes 10 integer numbers from user. Save-all the positive numbers to one file, all the negative numbers to another file.
- 5. Write a program to merge the content of two different file into a single file.