**Course: Programming for Problem Solving Code: ECSP101**

**LIST OF EXPERIMENT (FIRST YEAR) Session: 2023-24**

1) Demonstrate basic data types in C and implement arithmetic expressions
   a. Write a C program to display information like Name, Gender, Branch, Roll Number and Percentage of Previous Examination for a student.
   b. Write a C program to find area and circumference of a sphere.
   c. Program to convert temperature from degree centigrade to Fahrenheit

2) Implement programs using Decision Control Structures.
   a. Write a C program to check whether the triangle is Equilateral, Isosceles or Scalene triangle.
   b. Write a C program to input marks of five subjects Physics, Chemistry, Biology, Mathematics and Computer. Calculate percentage and grade according to following:
      Percentage >= 90% : Grade A
      Percentage >= 80% : Grade B
      Percentage >= 70% : Grade C
      Percentage >= 60% : Grade D
      Percentage >= 40% : Grade E
      Percentage < 40% : Grade F
   c. Write a C program to check whether entered character is digits, special symbol or alphabet and if its is a alphabet wheteher it is a vowel or consonant.

3) Demonstrate use of Loop Control Structures
   a. Write a C program to Count the Number of Digits in a multidigit number entered through keyboard.
   b. Write Program to find out the sum of series 1^2 + 2^2 + 3^2 + 4^2 + 5^2….
   c. Write a program to find sum of numbers (max 10 nos.) entered through the keyboard.
   d. Write a C program to print following pattern

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* *
* * *
* * * *
* * * * *
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4) Implement programs using Multi-way Decision Control Structures (Switch Case)
   a. Write a menu driven C program to perform bitwise operations on decimal number.

| Choice Code | Action |
|---|---|
| A | Bitwise AND |
| B | Bitwise OR |
| C | Bitwise XOR |
| D | Bitwise Complement |
| Otherwise | Invalid Choice |

b. Write a menu driven program using switch case which has following options:
   i) Factorial of a number
   ii) Prime or not
   iii) Odd or even
   iv) Exit

5) Apply Functions and Recursions to simple programs.
   a. Write a C program to perform swapping using function.
   b. Write a C program to find fibonacci series using recursion
   c. Write a C program to find Sum of Natural Numbers Using Recursion
6) Initialize array and apply it to solve 1D and 2D array problems.
   a. Write a C program to obtain transpose of a 3 x 5 matrix.
   b. Write a C program to multiply two matrices whose elements as well as number of rows and columns are entered through keyboard.
   c. Write a C program to implement Selection Sort on 10 numbers entered through keyboard.
7) Demonstrate use of Structures and Pointers.
   a. Using structure write a C program to Calculate Total and Percentage marks of a student using structure.
   b. Write a C program to swap data, using concept of call by reference
   c. Write a C program to illustrate how to access the numbers of a structure and modify them in C
8) Apply file handling concepts in C.
   a. Write a C program to Count the number of characters, spaces, tabs and newlines in a file.
   b. Write a C program to append the contents of one file at the end of another.

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