C Programming Assignment

1. Accept the radius from user and compute the area and circumference of a circle.

2. Accept a character from user and display ASCII value of it.

3. Accept marks of 5 subjects (out of 100) of a student and display total marks and compute the percentage also.

4. Accept the basic salary of an employee and compute the net salary after adding earnings and subtracting deductions.

   PF is 2 % of basic
   Tax is 3 % of basic
   HRA is 5 % basic
   DA is 8 % of basic

5. Accept two numbers and swap two numbers using

i) Third variable

ii) By performing arithmetic operations

6. Accept dimensions of a cylinder and print the surface area and volume (Hint: surface area = 2πr 2 + 2πrh, volume = π r 2 h). Define a constant variable pi=3.14.

7. Accept temperatures in Fahrenheit (F) and print it in Celsius(C) and Kelvin (K) (Hint: C=5/9(F-32), K = C + 273.15)

8. Write the program to display 5 employee details with their Employee_Name, Employee_id and department.

9. Program to Find the Size of int, float, double, and char.

10. Accept program for Area and Perimeter Of Rectangle.

11. Write a program Multiply two Floating Point Numbers.

12. Write a c programs to display Simple interest.

If - else

1. Write a program to accept an integer and check if it is even or odd.

2. Write a program to accept a number and check if it is divisible by 5 and 7.

3. Write a program, which accepts annual basic salary of an employee and calculates and displays the Income tax as per the following rules.

Basic: < 1, 50,000 Tax = 0

1, 50,000 to 3,00,000 Tax = 20%

> 3,00,000 Tax = 30%

4. Accept a lowercase character from the user and check whether the character is a vowel or consonant. (Hint: a, e, i, o, u are vowels)

5. Write a C program to input angles of a triangle and check whether triangle is valid or not.

6. Write a C program to check whether a entered character is uppercase or lowercase alphabet.

7. Write a C program to accept a character and invert the case of it.

8. Write a program to accept 3 numbers and compute minimum and maximum from them.

9. Program to display a number if it is negative.

10. Program to display 3 students grades with marks>75 with Grade =A+ marks<75 and marks>65 grade = A and marks <60 grade=B

Switch – case

1. Accept a single digit from the user and display it in words. For example, if digit entered is 9, display Nine.

2. Write a program, which accepts two integers and an operator as a character (+ - * /), performs the corresponding operation and displays the result.

3. Accept two numbers in variables x and y from the user and perform the following operations

Options	**Actions**
1.	Equality Check if x is equal to y
2.	Less Than Check if x is less than y
3.	Quotient and Remainder Divide x by y and display the quotient and remainder
4.	Range : Accept a number and check if it lies between x and y (both inclusive)
5.	Swap : Interchange x and y

4. Accept radius from the user and write a program having menu with the following options and corresponding actions:

Options	**Actions**
1.	Area of Circle
2.	Circumference of Circle
3.	Volume of Sphere

5. Write a program having menu that has three options - add, subtract or multiply two fractions. The two fractions and the options are taken as input and the result is displayed as output. Each fraction is read as two integers, numerator and denominator.

6. Write the menu driven program with even, odd,positive, negative numbers.

7. Write a program having a menu that Simple Calculator.

8. Write the program having menu to display student information with accept employee_name,emp_id,Employee salary,display employee details.

Loops

1. Write a program that accepts numbers continuously as long as the number is positive and prints the sum of the given numbers.
2. Write a program to accept two integers x and n and compute x raised to n.
3. Write a program to accept a character, an integer n and display the next n characters.
4. Write a program to calculate factorial of a number.
   For e.g. factorial of 5 = 5! = 5 *4*3*2*1 = 120
5. Write a program to calculate factors of a given number.
6. Accept two numbers and calculate GCD of them.
7. Write a menu driven program to do following operations :

   a) Compute area of circle

   b) Compute area of rectangle

   c) Compute area of triangle

   d) Exit

   Display menu, ask choice to the user, depending on choice accept the parameters and perform the operation. Continue this process until user selects exit option.

8. Write a program to print all prime numbers between 1 to n.
9. Write a program to Compute Quotient and Remainder of numbers.
10. Write a program to check Whether a Number is Palindrome or Not.
11. Write the c program to Display Factors of a Number.
12. Write the program to display patterns:
13.

a) *****
****
***
**
*

b) 54321
4321
321
21
1

c) ABCDE
ABCD
ABC
AB
A

d) 1
121
12321
1234321
123454321

Array

1D array

1. Write a program to accept n numbers in an array and display the largest and smallest number. Using these values, calculate the range of elements in the array.
2. Write a program to store n numbers in array and display them in reverse order.
3. Write a Program for deletion of an element from the specified location from Array.
4. Write a program to accept an array of n elements and a number say key. Check whether key is present in the array or not.
5. Write a program to accept an integer array and an integer say num and counts the occurrences of the num in the array.
6. Write a program to accept n numbers from the user and store them in an array. Then sort the array in descending order and display it.
7. Write a program to accept a decimal number and convert it to binary.

2D array

1. Write a program to accept, display and print the sum of elements of each row and sum of elements of each column of a matrix.
2. Write a program to accept a matrix A of size mXn and store its transpose in matrix B. Display matrix B.
3. Write a program to add and multiply two matrices. Perform necessary checks before adding and multiplying the matrices.
4. Write a program to perform the following operations on a square matrix. Write
   - i) Check if the matrix is symmetric.
   - ii) Display the trace of the matrix (sum of diagonal elements).
   - iii) Check if the matrix is an upper triangular matrix.

5. Write a program to find transpose of matrix.

String

1. Write a program which accepts a sentence from the user and alters it as follows: Every space is replaced by *, case of all alphabets is reversed, digits are replaced by?
2. Write a program that accepts n strings and displays the longest string. Use array of strings.
3. Write a menu driven program to perform the following operations on strings using standard library functions: Length, Copy, Concatenation, Compare, Reverse, Uppercase, Lowercase, Check case.
4. Write a Program to check if a Given String is Palindrome.
5. Write a Program for Print reverse of a string using recursion.
6. Write a Program for Return maximum occurring character in the input string.

Functions

1. Write a program to check whether character is a lowercase or not or space. (Use In build library function)
2. Write a program to calculate sum of first 20 natural numbers using recursive function.
3. Write a program to convert decimal number to binary using function.
4. Write a program to swap two integers using call by value and call by reference methods of passing arguments to a function.
5. Write a program to find sum of digits of the number using Recursive Function.
6. Write a program to read an integer number and print the reverse of that number using recursion.
7. Write a C program to check number is palindrome or not using functions.
8. Write a C program to check whether a number is perfect number or not using functions.
9. Write a C program to check whether a number is prime, Armstrong or perfect number using functions.
10. Write a C program to find power of any number using recursion.
11. Write a C program to count the total number of characters in an input line through keyboard using recursive function.
12. Write a program to perform the following operations using function.
    - i) To find maximum and minimum between two numbers
    - ii) To check whether a number is even or odd
    - iii) To print Pascal triangle

Pointers

1. WAP to accept an array of n integers and calculate sum of odd numbers and even numbers using the pointer to an array.
2. Write a C program to add two numbers using pointers.
3. Write a C program to copy one array to another using pointers.
4. Write a C program to sort array using pointers.
5. WAP to accept an array of n integers and calculate sum of odd numbers and even numbers using the pointer to an array.
6. Write a function isEven, which accepts an integer as parameter and returns 1 if the number is even, and 0 otherwise. Use this function in main to accept n numbers and ckeck if they are even or odd.
7. Write a function isPrime, which accepts an integer as parameter and returns 1 if the number is prime and 0 otherwise. Use this function in main to display the first 10 prime numbers.
8. For the following standard functions, write corresponding user defined functions and write a menu driven program to use them. strcat, strcmp, strrev, strupr.
9. Write a function power, which calculates x raised to y. Write another function, which calculates n! Using for loop. Use these functions to calculate the sum of first n terms of the Taylor series:

   sin(x) = x - 3! 3 x + 5! 5 x + ……

10. Write a recursive C function to calculate the GCD of two numbers. Use this function in main. The GCD is calculated as:

gcd(a,b) = a if b = 0

= gcd (b, a mod b) otherwise.

11. Write a recursive C function to calculate x raised to y. (Do not use standard library function)

12. Write a recursive function to calculate the sum of digits of a number till you get a single digit number. Example: 961 -> 16 -> 5. (Note: Do not use a loop)

13. Write a recursive function to calculate the nth Fibonacci number. Use this function in main to display the first n Fibonacci numbers.

The recursive definition of nth Fibonacci number is as follows:

fib(n) = 0 if n = 1

= 1 if n = 2

= fib(n-2) + fib(n-1) if n>2

Structure

1. Create a structure student (roll number, name, marks of 3 subjects, percentage). Accept details of n students and write a menu driven program to perform the following operations.

   Write separate functions for the different options.

   i) Search
   ii) Modify
   iii) Display all student details
   iv) Display all student having percentage > 80
   v) Display student having maximum percentage

2. Create a structure employee (id, name, salary). Accept details of n employees and write a menu driven program to perform the following operations. Write separate functions for the different options.

   i) Search by name
   ii) Search by id
   iii) Display all
   iv) Display all employees having salary > 25000
   v) Display employee having maximum

3. The following structure is for a library book with the following details: id, title, publisher, code (1 – Text book, 2 – Magazine, 3 – Reference book). If the code is 1, store no-of-copies. If code = 2, store the issue month name. If code = 3, store edition number. Also store the cost.

```
struct library_book
{
   int id;
   char title[80];
   char publisher[20] ;
```

```
    int code;
     union u {
         int no_of_copies;
         char month[10];
         int edition;
    }info;
   int cost;
};
```

Write a program to accept details of n books. Use switch - case to accept the code and details according to the code.

4. WAP to display the Inventory of items in a store/shop. The inventory maintains details such as name, price, quantity and manufacturing date of each item.

5. Create a structure named cricket that accepts cricketer name, team name, average and highest score. Enter values for 5 cricketer and display it using concept of array of structure.