**Algorithms, Flowcharts**

1. Draw algorithm and flowchart to swap two numbers using and without using temporary variable
2. Algorithm and flowchart to find odd and even numbers from 1 to n
3. Algorithm & Flowchart to find sum and average of given series of numbers
4. To find the roots of quadratic equation
5. Snake and ladder game

**Programs in C (Operators)**

1. Write the logic to find binary equivalent of a decimal number using bitwise operator.
2. Write a logic to check whether binary representation of an integer contains all 1s or not.

* Definition of Done: Logic shall contain only bitwise operator

1. Write a C program to swap two integers.

* Definition of Done:

1. The program asks the user to input two integers
2. The program shall use bitwise XOR.

4. Write a C program to find the maximum and minimum of two numbers

1st Method:

Definition of Done:

1. The program asks the user to take the two integers x and y.
2. The program shall use bitwise XOR and comparison operator.

2nd Method:

Definition of Done:

1. The program asks the user to take the two integers x and y.
2. The program shall use only arithmetic operators

5. Write a program in C to find a third angle if two angles of triangle are given

Definition of Done:

1. The program asks the user to input the angles in degree.
2. The program calculates the third angle and outputs the result in degree and radian
3. Output as:

The third angle in degrees:

The third angle in radians:

1. Program in C to check if two numbers are equal without using arithmetic operators or comparison operators.
2. Program in C to divide an integer by 4 without using ‘/’ operator.

**Definition of Done:**

1. The program should ask the user to enter any integer.
2. The program can use any operator or loop except ‘/’ operator.
3. The program outputs “The value of entered number …. divided by 4 is….”.
4. Program in C to find the permutation and combination of two numbers

**Definition of Done:**

1. The program should ask the user to enter two integers and store it in variables n and r.
2. The program should output in the following format:

“ The permutation (nPr) of n (value of n) and r (value of r) is ….”

“ The combination (nCr) of n (value of n) and r (value of r) is ….”

1. Write a program in C to determine whether a point lies inside the circle, on the circle or outside the circle.

**Definition of Done:**

1. The program asks the user to input a (x,y) coordinate and radius of circle.
2. The program shall use if-else statement to output the result.

**Loops**

1. Write a program in C to print the sum of first n natural numbers.

Definition of Done:

1. The program should ask the user to enter the value of n (positive integer). If not positive, ask the user to input appropriate value.
2. The program should use while, do-while and for loop.
3. Write a program in C to print the pattern using for loop

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Definition of Done:

1. The program should ask the user to input the height of the pattern.
2. Using different heights, pattern will be different and appears as Z.
3. Write a program in C to print the pattern using for loop

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Definition of Done:

1. The program should ask the user to input the height of the pattern.
2. Using different heights, pattern will be different and appears as hollow square.
3. Program in C to print the multiplication table for 4 and 5, multiplied upto 10 using nested for loop

Definition of Done:

1. The program should output the result as :

4 \* 0 = 0

4 \* 1 = 4

Upto 10

**C Programs (using functions)**

1. Write a program using function to print message “Hello C!” 20 times without using any loop.

**Definition of Done:**

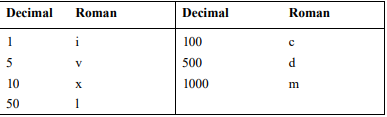
1. The program asks the user to print the message.
2. The program should use a function which accepts the message and count as arguments.
3. Write a function using function to print character with their ASCII codes from 32 to 254.

**Definition of Done:**

1. The output should be in the form of ASCII table, which is to printed in the form,

ASCII character : ASCII code.

1. Write a general-purpose function to convert any given year into its roman equivalent. The following table shows the roman equivalents of decimal numbers



Example: Roman equivalent of 1988 is mdcccclxxxviii

Roman equivalent of 1525 is mdxxv

4. A positive integer is entered through the keyboard. Write a function to obtain the prime factors of this number. For example, prime factors of 24 are 2, 2, 2 and 3, whereas prime factors of 35 are 5 and 7.

5. A positive integer is entered through the keyboard, write a program to obtain the prime factors of the number. Modify the function suitably to obtain the prime factors recursively.

6. A positive integer is entered through the keyboard, write a function to find the binary equivalent of this number using recursion.

7. Write a C function to evaluate the series

sin(x) = x − (x 3 / 3!) + (x 5 / 5!) − (x 7 / 7!) +…. to five significant digits.

8. Given three variables x, y, z write a function to circularly shift their values to right. In other words if x = 5, y = 8, z = 10 after circular shift y = 5, z = 8, x =10 after circular shift y = 5, z = 8 and x = 10. Call the function with variables a, b, c to circularly shift values.

9. Write a function to compute the distance between two points and use it to develop another function that will compute the area of the triangle whose vertices are A(x1, y1), B(x2, y2), and C(x3, y3). Use these functions to develop a function which returns a value 1 if the point (x, y) lines inside the triangle ABC, otherwise a value 0.

10. C program to read a value and print its corresponding percentage from 1% to 100% using recursion

11. C program to print the pattern using function

**Definition of Done:**

Input row=7, column=7

Output:

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**C Programs on Arrays and Strings**

1. Write a program to insert an element at a specific position in an array.

DoD1: Ask the user to input an index of an array at which an element is to be inserted

DoD2: Print the array before and after inserting an element

1. Write a program to delete a specific element from an array

1st method:

DoD1: Ask the user to input an index from which an element is to be deleted

2nd method:

DoD1: Ask the user to input an integer which is to be deleted from an array

1. Write a program to cyclic right-shift the elements of an array.

DoD1: If the elements have to do 2 right-shifts

1. Write a program to sort an array in descending order
2. Write a program to print the following pattern using array

1

1 1

1 2 1

1 3 3 1

DoD1: Ask the user to input the number of lines to be printed

**C Programs on Storage classes and structures & unions**

1. You have to store the name and salary of an employee in a structure and union. Analyze the difference in the memory taken when stored using structures and unions respectively.
2. Write a C program to calculate the percentage of student using structure of arrays
3. Write a C program to distribute the total amount equally into distinguished persons.

Definition of Done:

a. Declare a structure of items, their quantity, individual and total price.

b. Use structure array to store information of multiple items

c. Ask the user to input the number of persons to whom total amount is to be distributed equally.

4. Write a C program to add two polynomials

Definition of Done:

a. Use structures to declare each term and polynomial

b. Use structure to declare function for addition of two polynomials

c. Structure pointers are passed as argument to a function used to initialize polynomial and adding each terms to a polynomial

1. Write a C program to multiply two polynomials

Definition of Done:

a. Use structures to declare each term and polynomial

b. Use structure to declare function for addition and multiplication of two polynomials

c. Structure pointers are passed as argument to a function used to initialize polynomial, adding and multiplying each terms to a polynomial

1. Write a program in C to calculate the first 15 Fibonacci numbers 10,000,000 times, to illustrate the use of register variables.
2. Write a program in C to calculate successive Fibonacci numbers using static variables
3. Write a program in C to calculate compound interest using extern function declaration

**Programs on File**

1. Write a C program to append new content to a file

Definition of done:

* Add something more about yourself in updated file which is named by your name

1. Write a C program to read a file line by line

Definition of done:

* Read the updated above file line by line using fgets()

1. Write a program in C to merge two files and store the contents in another file

Definition of Done:

* Read the contents of two files “YourName.txt” and “fileMgr.txt” and store in other file named “File3.txt”

1. Write a C program to replace a specific line in a text file

Definition of done:

* Read and display the contents of “File3.txt”
* Ask the user to input the line number that he wants to replace
* Ask the user to input updated message.
* Print the file with updated content

1. Write a C program to delete a specific line from a file

Definition of done:

* Read and display the contents of “File3.txt”
* Ask the user to input the line number that he wants to delete
* Copy all the contents to “File4.txt” except the line that is to be deleted