Assignment-1

Programming and Problem Solving with C

Conditional & Looping Constructs

1. Check Even or Odd

```
          ENTER NUMBER TO CHECK EVEN OR ODD: 26
          NUMBER IS EVEN

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```

2. Find Greatest of Three Numbers

```
          ENTER FIRST NUMBER :24
          ENTER SECOND NUMBER :13
          ENTER THIRD NUMBER :26
          GREATEST NUMBER IS 26.000000

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```

3. Check for Leap Year

```
          ENTER YEAR:2024
          YEAR IS LEAP YEAR

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```

4. Sum of Natural Numbers

```
            enter number to add till it: 5
            sum of first 5 natural numbers is 15


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```

5. Multiplication Table

```
            ENTER NUMBER TO GET ITS TABLE:9
            9×1 =9
            9 X 2=18
            9 X 3=27
            9 X 4=36
            9 X 5=45
            9 X 6=54
            9 X 7=63
```

```
            9 X 8=72
            9 X 9=81
            9 X 10=90


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```

6. Reverse a Number

```
            Enter any digit number: 1234
            The reverse of 1234 is: 4321


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```

7. Simple Calculator (using switch)

```
            ENTER FIRST NUMBER:24
            ENTER SECOND NUMBER:25
            ENTER YOUR OPRETION TYPE-
            1 FOR ADDITION
            2 FOR SUBTRACTION
            3 FOR MULTIPLICATION
            4 FOR DIVISION
            1
            SUM OF BOTH NUMBERS IS 49.000000


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```

8. Find Factorial of a Number

```
            ENTER NUMBER TO FINT FACTORIAL:5
            FACTORIAL IS 120


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```

9. Check for Palindrome Number

```
            Enter a number: 12321
            Number is palindrome.


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```

Arrays (1D & 2D)

1. Find Greatest in Array

```
How many numbers do you want to compair:4
1. ENTER NUMBER: 12
2. ENTER NUMBER:54
3. ENTER NUMBER:2
4. ENTER NUMBER:34
54 is greatest among them


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```

2. Calculate Sum and Average of Array Elements

```
ENTER NUMBER OF ELEMENTS: 3
ENTER NUMBER 1:
12
ENTER NUMBER 2:
34
ENTER NUMBER 3: 54
SUM OF ALL NUMBERS 100 AND AVERAGE IS 33.000000

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```

3. Sort Array in Ascending Order

```
Enter number of elements: 4
Enter 4 elements:
12
54
11
9
Array in ascending order:
9 11 12 54

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```

4. Count Frequency of Array Elements

```
ENTER NUMBER OF ELEMENTS: 4
ENTER NUMBER 1: 1
ENTER NUMBER 2: 2
ENTER NUMBER 3: 1
ENTER NUMBER 4:4
1 COMES 2 TIMES
2 COMES 1 TIMES
4 COMES 1 TIMES

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```

5. Merge Two Arrays

```
            ENTER NUMBER OF ELEMENTS IN FIRST ARRAY: 2
            ENTER NUMBER OF ELEMENTS IN SECOND ARRAY: 3
            FOR FIRST ARRAY
            ENTER ELEMENT 1: 1
            ENTER ELEMENT 2: 4
            FOR SECOND ARRAY
            ENTER ELEMENT 1:3
            ENTER ELEMENT 2: 2
            ENTER ELEMENT 3:5
            NEW ARRAY IS:
            1
            4
            3
            2
            5


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```

6. Add Two Matrices (2D Array)

```
            enter number of rows:2
            enter number of columns:2
            for first matrix
            enter number in (0,0):1
            enter number in (0,1):2
            enter number in (1,0):4
            enter number in (1,1):3
            for second matrix
            enter number in (0,0):7
            enter number in (0,1):6
            enter number in (1,0):5
            enter number in (1,1):4
            first matrix is-
            1 2
            4 3
            second matrix is-
            7 6
            5 4
            sum of both matrices is-
            8 8
```

9 7

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7. Find Transpose of a Matrix

```
enter number of rows:2
enter number of columns:3
enter number in (0,0):1
enter number in (0,1):3
enter number in (0,2):2
enter number in (1,0):4
enter number in (1,1):6
enter number in (1,2):5
matrix is-
1 3 2
4 6 5
transpose of matrix is-
1 4
3 6
2 5

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```

8. Sum of Diagonal Elements of a Matrix

```
enter number of rows/columns:2
enter number in (0,0):1
enter number in (0,1):9
enter number in (1,0):8
enter number in (1,1):4
matrix is-
1 9
8 4
sum is 22

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```

Structures

1. Student Details using Structure

```
            student's details-
            name: Ishan Singh
            roll no.: 125113008
            marks: 100


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```

2. Find Student with Maximum Marks

```
            NUMBER OF STUDENTS:3
            FOR STUDENT 1
            ENTER NAME OF STUDENT: Ishan
            ENTER MARKS OF STUDENT:100
            FOR STUDENT 2
            ENTER NAME OF STUDENT: Vaibhav
            ENTER MARKS OF STUDENT: 90
            FOR STUDENT 3
            ENTER NAME OF STUDENT: Tanish
            ENTER MARKS OF STUDENT : 80
            STUDENT WITH MAXIMUM MARKS
            NAME: Ishan
            MARKS: 100


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```

3. Book Details using Structure Array

```
            NUMBER OF BOOKS:3
            FOR BOOK 1
            ENTER NAME OF BOOK: MATHS
            ENTER PRICE OF BOOK:800
            FOR BOOK 2
            ENTER NAME OF BOOK: PHYSICS
            ENTER PRICE OF BOOK: 400
            FOR BOOK 3
            ENTER NAME OF BOOK: CHEMISTRY
```

```
            ENTER PRICE OF BOOK:10
            BOOK NAME "MATHS" AND PRICE IS 800
```

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4. Calculate Average Marks of Students

```
NUMBER OF STUDENTS:3
FOR STUDENT 1
ENTER MARKS OF STUDENT: 100
FOR STUDENT 2
ENTER MARKS OF STUDENT:90
FOR STUDENT 3
ENTER MARKS OF STUDENT: 80
AVERAGE MARKS OF ALL STUDENTS ARE 90.000000
```

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5. Calculate Gross Salary

```
ENTER BASIC SALARY: 100000
ENTER DA SALARY: 20000
ENTER HRA SALARY: 10000
GROSS SALARY OF EMPLOYEE IS 130000.000000
```

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6. Employee Details

```
ENTER EMPLOYEE NAME: Ishan
ENTER EMPLOYEE POST: MANAGER
ENTER EMPLOYEE ADDRESS: JAIPUR
ENTER EMPLOYEE SALARY: 100000
EMPLOYEE DETAILS-
NAME: Ishan
ADDRESS: JAIPUR
POST: MANAGER
SALARY: 100000.000000
```

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7. Student Details with Date of Birth

Enter student name: **Ishan**
Enter roll number: **125113008**
Enter date of birth (DD MM YYYY): **10 07 2008**
Student Details
Name: Ishan
Roll: 125113008
DOB: 10-07-2008

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8. Sort Student Records by Roll Number

```
        Enter number of students: 3
        Enter details of student 1:
        Roll Number: 125113008
        Name: Ishan
        Marks: 100
        Enter details of student 2:
        Roll Number: 125113039
        Name: VAIBHAV
        Marks: 90
        Enter details of student 3:
        Roll Number: 125113047
        Name: TANISH
        Marks: 80
        Student Records (Sorted by Roll Number)
        Roll: 125113039 Name: VAIBHAV Marks: 90.000000
        Roll: 125113008 Name: Ishan Marks: 100.000000
        Roll: 125113047 Name: TANISH Marks: 80.000000

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```

Pointer

1. Swap Two Numbers using Pointers (Call by Reference)

```
        Enter first number: 23
        Enter second number: 12
        Before swaping a a=23 and b=12
        After swaping a a=12 and b=23

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```

2. Sum of Array Elements using Pointers

```
Enter number of elements: 4
Enter 4 elements:
12
13
56
3
Sum of array elements = 84

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```

3. Find Length of String using Pointers

```
Enter string: KURUKSHETRA
string lenth is 11

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```

4. Copy String using Pointers

```
Enter string: Ishan
Second string is Ishan

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```

5. Pass Structure to a Function using Pointers

```
Enter name: Ishan
Enter roll number: 125113008
Enter marks: 95
Student Details
Name: Ishan
Roll: 125113008
Marks: 95.000000
```

```
                After bonus marks:
                Updated Marks: 100.000000


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```

6. Find Largest and Smallest in Array using Pointers

```
                Enter number of elements: 3
                Enter elements 1: 12
                Enter elements 2: 50
                Enter elements 3: 1
                Largest number = 50
                Smallest number = 1


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```

7. Print Array Elements using Pointer Arithmetic

```
        Enter number of elements: 3
        Enter elements 1: 12
        Enter elements 2:45
        Enter elements 3: 23
        Array elements using pointer arithmetic:
        Element 1=12
        Element 2=45
        Element 3=23

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```

8. Print Value and Address

```
        Enter number: 10
        value of number is 10
        address of number 6422296
        address of pointer 6422292

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```

Functions

1. Check Prime Number using Function

```
        Enter your number: 17
        number is prime

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```

2. Factorial using Function

```
        Enter a number: 5
```

```
                Factorial of 5 is 120
```

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3. GCD of Two Numbers using Function

```
                enter first number: 60
                enter second number: 12
                gcd is 12
```

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4. Reverse a Number using Function

```
            Enter a number: 12345
            Reversed number: 54321


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```

5. Sum of Digits using Function

```
            Enter a number: 12345
            Sum of digits is: 15


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```

6. Check Palindrome String using Function

```
            Enter string: naman
            String is palindrome.


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```

7. Add Two Matrices using Function

```
            enter number of rows:2
            enter number of columns:2
            for first matrix
            enter number in (0,0):1
            enter number in (0,1):4
            enter number in (1,0):3
            enter number in (1,1):2
            for second matrix
            enter number in (0,0):8
            enter number in (0,1):7
            enter number in (1,0):5
            enter number in (1,1):2
```

```
first matrix is
1 4
3 2
second matrix is
8 7
5 2
sum of both matrices is
9 11
8 4
```

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8. Average of Array using Function

Enter number of elements: **4**
Enter element: **12**
Enter element: **87**
Enter element: **34**
Enter element: **15**
Average of all numbers is 37.000000

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9. Illustrate Call by Value (Implied from the last code block in Function section)

number is 10
number is 10

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File Handling

1. Write Text to a File

Enter text that you want to write in file:
I
am Ishan Singh.

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2. Read Content from a File

Reading content from file:
I
am Ishan Singh.

```
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```

3. Count Words, Characters, and Lines in a File

```
                Total Words: 7
                Total Characters (excluding spaces): 29
                Total Lines: 4

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```

4. Write Text to File Successfully Message

```
                Text written to file successfully.

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```

5. Append Content to a File

```
                CONTENT OF FILE:
                I
                am Ishan Singh.
                I
                an from JAIPUR.

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```

6. Write and Read Student Records to/from File

```
Enter number of students: 2
Enter details of student 1
Enter name: Ishan
Enter branch: VLSI
Enter roll no.: 125113008
Enter marks: 100
Enter details of student 2
Enter name: VAIBHAV
Enter branch: VLSI
Enter roll no.: 125113039
Enter marks: 90
Student 1 details:
Name: Ishan
Branch: VLSI
Roll: 125113008
Marks: 100.000000
Student 2 details:
Name: VAIBHAV
Branch: VLSI
Roll: 125113039
Marks: 90.000000


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```

7. Read Numbers from File and Calculate Sum/Average

```
Total numbers read: 5
Sum 15.000000
Average=3.000000


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```

8. Merge Two Files

```
Contents of file1.txt and file2.txt successfully merged into
```

file3.txt

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