Software Engineering Assignment

Module : 3.1 (C Language Fundamental)

- **Display This Information using printf**
  1. **Your Name**
  2. **Your Birth date**
  3. **Your Age**
  4. **Your Address**

```
#include <stdio.h>

int main()
{
    printf("Name: Vaja Dipak R. \n");
    printf("Birth Date: 21-Oct-2002 \n");
    printf("Age: 20 Year \n");
    printf("Address: At. Una, Gir Somnath, Gujarat");

    return 0;
}
```

- **Write a program to make Simple calculator (to make addition, subtraction, multiplication, division and modulo)**

```
#include <stdio.h>
```

```
int main()
{
    int num1,num2,result;
    char Operator;

    printf("Enter Operator Which you perform here(+,-,*,/,%): ");
    scanf("%c",&Operator);

    printf("Enter First Number: ");
    scanf("%d",&num1);
    printf("Enter Second Number: ");
    scanf("%d",&num2);

   switch(Operator)
   {
      case '+':
        result = num1 + num2;
        break;

      case '-':
        result = num1 - num2;
        break;

      case '*':
        result = num1 * num2;
        break;

      case '/':
        result = num1 / num2;
        break;

      default:
        printf(" Please Enter valid Operator.");
   }

   printf("%d %c %d = %d",num1,Operator,num2,result);

   return 0;
}
```

❖ WAP to find area of circle, rectangle and triangle

➔ Area of Circle

```
#include <stdio.h>

int main()
{
   float r,area,pi=3.14;
   printf("Enter Radius of Circle :");
   scanf("%f",&r);

   area=pi*r*r;

   printf("Area of Circle = %f",area);

   return 0;
}
```

➔ Area of Rectangle

```
#include <stdio.h>

int main()
{
   int l,w,area;
   printf("Enter width of Rectangle:");
   scanf("%d",&w);
   printf("Enter length of Rectangle:");
   scanf("%d",&l);

   area=l*w;

   printf("Area of Rectangle = %d",area);

   return 0;
```

```
}
```

➔ Area of Triangle

```
#include <stdio.h>

int main()
{
   int b,h,area;
   printf("Enter base of Triangle:");
   scanf("%d",&b);
   printf("Enter hight of Triangle:");
   scanf("%d",&h);

   area=b*h/2;

   printf("Area of Rectangle = %d",area);

   return 0;
}
```

❖ WAP to find simple interest

```
#include <stdio.h>

int main()
{
   int si,a,r,t;
   printf("Enter total Amount:");
   scanf("%d",&a);
   printf("Enter Rate in % :");
   scanf("%d",&r);
   printf("Enter Time (year):");
   scanf("%d",&t);

   si=a*r*t/100;
   printf("Your total Simple Intrest = %d",si);
```

```
    return 0;
}
```

❖ WAP to check if the given year is a leap year or not.

```
#include <stdio.h>

int main()
{
    int y;
    printf("Enter Year to check this year is Leap year or not:");
    scanf("%d",&y);

    if(y%4==0)
    {
        printf("%d is a Leap year",y);
    }
    else
    {
        printf("%d is not a Leap year",y);
    }

    return 0;
}
```

❖ WAP to convert years into days and days into years

➔ <u>Years into Days</u>

```
#include <stdio.h>

int main()
{
    int y,d;
    printf("Enter year: ");
    scanf("%d",&y);
```

```
    d=y*365;
    printf("%d Year = %d Days.",y,d);

    return 0;
}
```

➔ Days into Years

```
#include <stdio.h>

int main()
{
    int d,y,rd;
    printf("Enter Days: ");
    scanf("%d",&d);

    y=d/365;
    rd=d%365;

    printf("%d Days = %d Year and %d Days.",d,y,rd);

    return 0;
}
```

Module : 3.2 (C Language Programing with C)

❖ WAP to make simple calculator (operation include Addition, Subtraction, Multiplication, Division, modulo)

```
#include <stdio.h>

int main()
{
    char opt;
    int a,b,ans;

    printf("Enter Operator which you perform:");
    scanf("%c",&opt);
    printf("Enter Num1 :");
    scanf("%d",&a);
    printf("Enter Num2 :");
    scanf("%d",&b);

    if(opt=='+')
    {
        ans=a+b;
        printf("%d + %d = %d",a,b,ans);
    }
    else if(opt=='-')
    {
        ans=a-b;
        printf("%d - %d = %d",a,b,ans);
    }
    else if(opt=='*')
    {
        ans=a*b;
        printf("%d * %d = %d",a,b,ans);
    }


    else if(opt=='/')
    {
        ans=a/b;
        printf("%d / %d = %d",a,b,ans);
```

```
    }
    else if(opt=='%')
    {
        ans=a%b;
        printf(" Modulo is %d",ans);
    }
    else
    {
        printf("Please Enter valid Operator.");
    }

    return 0;
}
```

❖ WAP to swap two numbers without using third variable

```
#include <stdio.h>

int main()
{
    int a,b;
    printf("Enter Number 1 :");
    scanf("%d",&a);
    printf("Enter Number 2 :");
    scanf("%d",&b);

    a=a+b;
    b=a-b;
    a=a-b;
    printf("Number 1 = %d \n",a);
    printf("Number 2 = %d",b);

    return 0;
}
```

❖ WAP to find number is even or odd using ternary operator

```
#include <stdio.h>

int main()
{
   int a;
   printf("Enter any Number to check Odd or Even:");
   scanf("%d",&a);

   (a%2==0) ?
      printf("This Number is Even"):
      printf("This Number is Odd");

   return 0;
}
```

❖ WAP to show

➔ Monday to Sunday using switch case

```
#include <stdio.h>

int main()
{
   int week;
   printf("Enter day Number between 1 to 7:");
   scanf("%d",&week);

   switch(week)
   {
        case 1:
        printf("Monday");
        break;
        case 2:
        printf("Tuesday");
        break;
        case 3:
        printf("Wednesday");
        break;
```

```
        case 4:
        printf("Thursday");
        break;
        case 5:
        printf("Friday");
        break;
        case 6:
        printf("Saturday");
        break;
        case 7:
        printf("Sunday");
        break;
        default:
        printf("Please enter valid Number");
    }

    return 0;
}
```

➔ Vowel or Consonant using switch case

```
#include <stdio.h>

int main()
{
    char ch;
    printf("Enter any Character to check it Vowel or Consonant:");
    scanf("%c",&ch);

    switch(ch)
    {
        case 'a':
        printf("Vowel");
        break;
        case 'e':
        printf("Vowel");
        break;
        case 'i':
        printf("Vowel");
        break;
        case 'o':
```

```
        printf("Vowel");
        break;
        case 'u':
        printf("Vowel");
        break;
        default:
        printf("Consonant");
    }

    return 0;
}
```

❖ Looping programs:

1. WAP to print 972 to 897 using for loop

```
#include <stdio.h>

int main()
{
    int i;

    for(i=972;i>896;i--)
    {
        printf("%d \n",i);
    }

    return 0;
}
```

2. WAP to take 10 no. Input from user and find out …

➔ How many Even numbers are there

```
#include <stdio.h>

int main()
{
   int i,n,count=0;
   printf("Enter any ten Number one by one: \n");

   for(i=1;i<=10;i++)
   {
      scanf("%d",&n);
      if(n%2==0)
      {
         count++;
      }
   }
   printf("Total %d Even Number in the list.",count);

   return 0;
}
```

➔ How many odd numbers are there

```
#include <stdio.h>

int main()
{
   int i,n,count=0;
   printf("Enter any ten Number one by one: \n");

   for(i=1;i<=10;i++)
   {
      scanf("%d",&n);
      if(n%2!=0)
      {
         count++;
      }
```

```
    }
    printf("Total %d Odd Number in the list.",count);

    return 0;
}
```

➔ Sum of even numbers and Sum of odd numbers

```
#include <stdio.h>

int main()
{
    int i,n,odd=0,even=0;
    printf("Enter any ten Number one by one: \n");

    for(i=1;i<=3;i++)
    {
        scanf("%d",&n);
        if(n%2==0)
        {
            even+=n;
        }
        else
        {
            odd+=n;
        }
    }
    printf("Sum of total Even Number = %d \n",even);
    printf("Sum 0f total Odd Number = %d",odd);

    return 0;
}
```

3. WAP to print table up to given numbers

```
#include <stdio.h>

int main()
{
```

```
    int i,n,ans;
    printf("Enter a Number to print there table :");
    scanf("%d",&n);

    for(i=1;i<=10;i++)
    {
        ans=n*i;
        printf("%d X %d = %d \n",n,i,ans);
    }

    return 0;
}
```

❖ WAP to print factorial of given number

```
#include <stdio.h>

int main()
{
    int n,i,fact=1;
    printf("Enter Number to find these Factorial:");
    scanf("%d",&n);

    for(i=1;i<=n;i++)
    {
        fact*=i;
    }
    printf("Factorial of %d is %d",n,fact);

    return 0;
}
```

❖ WAP to print Fibonacci series up to given numbers

```
#include <stdio.h>

int main()
{
   int n,i,a,b=0,c=1;
   printf("Enter Number to print fibonacci series:");
   scanf("%d",&n);

   for(i=1;i<=n;i++)
   {
      a=b+c;
      b=c;
      c=a;
      printf("%d,",b);
   }

   return 0;
}
```

❖ WAP to print number in reverse order e.g.: number = 64728 ---> reverse = 82746

```
#include <stdio.h>

int main()
{
   int n,r,rev;
   printf("Enter Number to Print it's Reverse Number:");
   scanf("%d",&n);

   while(n>0)
   {
      r=n%10;
      printf("%d",r);
      n=n/10;
   }
   return 0;
}
```

❖ Write a program to find out the max from given number (E.g., No: -1562 Max number is 6)

```
#include <stdio.h>

int main()
{
    int n,r,max=0;
    printf("Enter any Number:");
    scanf("%d",&n);

    while(n>0)
    {
        r=n%10;
        if(max<r)
        {
            max=r;
        }
        n=n/10;
    }
    printf("%d",max);

    return 0;
}
```

❖ Write a program make a summation of given number (E.g., 1523 Ans: -11)

```
#include <stdio.h>

int main()
{
    int n,r,sum=0;
    printf("Enter Number:");
    scanf("%d",&n);
```

```
    while(n>0)
    {
        r=n%10;
        sum+=r;
        n=n/10;
    }
    printf("%d",sum);

    return 0;
}
```

❖ Write a program you ha ve to make a summation of first and last Digit. (E.g., 1234 Ans: -5)

```
#include <stdio.h>

int main()
{
    int n,fd,ld,sum;
    printf("Enter Number:");
    scanf("%d",&n);

    ld=n%10;

    while(n>9)
    {
        n=n/10;
    }
    fd=n;

    sum=fd+ld;
    printf("Summation of first and last digit = %d",sum);

    return 0;
}
```

❖ Patterns:

➔ **1**
1 0
1 0 1
1 0 1 0
1 0 1 0 1

```
#include <stdio.h>

int main()
{
    int i,j,r;

    for(i=1;i<=6;i++)
    {
        for(j=1;j<i;j++)
        {
            r=j%2;
            printf("%d ",r);
        }
        printf("\n");
    }

    return 0;
}
```

➔ **1**
2 3
4 5 6
7 8 9 10
11 12 13 14 15

```
#include<stdio.h>

int main()
```

```
{
    int i,j,n=1;

    for(i=1;i<6;i++)
    {
        for(j=0;j<i;j++)
        {
            printf("%d ",n);
            n++;
        }
        printf("\n");
    }
    return 0;
}
```

➔ **A**
B C
D E F
G H I J
K L M N O

```
#include<stdio.h>

int main()
{
    int i,j;
    char ch=65;

    for(i=1;i<6;i++)
    {
        for(j=0;j<i;j++)
        {
            printf("%c ",ch);
            ch++;
        }
        printf("\n");
    }
    return 0;
}
```

➔ **A**
A B
A B C
A B C D
A B C D E

```
#include <stdio.h>

int main()
{
   int i,j;
   char ch;

   for(i=1;i<6;i++)
   {
      ch=65;
      for(j=0;j<i;j++)
      {
         printf("%c ",ch);
         ch++;
      }
      printf("\n");
   }
   return 0;
}
```

➔

```
          *
        * * *
      * * * * *
    * * * * * * *
  * * * * * * * * *
```

```
#include <stdio.h>

int main()
{
```

```
    int i,j;
    for (i=1;i<=6;i++)
    {
        for(j=i;j<6;j++)
        {
            printf("  ");
        }
        for(j=1;j<2*i;j++)
        {
            printf("* ");
        }
        printf("\n");
    }

    return 0;
}
```

➔

```
*
* *
* * *
* * * *
* * * * *
* * * * * *
* * * * *
* * * *
* * *
* *
*
```

```
#include <stdio.h>

int main() {

    int i,j;
```

```
    for (i=1;i<=6;i++)
    {
        for(j=1;j<=i;j++)
        {
            printf("* ");
        }
        printf("\n");
    }

    for (i=5;i>0;i--)
    {
        for(j=1;j<=i;j++)
        {
            printf("* ");
        }
        printf("\n");
    }

    return 0;
}
```

MODULE: 3.3 (File Handling and Debugging)

❖ WAP to find out the max number from given array using function

```
#include<stdio.h>
int max(int n[])
{
	int i,max=n[0];

	for(i=0;i<5;i++)
	{

		if(n[i]>max)
		{
			max=n[i];
		}
	}
	printf("Max value in this list is : %d",max);
}

main()
{
	int i, n[5];

	for(i=0;i<5;i++)
	{
		printf("Enter value of array : ");
		scanf("%d",&n[i]);
	}
	max(n);
}
```

❖ WAP of Addition, Subtraction, Multiplication and Division using Switch case.(Must Be Menu Driven)

```
#include<stdio.h>
main()
{
        int n,a,b,c;

        printf("Enter value of A : ");
        scanf("%d",&a);
        printf("Enter value of B : ");
        scanf("%d",&b);
        printf("\n");

        printf("Keys / Process \n");
        printf(" 1.  Addition \n");
        printf(" 2.  Subtraction \n");
        printf(" 3.  Multiplication \n");
        printf(" 4.  Division \n\n");

        printf("Please enter process key : ");
        scanf("%d",&n);

        switch(n)
        {
        case 1:
                printf("\n Addition process Selected. \n");
                printf("%d + %d = %d",a,b,c=a+b);
                break;

        case 2:
                printf("\n Subtraction process Selected. \n");
                printf("%d - %d = %d",a,b,c=a-b);
                break;

        case 3:
                printf("\n Multiplication process Selected. \n");
                printf("%d * %d = %d",a,b,c=a*b);
                break;
```

```
        case 4:
                printf("\n Division process Selected. \n");
                printf("%d / %d = %d",a,b,c=a/b);
                break;

        default:
                printf("Please enter valid key..!!");
                break;
        }
}
```

❖ WAP to find reverse of string using recursion

```
#include<stdio.h>
int reverse(char *nm)
{
        if(*nm)
        {
                reverse(nm+1);
                printf("%c",*nm);
        }
}
main()
{
        char nm[20];
        printf("Enter any string : ");
        gets(nm);
        reverse(nm);
        return 0;
}
```

❖ WAP to find factorial using recursion

```
#include<stdio.h>
int factorial(int x)
{
        if(x>1)
        {
                return x*factorial(x-1);
        }
}
main()
{
        printf("%d",factorial(5));
}
```

❖ WAP to take two Array input from user and sort them in ascending or descending order as per user's choice

```
#include<stdio.h>
main()
{
  int i, j, As, Bs, a[20], b[20], temp;
  printf("Enter first array size : ");
  scanf("%d",&As);
  printf("\n");

        for(i=0;i<As;i++)
        {
                printf("Enter first array values : ");
                scanf("%d",&a[i]);
        }
        printf("\n");

  printf("Enter second array size : ");
  scanf("%d",&Bs);
  printf("\n");
```

```
        for(i=0;i<Bs;i++)
        {
                printf("Enter second array values : ");
                scanf("%d",&b[i]);
        }

printf("\n 1.  Ascending order \n 2.  Descending order \n\n");
printf("Enter sorting type : ");
scanf("%d",&i);

switch(i)
{
case 1:
        for (i = 0; i < As; i++) {              // Sort first array in Ascending order
                for (j = i+1; j < As; j++) {
                        if(a[i] > a[j]) {
                                temp = a[i];
                                a[i] = a[j];
                                a[j] = temp;
                        }
                }
        }

        printf("\nSorted in ascending order of first array : ");
        for (i = 0; i < As; i++)
        {
                printf("%d, ", a[i]);
        }

        for (i = 0; i < Bs; i++) {              // Sort second array in Ascending order
                for (j = i+1; j < Bs; j++) {
                        if(b[i] > b[j]) {
                                temp = b[i];
                                b[i] = b[j];
                                b[j] = temp;
                        }
                }
        }

        printf("\n\nSorted in ascending order of second array : ");
```

```
        for (i = 0; i < Bs; i++)
        {
                printf("%d, ", b[i]);
        }
        break;

  case 2:
        for (i = 0; i < As; i++) {              // Sort first array in Descending order
                for (j = i+1; j < As; j++) {
                        if(a[i] < a[j]) {
                            temp = a[i];
                            a[i] = a[j];
                            a[j] = temp;
                        }
                }
        }

        printf("\nSorted in Descending order of first array : ");
        for (i = 0; i < As; i++)
        {
                printf("%d, ", a[i]);
        }

        for (i = 0; i < Bs; i++) {              // Sort second array in Descending order
                for (j = i+1; j < Bs; j++) {
                        if(b[i] < b[j]) {
                            temp = b[i];
                            b[i] = b[j];
                            b[j] = temp;
                        }
                }
        }

        printf("\n\nSorted in Descending order of second array : ");
        for (i = 0; i < Bs; i++)
        {
                printf("%d, ", b[i]);
        }break;
  }
}
```

❖ WAP to make addition, Subtraction and multiplication of two matrix using 2-D Array

```
#include<stdio.h>
main()
{
	int a[2][3], b[2][3], i, j;

	for(i=0;i<2;i++)		//get first matrix value
	{
		for(j=0;j<3;j++)
		{
			printf("Enter matrix 1 [%d][%d] : ",i,j);
			scanf("%d",&a[i][j]);
		}
		printf("\n");
	}

	for(i=0;i<2;i++)		//get second matrix value
	{
		for(j=0;j<3;j++)
		{
			printf("Enter matrix 2 [%d][%d] : ",i,j);
			scanf("%d",&b[i][j]);
		}
		printf("\n");
	}

	for(i=0;i<2;i++)		//print first matrix
	{
		for(j=0;j<3;j++)
		{
			printf("%d ",a[i][j]);
		}
		printf("\n");
	}
	printf("\n");

	for(i=0;i<2;i++)		//print second matrix
	{
```

```
                for(j=0;j<3;j++)
                {
                        printf("%d ",b[i][j]);
                }
                printf("\n");
        }
        printf("\n\n");


    printf("Addition of the matrix \n");
    for(i=0;i<2;i++)                    //print addition of the matrix
    {
        for(j=0;j<3;j++)
        {
                printf("%d  ",a[i][j] + b[i][j]);
        }printf("\n");
    }printf("\n");

    printf("Subtraction of the matrix \n");
    for(i=0;i<2;i++)                    //print subtraction of the matrix
    {
        for(j=0;j<3;j++)
        {
                printf("%d  ",a[i][j] - b[i][j]);
        }printf("\n");
    }printf("\n");

    printf("Multiplication of the matrix \n");
    for(i=0;i<2;i++)                    //print multiplication of the matrix
    {
        for(j=0;j<3;j++)
        {
                printf("%d  ",a[i][j] * b[i][j]);
        }
        printf("\n");
    }
}
```

❖ WAP Find out length of string without using inbuilt function

```
#include<stdio.h>
main()
{
        char name[50];
        int i,len=0;

        printf("Enter any string : ");
        gets(name);

        for(i=0;name[i]!='\0';i++)
        {
                len++;
        }
        printf("Size of this string is : %d",len);
}
```

❖ WAP to reverse a string and check that the string is palindrome or not

```
#include<stdio.h>
main()
{
        char rev[20], nm[20];
        printf("Enter any string : ");
        gets(nm);

        strcpy(rev,nm);
        strrev(rev);

        if(strcmp(nm,rev)==0)
        {
                printf("\n This string is a Palindrome.");
        }
```

```
        else
        {
                printf("\n This string is not a Palindrome.");
        }
}
```

❖ Write a program of structure employee that provides the following information -print and display empno, empname, address and age

```
#include<stdio.h>
struct employee
{
        int empno,age;
        char empname[10], address[10];
}

main()
{
        struct employee e;
        printf("Enter Employee No. : ");
        scanf("%d",&e.empno);
        printf("Enter Employee Name : ");
        scanf("%s",&e.empname);
        printf("Enter Your Address : ");
        scanf("%s",&e.address);
        printf("Enter Your Age : ");
        scanf("%d",&e.age);

        printf("\n Employee Number : %d",e.empno);
        printf("\n Employee Name : %s",e.empname);
        printf("\n Address : %s",e.address);
        printf("\n Age : %d",e.age);
}
```

❖ **Write a program of structure for five employee that provides the following information -print and display empno, empname, address and age**

```
#include<stdio.h>
struct employee
{
        int empno,age;
        char empname[20], address[20];
}
main()
{

        int i;
        struct employee e;

        for(i=1;i<=5;i++)
        {
                printf("Insert details of employee number %d \n\n",i);
                printf("Enter Employee No. : ");
                scanf("%d",&e.empno);
                printf("Enter Employee Name : ");
                scanf("%s",&e.empname);
                printf("Enter Your Address : ");
                scanf("%s",&e.address);
                printf("Enter Your Age : ");
                scanf("%d",&e.age);

                printf("\n Employee Number : %d",e.empno);
                printf("\n Employee Name : %s",e.empname);
                printf("\n Address : %s",e.address);
                printf("\n Age : %d",e.age);

                printf("\n\n\n");
        }
}
```

❖ WAP to show the difference between Structure and Union.

STRUCTURE	UNION
• You can use a struct keyword to define a structure.	• You can use a union keyword to define a union.
• Every member within structure is assigned a unique memory location.	• In union, a memory location is shared by all the data members.
• Changing the value of one data member will not affect other data members in structure.	• Changing the value of one data member will change the value of other data members in union.
• The total size of the structure is the sum of the size of every data member.	• The total size of the union is the size of the largest data member.
• You can retrieve any member at a time in the structure.	• You can access one member at a time in the union.
• It supports flexible array.	• It does not support a flexible array.