MODULE: 3.1 (C Language Fundamental)

1. Display This Information using printf :
   a. Your Name
   b. Your Birth date
   c. You're Age
   d. Your Address

- #include<stdio.h>

```
void main()
{
printf("Name : Raol Abhirajsinh");
printf("\nDOB : 11/08/2001");
printf("\nAge : 21");
printf("\nAddress : ATPO-Sabalwad,Idar,383430");
}
```

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

- #include <stdio.h>

```
void main()

{
        int n1=34,n2=18;

        printf("\nAddition : %d",(n1+n2));
        printf("\nSubstraction : %d",(n1-n2));
        printf("\nMultification : %d",(n1*n2));
        printf("\nDivision : %.2f",((float)n1/n2));
}
```

3. WAP to find area of circle, rectangle and triangle.

```
#include<stdio.h>
#include<math.h>
Void main(){
  int choice;
   printf("Enter
1 to find area of Triangle
2 for finding area of Circle
3 for finding area of Rectangle
");
 scanf("%d",&choice);
  switch(choice) {
    case 1: {
      int a,b,c;
      float s,area;

printf("Enter sides of triangle");

      scanf("%d%d %d",&a,&b,&c);
       s=(float)(a+b+c)/2;
       area=(float)(sqrt(s*(s-a)*(s-b)*(s-c)));
      printf("Area of Triangle is %f",area);
      break;
   }


    case 2: {
      float radius,area;

printf("Enter Radius of Circle");

     scanf("%f",&radius);

  area=(float)3.14159*radius*radius;

      printf("Area of Circle %f",area);
       break;
   }
   case 3: {
      float len,breadth,area;
      printf("Enter Length and Breadth of Rectangle");
       scanf("%f %f",&len,&breadth);
        area=(float)len*breadth;
        printf("Area of Rectangle is %f",area);
```

```
            break;
}

          default: {
            printf("Invalid Choice");
            break;
     }
      }
      }
```

4. WAP to find simple interest.

```
#include<stdio.h>
Void main()
{
Int principal ,  rate , time, interest;
Printf("\nEnter the principal : ");
Scanf("%d",&principal);

Printf("Enter the rate : ");
Scanf("%d",&rate);

Printf("Enter the time : ");
Scanf("%d",&time);

Interest = principal*rate*time/100;
Return 0;

}
```

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

```
#include<stdio.h>

Void main()
{
Int year;
Printf("Enter a year: ");
Scanf("%d",&year);
```

```
If(year % 400 == 0)
{
Printf(“%d is a leap year.”,year);

}
else if(year % 100 == 0)
{
Printf(“%d is not a leap year”,year);

}
else if(year % 4 == 0)
{
Printf(“%d is a leap year : ”,year);

}
else
{
Printf(“%d is not a leap year.”,year);
}
Return 0;
}
```

6. WAP to convert years into days and days into years.

-

```
#include<stdio.h>

void main()
{
int days,years;
printf("\nEnter specific days :",days);
scanf("%d",&days);

years=days/365;
printf("\n\nNumber of years is: %d",years);

printf("\nEnter specific years :",years);
scanf("%d",&years);
days=years*365;
printf("\n\nNumber of days is :%d",days);
return(0);
}
```

MODULE: 3.2 (C Language Programing with C)

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

```
#include<stdio.h>
Void main()
{
Int a,b;
 int sum, difference, product, modulo;
   float quotient;

   printf("Enter First Number: ");
   scanf("%d", &a);
   printf("Enter Second Number: ");
   scanf("%d", &b);

   sum = a+ b;
   difference = a - b;
   product = a * b;
   quotient = (float)a / b;
   modulo = a % b;

   printf("\nSum = %d", sum);
   printf("\nDifference  = %d", difference);
   printf("\nMultiplication = %d", product);
   printf("\nDivision = %.3f", quotient);
   printf("\nRemainder = %d", modulo);

   getch();
   return 0;
}

}
```

2. WAP to swap two numbers without using third variable.

```
#include<stdio.h>
Void  main()
{
int a=10, b=20;
printf("Before swap a=%d b=%d",a,b);
a=a+b;//a=30 (10+20)
b=a-b;//b=10 (30-20)
a=a-b;//a=20 (30-10)

printf("\nAfter swap a=%d b=%d",a,b);

return 0;
}
```

3. WAP to find number is even or odd using ternary operator.

```
#include<stdio.h>
void main()

{
        int a;

        printf("Enter the value A: ");
        scanf("%d",&a);

        if(a%2==0)
        {
                printf("\n%d is Even No.",a);
        }
        else
        {
                printf("\n%d is Odd No.",a);
        }
}
```

4. WAP to show
    1. Monday to Sunday using switch case
    2. Vowel or Consonant using switch case

- Ans 1.

```
#include
Void  main()
   {
      int day;
      printf("\n");
      printf("\n1.Monday");
      printf("\n2.Tuesday");
      printf("\n3.Wednesday");
      printf("\n4.Thursday");
      printf("\n5.Friday");
      printf("\n6.Saturday");
      printf("\n7.Sunday");
      printf("\nEnter a day:");
      scanf("%d",&day);
      switch(day)
      {
         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("Invalid Input");
            break;
    }
    return 0;
}
```

➢ Ans 2.

```
#include <stdio.h>

void main()
{
    char ch;
    printf("Enter any alphabet: ");
    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;
        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;
}
```

5. Looping programs:

5.1. WAP to print 972 to 897 using for loop

- ```
  #include <stdio.h>
  int main()
  {
      int i;
      for(i=972;i>=897;i--)
      {
          printf("%d ",i);
      }
  }
  ```

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

5.3. How many Even numbers are there.

5.4. How many odd numbers are there.

5.5. Sum of even numbers.
  ```

5.6. Sum of odd numbers WAP to print table up to given numbers.

- 5.2 to 5.6

```
#include<stdio.h>

void main()
{
        int i;
        int a[10]={1,2,3,4,5,6,7,8,9,10};
   int i, num, odd_sum = 0, even_sum = 0;
     printf("Enter the value of num\n");
     scanf("%d", &num);

        for(i=0;i<10;i++)
        {
                printf("\n%d\t",a[i]);
        }
        for (i = 1; i <= num; i++)
   {
      if (i % 2 == 0)
         even_sum = even_sum + i;
      else
         odd_sum = odd_sum + i;
   }
    printf("Sum of all odd numbers  = %d\n", odd_sum);
   printf("Sum of all even numbers = %d\n", even_sum);

}
```

6. WAP to print factorial of given number.

```
#include <stdio.h>

void main()
{
  int i,f=1,num;

  printf("Input the number : ");

  scanf("%d",&num);
```

```
 for(i=1;i<=num;i++)
    f=f*i;

 printf("The Factorial of %d is: %d\n",num,f);
}
```

7. WAP to print Fibonacci series up to given numbers.

- #include<stdio.h>

```
void main()
{
 int n1=0,n2=1,n3,i,number;

 printf("Enter the number of elements:");
 scanf("%d",&number);

 printf("\n%d %d",n1,n2);
 for(i=2;i<number;++i)
 {
  n3=n1+n2;
  printf(" %d",n3);
  n1=n2;
  n2=n3;
 }
  return 0;
 }
```

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

- #include <stdio.h>

```
void main(){
   int num,r,sum=0,t;

   printf("Input a number: ");
   scanf("%d",&num);

   for(t=num;num!=0;num=num/10){
      r=num % 10;
      sum=sum*10+r;
   }
printf("The number in reverse order is : %d\n",sum);
}
```

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

- #include<stdio.h>

```
void main()
{
    int a[5],i,max=0;

    printf("Enter Five Value :");
    for(i=0;i<=4;i++)
      {
         scanf("%d",&a[i]);
      }
    for(i=0;i<=4;i++)
      {
        if(a[i]>max)
        {
            max=a[i];
        }
        else
        {
           printf("Maximum is : %d\n",max);

        }
```

```
    }


}
```

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

```
#include<stdio.h>

  void main ()
  {
     int num, sum = 0;

     num = 1234;
     printf("The number is = %d\n",num);
     while(num!=0){

   sum += num % 10;

        num = num / 10;

  }

     printf("Sum: %d\n",sum);


  return 0;


   }
```

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

```
#include <stdio.h>
  void main()
  {
     int n, sum=0, firstDigit, lastDigit;
     printf("Enter number to find sum of first and lastdigit = ");
```

```
    scanf("%d", &n);
    lastDigit = n % 10;

    while(n >= 10)
    {
       n = n / 10;
    }
    firstDigit = n;
    sum = firstDigit + lastDigit;
    printf("Sum of first and last digit = %d", sum);
    return 0;
}
```

❖Patterns:

1. 1 0 pattern

-
```
#include <stdio.h>

void main()
{
   int i, j, N;

   printf("Enter N: ");
   scanf("%d", &N);
   for(i=1; i<=N; i++)
   {
      for(j=1; j<=i; j++)
      {

         if(j % 2 == 1)

         {

            printf("1");
```

```
            }
            else
            {
               printf("0");
            }
         }
         printf("\n");
      }
   }
```

2. A to o pyramid

- #include<stdio.h>

```
void main()
   {
      int n;
      scanf("%d",&n);
      int k = 0;
      for(int i = 0; i < n; i++)
{
         for(int j = 0; j <= i; j++)
         {
            if((i + j) % 2 == 1)
        {
               printf("%c ",(char)(k + 97));
            }
            else
            {
               printf("%c ",(char)(k + 65));
        }
        k++;
         }
         printf("\n");
      }
   }
```

3. Star pyramid

```
#include <stdio.h>
int main() {
  int i, space, rows, k = 0;
  printf("Enter the number of rows: ");
  scanf("%d", &rows)
  for (i = 1; i <= rows; ++I;, k = 0)
    for (space = 1; space <= rows - i;++space) {
      printf("  ");
    }
    while (k != 2 * i - 1) {
      printf("* ");
      ++k;
    }
    printf("\n");
  }
  return 0;
}
```

4. 1 to 15 Number pyramid

```
#include <stdio.h>
void main()
 {
  int rows, i, j, number = 1;
  printf("Enter the number of rows: ");
  scanf("%d", &rows);
  for (i = 1; i <= rows; i++) {

for (j = 1; j <= i; ++j) {

      printf("%d ", number);
      ++number;
    }
    printf("\n");
  }


}
```

5. A to f pattern

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

```
#include<conio.h>
void main()
{
int n, x, y;
printf("Enter number of rows to show character pattern: ");
scanf("%d",&n);
for(x = 1; x <= n; x++)
{
for(y = 1; y <= x; y++)
{
printf("%c",'A' + y -1);
}
printf("\n");
}
}
```

6. Star pattern

```
#include<stdio.h>
#include<conio.h>
void main()
{
int n, x , y;
printf("Enter number of rows to show star pattern: ");
scanf("%d",&n);
for(x = 1; x <= n; x++)
{
for(y = 1; y <= x;  y++)
{
printf("*");
}
printf("\n");
}
for(x = n; x >= 1; x--)
{
for(y = 1; y <= x; y++)
{
printf( "*");
}

printf("\n");
```

```
}

}
```

MODULE: 3.3 (File Handling and Debugging)

1. Write a program to find out the max number from given array using function.

- ```
  #include <stdio.h>

  void main()
  {

     int arr[] = {25, 11, 7, 75, 56};
     int length = sizeof(arr)/sizeof(arr[0]);
     int max = arr[0];

     for (int i = 0; i < length; i++)
        {

       if(arr[i] > max)
           max = arr[i];
     }
  ```
  ```

```
    printf("Largest element present in given array: %d\n", max);
}
```

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

```
#include<stdio.h>
void main()
{
  int n,m,t;
  char c;
  printf("Enter two numbers and operator :\n");
  scanf("%d %d %c", &n, &m, &c);

  switch(c)
  {
    case '+' : printf("Addition is : %d", n+m);
               break;
case '-' : printf("Substraction is %d", n-m);
               break;
    case '*' : printf("Multiplication is %d", n*m);
               break;
    case '/' : printf("Division is %f", (float)n/m);
               break;
    default  : printf("Not valid");
  }


}
```

3. WAP to find reverse of string using recursion.

```
#include <stdio.h>

void swap(char *x, char *y)
{
   char temp = *x;
   *x = *y;
   *y = temp;
}
```

```
void reverse(char *str, int k)
{
   static int i = 0;

   if (*(str + k) == '\0') {
      return;
   }


   reverse(str, k + 1);

   if (i <= k) {
      swap(&str[i++], &str[k]);
   }

}


void main()

{
   char str[] = "Tops Technologies";

   reverse(str, 0);
   printf("Reverse of the given string is %s", str);
}
```

4. WAP to find factorial using recursion.

```
#include<stdio.h>
long int multiplyNumbers(int n);
void main()
 {
   int n;
   printf("Enter a positive integer: ");
   scanf("%d",&n);
   printf("Factorial of %d = %ld", n, multiplyNumbers(n));
   return 0;
}


long int multiplyNumbers(int n)
```

```
if (n>=1)
{

   return n*multiplyNumbers(n-1);
else

}
```

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>
#include<conio.h>
void main()
{
    int a[100],n,i,j;
    printf("Array size: ");
     scanf("%d",&n);
     printf("Elements: ");

   for(i=0;i<n;i++)
  {
     scanf("%d",&a[i]);
  }
    for (int i = 0; i < n; i++)
    {
            for (int j = 0; j < n; j++)
            {
                    if (a[j] > a[i])
                    {
                            int tmp = a[i];
                            a[i] = a[j];
                            a[j] = tmp;
            }
            }
    }
    printf("\n\nAscending : ");
    for (int i = 0; i < n; i++)
{
```

```
                printf(" %d ", a[i]);
        }
        for (int i = 0; i < n; i++)
        {
                for (int j = 0; j < n; j++)
                {
                        if (a[j] < a[i])
                        {
                                int tmp = a[i];
                                a[i] = a[j];
                a[j] = tmp;
                        }
                }
        }
        printf(\n\nDescending : ");
    for (int i = 0; i < n; i++)
        {
                printf(" %d ", a[i]);
        }
    }
```

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

```
➢ #include <stdio.h>
void main()
{
int m, n;
scanf("%d %d",&m,&n);

int i, j;

int mat1[m][n], mat2[m][n], mat3[m][n];
for(i = 0; i < m; i++)
{
for(j = 0; j < n; j++)
scanf("%d",&mat1[i][j]);
}
for(i = 0; i < n; i++)
{
for(j = 0; j < n; j++)
```

```
scanf(“%d”,&mat2[i][j]);
}

for(i = 0; i < m; i++)
{
for(j = 0; j < n; j++)
{
mat3[i][j] = mat1[i][j] + mat2[i][j];
}
}

for(i = 0; i < m; i++)
{
for(j = 0; j < n; j++)
printf(“%d “, mat3[i][j]);
printf(“\n”);
}
}
```

7. WAP Find out length of string without using inbuilt function.

```
#include <stdio.h>

void main()

{

   char string[50];
   int i, length = 0;
    printf("Enter the string: \n");
   gets(string);

   for (i = 0; string[i] != '\0'; i++)
   {
      length++;
   }
   printf("The length of a string is the number of characters in it \n");
 printf("So, the length of %s = %d\n", string,length);
}
```

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

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

void main()
{
  char inputArray[100], reversedArray[100];

 printf("Enter the string for palindrome check\n");
  scanf("%s", inputArray);
  /* Copy input string and reverse it*/
  strcpy(reversedArray, inputArray);
  /* reverse string */
  strrev(reversedArray);
  /* Compare reversed string with inpit string */
  if(strcmp(inputArray, reversedArray) == 0 )
printf("%s is a palindrome.\n", inputArray);
  else
    printf("%s is not a palindrome.\n",inputArray);

  getch();

}
```

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

```
#include <stdio.h>

    struct employee{
       char    name[30];
       int     empId;
       float   salary;
    };

    int main()
```

```
{
   struct employee emp;


   printf("\nEnter details :\n");
   printf("Name ?:");         gets(emp.name);
   printf("ID ?:");           scanf("%d",&emp.empId);
   printf("Salary ?:");       scanf("%f",&emp.salary);

   printf("\nEntered detail is:");
   printf("Name: %s"   ,emp.name);
   printf("Id: %d"     ,emp.empId);
   printf("Salary: %f\n",emp.salary);
}
```

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

- #include <stdio.h>

```
typedef struct
{
   char name[30];
   int id;
   double salary;
}
 Employee;

int main()
{

   int n=2;

   printf("Enter %d Employee Details \n \n",n);
   for(int i=0; i<n; i++){
      printf("Employee %d:- \n",i+1);
```

```
        printf("Name: ");
        scanf("%[^\n]s",employees[i].name);


        printf("Id: ");
        scanf("%d",&employees[i].id);

        printf("Salary: ");
        scanf("%lf",&employees[i].salary);


        char ch = getchar();

        printf("\n");
    }

    printf("---------- All Employees Details ----------\n");
    for(int i=0; i<n; i++){
        printf("Name \t: ");
        printf("%s \n",employees[i].name);

        printf("Id \t: ");
        printf("%d \n",employees[i].id);

        printf("Salary \t: ");
        printf("%.2lf \n",employees[i].salary);

        printf("\n");
    }

    return 0;
}
```

11. WAP to show difference between Structure and Union.

- struct [structure name]
  {
    member definition;

```
   member definition;
   ...
   member definition;
};

(OR)

struct [structure name]
{
   member definition;
   member definition;
   ...
   member definition;
}structure variable declaration;
```