C Programing

Topic 1: Variable declaration, data types, Formatted input and output functions, operators and expressions.

Program 1: WAP to print “hello world” on screen.

```c

# include <stdio.h>

int main()
{
printf("HELLO WORLD!");
}
```

Program 2: WAP to show various ways in which “printf” can be used to display various messages.

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

   printf("\nEnter the number a and b\n");
   scanf("%d %d",&a,&b);

   c=a+b;

   printf("\n Sum is %d\n",c);
   printf("\n Sum of a and b is %d\n",c);
   printf("\n a + b is %d\n",c);
   printf("\n %d + %d is %d\n",a,b,c);
   printf("\n ( %d+%d=%d )\n",a,b,c);

}
```

Program 3: WAP to ask user to enter two numbers and find sum of two numbers.

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

   printf("\nEnter the number a and b\n");
   scanf("%d %d",&a,&b);

   c=a+b;

   printf("Sum is %d \n",c);

}
```

Program 4: WAP to calculate simple interest(p*r*t) and compound interest.

Simple interest: -

```c

    # include<stdio.h>

    main()
    {

    int p,t; float r,SI;

    printf("Enter the Principal - Rate - Time \n");
    scanf("%d %f %d",&p,&r,&t);

    SI=(p*r*t)/100;

    printf("\n Simple Interst is :- %f",SI);

    }


```

Compound interest: -

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

    main()
     {

     float p,r,t,CI,A;

     printf("Enter the Principal - Rate - Time \n");
     scanf("%f %f %f",&p,&r,&t);

     A=p*pow((1+(r/100)),t);

     CI=A-p;

     printf("/n Compund Interest is %f",CI);

     }
```

Program 5: WAP to ask user to enter marks of 5 subject calculate average marks.

```c
  # include <stdio.h>
   main()
  {
    int a,b,c,d,e; float avg;

     printf("\nEnter the MARKS of 5 Subject\n");
     scanf("%d %d %d %d %d",&a,&b,&c,&d,&e);

     avg=(a+b+c+d+e)/5;

     printf("Average Mark is %d \n",c);

  }
```

Program 6: WAP to convert centigrade temperature to Fahrenheit and vice versa.

```c
#include <stdio.h>

main()
{
    float c,f;
    printf("Enter the temp. in F\n");
    scanf("%f",&f);
    c=(5/9)*(f-32);
    printf("Temp. in C is %f\n",c);

    printf("Enter the temp. in C\n");
    scanf("%f",&c);
    f=((9/5)*c)+32;
    printf("Temp. in F is %f\n",f);

}
```

Program 7: WAP to find area of mathematical objects like circle, rectangle and triangle.

```c
# include <stdio.h>
 main()
{
  float x,y,z,r,l,b,h,a;

  printf("Enter the Radius of circle\n");
  scanf("%f",&r);
  x=3.14*r*r;
  printf("Area is %f \n",x);

  printf("Enter the Length and Breath of rectangle\n");
  scanf("%f %f",&l,&b);
  y=l*b;;
  printf("Area is %f \n",y);

  printf("Enter the Base and height of triangle\n");
  scanf("%f %f",&a,&h);
  z=0.5*a*h;
  printf("Area is %f \n",z);

}
```

Program 8: WAP to enter four-digit number and find sum of digits.

```c
# include <stdio.h>

   main()
   {

     int a,b=0;

     printf("\nEnter the number -> ");
     scanf("%d",&a);

     while(a!=0)
     {
      int d=a%10;
      b=b+d;
      a=a/10;
      }

   printf(" Sum of Digit is %d",b);

    }
```

Program 9: WAP to enter a character from keyboard if character is small letter convert to capital or vice versa.

```c

    # include<stdio.h>

    int main()
    {
        char a;
        printf("Enter the Char.\n");
        a=getchar();

        int b=(int)a;

        if(b>=65&&b<=90)
        b=b+32;
        else if(b>=97&&b<=122)
        b=b-32;

        a=(char)b;

        printf("Converted Char is %c",a);


    }
```

Program 10: WAP to enter your DOB and calculate how many days you have lived.

```c
#include<stdio.h>

main()
{
    int d1,m1,y1,d2,m2,y2,d,m,y,t;

    printf("Enter date of birth of in Day Month Year\n");
    scanf("%d %d %d",&d1,&m1,&y1);

    printf("Enter the present date\n");
    scanf("%d %d %d",&d2,&m2,&y2);

    y=y2-y1;
    if(m2>m1)
    m=m2-m1;
    else
    m=m1-m2;
    if(d2>d1)
    d=d2-d1;
    else
    d=d1-d2;

    t=365*y+30*m+d;/* Consider that each year has 365 days and each month has 30 days.*/

    printf(" Total number of days you Lived is %d",t);

}
```

Program 11: WAP to enter time in minutes and find its equivalent hrs and minutes.

```c

  # include <stdio.h>
   main()
  {
    int h,m,a;

    printf("Enter the time in Minute\n");
    scanf("%d",&a);
    h=a/60;
    m=a%60;
    printf("Time is %d hours and %d in minute",h,m);

  }
```

Topic 2: Operators (modulus operator, logical operators, conditional(ternary) operator) and expressions

Program 1: WAP to ask user to enter two numbers and display after swapping of numbers.

```c
# include<stdio.h>

main()
{

int a,b;

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

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

a=a+b;
b=a-b;
a=a-b;

printf("\n\n Intechanged value of A is :- %d",a);
printf("\n\n Interchanged value of B is :- %d",b);

}
```

Program 2: WAP to ask user to enter his age and display whether he is eligible for casting a vote or not. If his age is <18 he is not eligible.

```c
# include<stdio.h>

main()
{
int a;

printf("\n\n\n Enter your AGE \n ");
scanf("%d",&a);

(a>=18)?printf("\n You are eligible for VOTING "):printf("\n You are NOT eligible for VOTING ");

}
```

Program 3: WAP to check if a student is eligible for sitting in ETE or not. If student's attendance <75 and CA<40 he is not allowed to take ETE else, he is allowed. Ask user to enter his attendance and CA marks.

```c
# include<stdio.h>

main()
{

   int ca,att;

   printf("\n\n Enter the Percantage Mark in CA :- ");
   scanf("%d",&ca);

   printf("\n\n Enter the Percantage Attendance :- ");
   scanf("%d",&att);

   ((ca>=40)&&(att>=75))?printf("\n You are elligible for Writing ETE "):printf("\n You are NOT elligible for Writing ETE ");
}
```

Program 4: WAP to find the greatest of 2 numbers using conditional(ternary) operator.

```c

# include <stdio.h>

main()
{

 int a,b;

 printf("Enter the value of a -> ");
 scanf("%d",&a);

 printf("\nEnter the value of b -> ");
 scanf("%d",&b);

 (a<b)?printf("\n %d is Greater than %d",b,a):printf("\n %d is Greater than %d",a,b);

 }
```

Program 5: WAP to find whether number is positive or negative using Conditional (ternary) operator.

```c

  # include<stdio.h>


  main()
  {

  int a;

  printf("\n\n Enter the NUMBER :- ");
  scanf("%d",&a);

  (a>0)?printf("\n Number is Positive "):printf("\n Number is Negative ");

  }
```

Program 6: WAP to ask user to enter his DOB and calculate how many Independence days he had seen in his life.

```c

   # include<stdio.h>

   main()
   {
   int d,m,y,r=0;

   printf("\n\n\n Enter your DOB \n ");
   scanf("%d %d %d",&d,&m,&y);

   r=(y>=1947&&m<10&&d<16)?2016-y:68;

   r=(y<1947)?69:r;

   printf(" No. of Independence days you saw in our life is %d",r);

   }
```

Program 7: WAP to ask user to enter three numbers and find greater out of three numbers.

```c

# include <stdio.h>

main()
{

 int a,b,c;

 printf("Enter the three number\n");
 scanf("%d %d %d",&a,&b,&c);

 if((a>b)&&(a>c))
 printf("\n %d is Greater than %d and %d ",a,b,c);

 if((b>a)&&(b>c))
 printf("\n %d is Greater than %d and %d ",b,a,c);

 if((c>a)&&(c>b))
 printf("\n %d is Greater than %d and %d ",c,b,a);

}
```

Program 8: WAP to calculate bill of stationary items, if a store is selling pen at Rs.10, book at Rs.20 and notebook at Rs.15. Ask user the quantity of each item and display the total bill.

```c

    # include<stdio.h>
    main()
    {
        int p,b,n,t;

        printf("\n\n Price of pen is 10 rupee");
        printf("\n\n Enter the Number of pen you want :- ");
        scanf("%d",&p);

        printf("\n\n Price of Book is 20 rupee");
        printf("\n\n Enter the Number of Book you want :- ");
        scanf("%d",&b);

        printf("\n\n Price of Notebook is 15 rupee");
        printf("\n\n Enter the Number of Notebook you want :- ");
        scanf("%d",&n);

        t=(10*p)+(200*b)+(50*n);

        printf("\n\n     1. Pen      x %d   = %d",p,10*p);
        printf("\n\n     2. Book     x %d   = %d",b,10*b);
        printf("\n\n     1. Notebook x %d   = %d",n,10*n);
        printf("\n\n           Grand Total : %d",t);

        }
```

Topic 3: Decision making (if, if-else, nested if-else), Control transfer (goto, break, continue) and switch statements

Program 1: WAP to show greatest of 2 or 3 numbers using if-else.

```c

# include <stdio.h>

main()
{

 int a,b;

 printf("Enter the value of a -> ");
 scanf("%d",&a);

 printf("\nEnter the value of b -> ");
 scanf("%d",&b);

 if(a<b)
 printf("\n %d is Greater than %d",b,a);
 else
 printf("\n %d is Greater than %d",a,b);

 }
```

Program 2: WAP to find that year entered is leap year or not using if-else.

```c

 # include <stdio.h>

 main()
 {
   int a;

  printf("Enter the Year -> ");
  scanf("%d",&a);

  if((a%4)==0)
  printf("Year is leap year ");
  else
  printf("Year is Non-leap year ");

 }
```

Program 3: WAP to find the number is even or odd using if-else.

```c
# include <stdio.h>

 main()
 {
    int a;

    printf("Enter the number");
    scanf("%d",&a);

    if((a%2)==1)
    printf("Number is odd");
    else
    printf("Number is even");

 }
```

Program 4: WAP to show following conditions using nested if else statement:

Gender: Male
salary>10000 then bonus should be 1000
salary <10000 and >5000, then bonus=500
salary <5000, then bonus=100

Gender: Female
salary>10000 then bonus should be 100
salary <10000 and >5000, then bonus=50
salary <5000, then bonus=10

```c

# include <stdio.h>

 main()
 {
    char g; int s,b=0;

    printf("Enter the Gender(M/F)\n");
    scanf("%c",&g);

    printf("Enter the Salary\n");
    scanf("%d",&s);

    if(g=='M')
    if(s>10000)
    b=1000;
    else if(s<10000&&s>5000)
    b=500;
    else if(s<5000)
    b=100;

    if(g=='F')
    if(s>10000)
    b=100;
    else if(s<10000&&s>5000)
    b=50;
    else if(s<5000)
    b=10;

    printf("You will get bonus of %d Rupee",b);

 }
```

Program 5: WAP using switch statement, asking the user to enter a day number (7-Sunday, 1-Monday, 2-Tuesday, etc.). If the user has entered 6 or 7, then display a message saying "enjoy! Its holiday", else display a message saying "so sad, u still have to work", showing use of break statement also.

```c

#include <stdio.h>

main ()
{
    int c;
    printf("Enter the no. of day like 1-Monday 2-Tuesday .....7-Sunday\n" );
    scanf("%d",&c);

   switch(c)
   {
      case 1:
         printf("So sad,U still have to work" );
         break;
      case 2:
         printf("So sad,U still have to work" );
         break;
      case 3:
         printf("So sad,U still have to work" );
         break;
      case 4:
         printf("So sad,U still have to work" );
         break;
      case 5:
         printf("So sad,U still have to work" );
         break;
      case 6:
         printf("Enjoy! Its Holiday" );
         break;
      case 7:
         printf("Enjoy! Its Holiday" );
         break;
      default :
         printf("Invalid Choice\n" );
   }
   }
```

Program 6: Write a menu driven program using switch case to do different arithmetic operations, showing use of break statement also

```c

#include <stdio.h>

main ()
{
    int a,b,c;
    printf("Enter 1-Addtion        2-Substraction \n" );
    printf("Enter 3-Multiplication 4-Division \n" );
    scanf("%d",&c);

        printf("Enter the Value of A and B \n ");
        scanf("%d %d",&a,&b);

   switch(c)
   {
      case 1:
           c=a+b;
           printf("\n Adding two variable we will get %d",c);
        break;
      case 2:
           c=a-b;
           printf("\n Subtrating two variable we will get %d",c);
        break;
      case 3:
           c=a*b;
           printf("\n Multiplying two variable we will get %d",c);
        break;
      case 4:
           c=a/b;
           printf("\n Dividing two variable we will get %d",c);
        break;
      default :
        printf("Invalid Choice\n" );
   }
 }
```

Program 7: WAP to calculate electricity bill of a user. Ask user to enter units consumed.
If units<=200 each unit is charged at Rs.2
If units>200 and units<=400, for first 200 units charged at Rs.2 and other unit is charged at Rs.4

```c

   # include<stdio.h>

   main()
   {
     int u,r,h;

   printf("\n\n Enter the Unit :- ");
   scanf("%d",&u);

   if(u>200)
   h=u-200;

   if(u<=200)
   {
   r=2*u;
   printf("\n\n    Unit Consume is %d",u);
   printf("\n\n       Bill Amount is : %d",r);
   }
   else if((u>200)&&(u<=400))
   {
   r=2*200+(h*4);
   printf("\n Unit Consume is ");
   printf("\n 200 x 2 is %d",200*2);
   printf("\n %d x 4 is %d",h,h*4);
   printf("\n Bill Amount is : %d",r);
   }
   }
```

Program 8: WAP to calculate area of mathematical objects using switch. Ask user to press ‘r’ for area of rectangle ‘s’ for area of square and ‘c’ for area of circle. Make sure that your program is not case sensitive.

```c

#include <stdio.h>

main ()
{
    int a,b,c; char d;
    printf("Enter r-Rectangle  s-Square \n" );
    printf("Enter c-circle \n" );
    scanf("%c",&d);

   switch(d)
   {
      case 'r':
           printf("Enter the lenght and breath \n ");
           scanf("%d %d",&a,&b);
           c=a*b;
           printf("Area of rectangle %d",c);
           break;
      case 's':
           printf("Enter the side \n ");
           scanf("%d",&a);
           c=a*a;
           printf("Area of Square %d",c);
           break;
      case 'c':
           printf("Enter the radius \n ");
           scanf("%d",&a);
           c=3.14*a*a;
           printf("Area of Circle %d",c);
           break;
      default :
         printf("Invalid Choice\n" );
   }

}
```

Topic 4: Loops (while, do while and for)

Program 1: WAP to calculate factorial of a number.

```c

 # include<stdio.h>

 main()
 {
  int n,i,f;
  printf("Enter the Number\n");
  scanf("%d",&n);

  for(i=1;i<=n;i++)
  f=f*i;

  printf("Factorial of %d is %d",n,f);
 }
```

Program 2: WAP to check whether a number is prime or not?

```c
 # include<stdio.h>

 main()
 {
  int n,i,c=0;
  printf("Enter the Number\n");
  scanf("%d",&n);

  for(i=1;i<=n;i++)
  if(n%i==0)
  c++;

  if(c==2)
  printf("Number is Prime");
  else
  printf("Number is Not-Prime");

 }
```

Program 3: WAP to reverse a given number, it can be of any number of digits.

```c
# include <stdio.h>

 main()
 {

  int a,b=0;

  printf("\nEnter the number -> ");
  scanf("%d",&a);

  while(a!=0)
  {
   b=b*10+a%10;
   a=a/10;
  }

 printf(" Reverse of number is %d",b);

 }
```

Program 4: WAP to check whether number is palindrome or not?

```c
# include <stdio.h>

  main()
  {

   int a,b=0,c;

   printf("\nEnter the number -> ");
   scanf("%d",&a);
   c=a;
   while(a!=0)
   {
    b=b*10+a%10;
    a=a/10;
   }

  if(b==c)
  printf(" Number is Palindrome");
  else
  printf(" Number is Not Palindrome");
  }
```

Program 5: WAP to display all numbers between 20 and 60 except printing numbers which are divisible by 7.

```c


   # include<stdio.h>

   main()
   {
    int i;

    for(i=20;i<=60;i++)
    {
     if(i%7==0)
     continue;
     printf("%d ",i);
    }
   }
```

Program 6: WAP to find even and odd numbers from first 10 numbers.

```c


   # include<stdio.h>

   main()
   {
    int i;

    printf("Even numbers are : ");
    for(i=0;i<=10;i+=2)
    printf("%d ",i);

    printf("\nOdd numbers are : ");
    for(i=1;i<=10;i+=2)
    printf("%d ",i);

   }
```

Program 7: WAP to print A-Z n the form of AB CD EF....

```c
# include<stdio.h>

main()
{
 char i,c=0;

 printf("Even numbers are : ");
 for(i='A';i<='Z';i++)
 {
 c=c+1;
 printf("%c",i);
 if(c==2)
 {
     printf(" ");
     c=0;
 }
 }

}
```

Program 8: WAP to ask user to enter two numbers and find sum of numbers in between those two numbers.

```c

# include <stdio.h>

  main()
  {

   int a,b,c=0,n,i,s=0;

   printf("\nEnter the number -> ");
   scanf("%d",&a);
   b=a;

   while(a!=0) // Counting number of digits
   {
    c++;
    a=a/10;
   }
   i=c;

   while(b!=0)
   {
    if((i==1)||(i==c)) // For Escaping 1st and 4th digit
    {
    b=b/10;
    i--;
    }

    int d=b%10;
    s=s+d;
    b=b/10;
    i--;
   }
  printf(" Sum is : %d",s);

  }
```

Program 9: WAP to ask user to enter a number and display multiplication table in the form of
N*1=....
N*2=....
.
.
N*10=....

```c

# include<stdio.h>

  main()
  {

    int n,i;

    printf("\n\n Enter the Number :- ");
    scanf("%d",&n);

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

```

Program 10: WAP to ask user to enter numbers 10 times, count how many of them are positive, how many are negative and how many zeros.

```c

    # include<stdio.h>

    main()
    {
      int a,i,c1=0,c2=0,c3=0;
        for(i=1;i<=10;i++)
        {
        printf("\nEnter the NUMBER :- ");
        scanf("%d",&a);
        if(a>0)
        c1=c1+1;
        if(a<0)
        c2=c2+1;
        if(a=0)
        c3=c3+1;
        }
        printf("\n Number of Positve were :- %d",c1);
        printf("\n Number of Negative were :- %d",c2);
        printf("\n Number of Zero were :- %d",c3);

    }

```

Topic 5: Loops and Nested loops

Program 1: WAP to display following pattern:

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

```c

# include<stdio.h>

main()
{
 int i,j;

 for(i=1;i<=5;i++)
 {
 for(j=1;j<=i;j++)
 printf("*");

 printf("\n");
 }

}
```

Program 2: WAP to display following pattern:

```
    1
   12
  123
 1234
12345
```

```c

# include<stdio.h>

main()
{
 int i,j,k;

 for(i=1;i<=5;i++)
 {
 for(j=4;j>=i;j--)
 printf(" ");

 for(k=1;k<=i;k++)
 printf("%d",k);

 printf("\n");
 }

}
```

Program 3: WAP to display following pattern:

```
    1
   121
  12321
 1234321
```

```c
# include<stdio.h>

main()
{
 int i,j,k,l;

 for(i=1;i<=4;i++)
 {
 for(j=3;j>=i;j--)
 printf(" ");

 for(k=1;k<=i;k++)
 printf("%d",k);

 for(l=--k;l>1;l--)
 printf("%d",--k);

 printf("\n");
 }

}
```

Program 4: WAP to display following pattern:

```
12345
 2345
  345
   45
    5
```

```c
# include<stdio.h>

main()
{
 int i,j,k;

 for(i=1;i<=5;i++)
 {

 for(j=i-1;j>=1;j--)
 printf(" ");

 for(k=i;k<=5;k++)
 printf("%d",k);

 printf("\n");
 }

}
```

Topic 6: Functions

Program 1: Write a menu driven program to show various arithmetic operations using switch and functions.

```c

# include <stdio.h>

float add(float,float);
float multiply(float,float);
float subtract(float,float);
float divide(float,float);

main()
{
  float x,y; int n;

printf("Enter the no  1.Add   2. Multiply  3.Subtract   4.Divide\n");
scanf("%d",&n);

switch(n)
{
  case 1:
      scanf("%f %f",&x,&y);
      add(x,y);
      break;
  case 2:
      scanf("%f %f",&x,&y);
      multiply(x,y);
      break;
  case 3:
      scanf("%f %f",&x,&y);
      subtract(x,y);
      break;
  case 4:
      scanf("%f %f",&x,&y);
      divide(x,y);
      break;
  default:
      printf("Enter the valid Number");
      break;
}
}

float add(float a,float b)
{
  a=a+b;
  printf("%f",a);
}

float multiply(float a,float b)
{
  a=a*b;
  printf("%f",a);
}

float subtract(float a,float b)
{
  a=a-b;
  printf("%f",a);
}

float divide(float a,float b)
{
  a=a/b;
  printf("%f",a);
}

```

Program 2: WAP to find factorial of the number using functions.

```c

# include <stdio.h>

factorial(int);

main()
{
  int n;
  printf("Enter the Number");
  scanf("%d",&n);
  factorial(n);
}

factorial(int a)
{
  int i,f=1;
  for(i=1;i<=a;i++)
  f=f*i;
  printf("Factorial of %d is %d",a,f);
}
```

Program 3: WAP to show the table of the number using functions.

```c

# include <stdio.h>

table(int);

main()
{
  int n;
  printf("Enter the Number");
  scanf("%d",&n);
  table(n);
}

table(int a)
{
  int i,t=1;
  for(i=1;i<=10;i++)
  {
  t=a*i;
  printf(" %d x %d is %d\n",a,i,t);
}
}
```

Program 4: WAP to find whether a number is prime or not using functions.

```c

# include <stdio.h>

prime(int);

main()
{
  int n;
  printf("Enter the Number");
  scanf("%d",&n);
  prime(n);
}

prime(int a)
{
  int i,c=0;;
  for(i=1;i<=a;i++)
  if(a%i==0)
  c++;

  if(c==2)
  printf("Number is prime");
  else
  printf("Number is NON-prime");
}
```

Program 5: WAP to swap the value of two numbers using functions.

```c

# include <stdio.h>

swap(int,int);

main()
{
  int n,o;
  printf("Enter the Number\n");
  scanf("%d%d",&n,&o);
  swap(n,o);
}

swap(int a,int b) //Using two variable only
{
    a=a+b;
    b=a-b;
    a=a-b;

    printf("Swapped Number are %d and %d",a,b);
}
```

Program 6: WAP to display Fibonacci series using functions.

```c

# include <stdio.h>

fibonacci(int);

main()
{
  int n;
  printf("Enter the nth Number");
  scanf("%d",&n);
  fibonacci(n);
}

fibonacci(int a)
{
  int x=0,y=1,i,z;
  printf("Fibonacci series is %d %d ",x,y);
  for(i=3;i<=a;i++)
  {
  z=x+y;
  printf("%d ",z);
  x=y;
  y=z;
  }
}
```

Program 7: WAP to create functions with following prototype
int meter(int KM);
int feet(int KM);
int miles(int KM);
Ask user to enter value of distance in KM and converting it to meter, feet and miles using switch statement.

```c

# include <stdio.h>

int meter(int KM);
int feet(int KM);
int miles(int KM);

 main()
{
  int x,n;

printf("Kilometer to 1.Meter  2.Feet  3.Miles\n");
scanf("%d",&n);

switch(n)
{
  case 1:
      scanf("%d",&x);
      printf("%d km = ",x);
      meter(x);
      break;
  case 2:
      scanf("%d",&x);
      printf("%d km = ",x);
      feet(x);
      break;
  case 3:
      scanf("%d",&x);
      printf("%d km = ",x);
      break;
  case 3:
      scanf("%d",&x);
      printf("%d km = ",x);
      miles(x);
      break;
  default:
      printf("Enter the valid Number");
      break;
}
}

meter(int a)
{
  a=a*1000;
  printf("%d meter",a);
}

feet(int a)
{
  a=a*3280.84;
  printf("%d feet",a);
}

miles(int a)
{
  a=a*0.621371;
  printf("%d miles",a);
}
```

Program 8: WAP to make functions with prototype
void sum(int a,int b);
void mul(int a,int b);
void sub(int a,int b);
Ask user his choice which function he wants to execute.

```c

# include <stdio.h>

void sum(int a,int b);
void mul(int a,int b);
void sub(int a,int b);

main()
{
  int x,y; int n;

printf("Enter the no  1.Add   2. Multiply  3.Subtract\n");
scanf("%d",&n);

switch(n)
{
  case 1:
      scanf("%d %d",&x,&y);
      sum(x,y);
      break;
  case 2:
      scanf("%d %d",&x,&y);
      mul(x,y);
      break;
  case 3:
      scanf("%d %d",&x,&y);
      sub(x,y);
      break;
  default:
      printf("Enter the valid Number");
      break;
}
}

void sum(int a,int b)
{
  a=a+b;
  printf("%d",a);
}

void mul(int a,int b)
{
  a=a*b;
  printf("%d",a);
}

void sub(int a,int b)
{
  a=a-b;
  printf("%d",a);
}

```

Topic 7: Functions (call by value, call by reference)

Program 1: WAP to show the working of call by value and call by reference for sum of two numbers.

```c

# include <stdio.h>

sum(int,int);
add(int *,int *);

main()
{
  int a,b;
  printf("Enter the Numbers\n");
  scanf("%d %d",&a,&b);

  sum(a,b);
  add(&a,&b);
}

sum(int x,int y) // Call by Value
{
  x=x+y;
  printf("Sum is %d\n",x);
}

add(int *x,int *y) // Call by Reference
{
  x=*x+*y;
  printf("Sum is %d\n",x);
}
```

Program 2: WAP to calculate the sum of all the elements of an array using functions.

```c

# include <stdio.h>

sum(int x[]);
add(int *x);

main()
{
  int a[5],i;
  printf("Enter the 5 Numbers\n");
  for(i=0;i<5;i++)
  scanf("%d",&a[i]);

  sum(a);
  add(&a);
}

sum(int x[]) // Call by Value
{
  int s=0,i;
  for(i=0;i<5;i++)
  s=s+x[i];
  printf("Sum is %d\n",s);
}

add(int *x) // Call by Reference
{
  int s=0,i;
  for(i=0;i<5;i++)
  {
  s=s+*x;
  x++;
  }
  printf("Sum is %d\n",s);
}
```

Program 3: WAP to find the greatest and smallest from the elements of array using functions.

```c

# include <stdio.h>

small(int x[]);
large(int *x);

main()
{
  int a[5],i;
  printf("Enter the 5 Numbers\n");
  for(i=0;i<5;i++)
  scanf("%d",&a[i]);

  small(a);
  large(&a);
}

small(int x[]) // finding small by Call by Value
{
  int s=x[0],i;
  for(i=0;i<5;i++)
  if(x[i]<s)
  s=x[i];
  printf("Smallest is %d\n",s);
}
large(int *x) // finding large by Call by Reference
{
  int l=*x,i;
  for(i=0;i<5;i++)
  {
  if(*x>l)
  l=*x;
  x++;
  }
  printf("Largest is %d\n",l);
}
```

Program 4: WAP to calculate the sum of all elements of an array that are divisible by 5 and are even.

```c

# include <stdio.h>

sum(int x[]);

main()
{
  int a[5],i;
  printf("Enter the 5 Numbers\n");
  for(i=0;i<5;i++)
  scanf("%d",&a[i]);

  sum(a);
}

sum(int x[]) // Call by Value
{           //For Call by Reference do it by yourself.
  int s=0,i;
  for(i=0;i<5;i++)
  if((x[i]%5==0)&&(x[i]%2==0))
  s=s+x[i];
  printf("Sum is %d\n",s);
}

```

Program 5: WAP to swap the values of two variables using call by value and call by reference.

```c

# include <stdio.h>

swap(int,int);
swap1(int *,int *);

main()
{
  int a,b;
  printf("Enter the Numbers\n");
  scanf("%d %d",&a,&b);

  swap(a,b);
  swap1(&a,&b);
}

swap(int x,int y) // Call by Value
{
  x=x+y;
  y=x-y;
  x=x-y;
  printf("Swapped Number are %d and %d\n",x,y);
}
swap1(int *x,int *y) // Call by Reference
{
  *x=*x+*y;
  *y=*x-*y;
  *x=*x-*y;
  printf("Swapped Number are %d and %d",*x,*y);
}
```

Topic 8: Recursion

Program 1: WAP to print reverse of a number using recursion.

```c
#include <stdio.h>

int rev(int);

main()
{
    int r;
    printf("Enter the number");
    scanf("%d",&r);

    int g=rev(r);
    printf("%d",g);
}

int s=0;
rev(int n)
 {
 if(n!=0)
  {
  s=s*10+n%10;
  rev(n/10);
  }
  else
  return s;

 }
```

Program 2: WAP to find factorial using recursion.

```c


#include <stdio.h>

int fac(int);

main()
{
    int r;
    printf("Enter the number \n");
    scanf("%d",&r);

    int a=fac(r);
    printf("%d",a);
}

fac(int n)
{
  if(n==1)
  return 1;

  return(n*fac(n-1));
}
```

Program 3: WAP to display Fibonacci series using recursion.

```c
#include <stdio.h>

int fib(int);

main()
{
    int r;
    printf("Enter the number");
    scanf("%d",&r);

    fib(r-2);
}

int s=0,t=1,u;
printf ("Fibonacci series is %d %d",s,t);
 fib(int n)
 {
  if(n!=0)
  {
    u=s+t;
    printf("%d ",u);
    s=t;
    t=u;
    fib(--n);
  }
  else
  return 0;
 }
```

Program 4: WAP to find whether a number is prime or not using recursion.

```c
# include <stdio.h>

prime(int,int);

main()
{
  int n;
  printf("Enter the number");
  scanf("%d",&n);

  int c=prime(n,n);
  if(c==2)
  printf("Number is Prime");
  else
  printf("Number is not Prime",);
}

int c=0;
 prime(int x,int y)
{
  if(x==0)
  return c;
  else
  {
   if(y%x==0)
   c++;
   prime(--x,y);
  }
}
```

Program 5: WAP to find sum of series

$1^2+2^3+3^4+\ldots\ldots n^{n+1}$

```c
#include <stdio.h>

series(int);  pow(int,int);

main()
{
    int n;
    printf("Enter the number\n");
    scanf("%d",&n);

    int s=series(n);
    printf("%d",s);
}

pow(int x,int y)
{
    if(y==0)
    return 1;
    else
    return(x*pow(x,--y));
}

int s=0;
series(int x)
{
   if(x==0)
   return s;
   s=s+(pow(x,x+1));
   series(--x);
}
```

Program 6: WAP to find sum of series

$1^2-2^3+3^4-4^5.....n^{n+1}$

```c
#include <stdio.h>

series(int);
pow(int,int);

main()
{
    int n;
    printf("Enter the number\n");
    scanf("%d",&n);

    int s=series(n);
    printf("%d",s);

}

pow(int x,int y)
{
    if(y==0)
    return 1;
    else
    return(x*pow(x,--y));
}

int s=0;
series(int x)
{
   if(x==0)
   return s;
   if(x%2==0)
   s=s-(pow(x,x+1));
   else
   s=s+(pow(x,x+1));

   series(--x);
}
```

Program 7: WAP to find sum of all the digits of number and number can be of any length.

```c
#include <stdio.h>

long int digit(long int );

main()
{
    long int n;
    printf("Enter the number");
    scanf("%ld",&n);

    long int g=digit(n);
    printf("%ld",g);
}

long int s=0;
long int digit(long int n)
 {
 if(n!=0)
  {
  s=s+n%10;
  digit(n/10);
  }
  else
  return s;

 }
```

Topic : 9 1-Dimensional array

Program 1: WAP to store integer data in an array, and print the elements of the array.

```c
# include <stdio.h>

main()
{
    int n,i;

    printf("Enter the Size of Array\n");
    scanf("%d",&n);
    int a[n];

    printf("Enter the Elements\n");
    for(i=0;i<n;i++)
    scanf("%d",&a[i]);

    for(i=0;i<n;i++)
    printf("%d ",a[i]);

}
```

Program 2: WAP to find the sum of all elements of an array.

```c
# include <stdio.h>

main()
{
    int n,i,s=0;

    printf("Enter the Size of Array\n");
    scanf("%d",&n);
    int a[n];

    printf("Enter the Elements\n");
    for(i=0;i<n;i++)
    scanf("%d",&a[i]);

    for(i=0;i<n;i++)
    s=s+a[i];

    printf("Sum of Array Element is %d ",s);

}
```

Program 3: WAP to find the average of all elements of an array.

```c
# include <stdio.h>

main()
{
    int n,i,s=0;

    printf("Enter the Size of Array\n");
    scanf("%d",&n);
    int a[n];

    printf("Enter the Elements\n");
    for(i=0;i<n;i++)
    scanf("%d",&a[i]);

    for(i=0;i<n;i++)
    s=s+a[i];

    s=s/n;
    printf("Average of Array Element is %d ",s);

}
```

Program 4: WAP to find the greatest/maximum number in the array.

```c
# include <stdio.h>

main()
{
    int n,i,g=0;

    printf("Enter the Size of Array\n");
    scanf("%d",&n);
    int a[n];

    printf("Enter the Elements\n");
    for(i=0;i<n;i++)
    scanf("%d",&a[i]);

    g=a[0];
    for(i=0;i<n;i++)
    if(a[i]>g)
    g=a[i];

    printf("Largest Element in array is %d ",g);

}
```

Program 5: WAP to find the smallest/minimum number in the array.

```c
# include <stdio.h>

main()
{
    int n,i,s=0;

    printf("Enter the Size of Array\n");
    scanf("%d",&n);
    int a[n];

    printf("Enter the Elements\n");
    for(i=0;i<n;i++)
    scanf("%d",&a[i]);

    s=a[0];
    for(i=0;i<n;i++)
    if(a[i]<s)
    s=a[i];

    printf("Smallest Element in array is %d ",s);

}
```

Program 6: WAP to search a given element in an array using linear search.

```c
# include <stdio.h>

main()
{
    int n,i,s,c;

    printf("Enter the Size of Array\n");
    scanf("%d",&n);
    int a[n];

    printf("Enter the Elements\n");
    for(i=0;i<n;i++)
    scanf("%d",&a[i]);

    printf("Enter the Element you want to search\n");
    scanf("%d",&s);

    for(i=0;i<n;i++)
    if(a[i]==s)
    c=1;

    if(c==1)
    printf("Number Found");
    else
    printf("Number NOT Found");

}
```

Program 7: WAP to search a given element in an array using binary search.

```c
# include <stdio.h>

main()
{
    int n,i,s,c;

    printf("Enter the Size of Array\n");
    scanf("%d",&n);
    int a[n];

    printf("Enter the Sorted Array\n");
    for(i=0;i<n;i++)
    scanf("%d",&a[i]);

    printf("Enter the Element you want to search\n");
    scanf("%d",&s);

    int l=0,u=n,m;
    for(i=0;i<n;i++)
    {
      m=(l+u)/2;

      if(s>a[m])
        l=m;
      if(s<a[m])
        u=m;
      if(a[m]==s)
        c=1;
    }
    if(c==1)
    printf("Number Found");
    else
    printf("Number NOT Found");
}
```

Program 8: WAP to sort the elements of array using bubble sort.

```c
# include<stdio.h>

main()
{
  int n,i,j;
  printf("Enter the Size of Array \n");
  scanf("%d",&n);
  int a[n];

  printf("Enter the Element in Array \n");
  for(i=0;i<n;i++)
  scanf("%d",&a[i]);

  for(i=0;i<n;i++)
   {
  for(j=0;j<n-1;j++)
     {
      if(a[j]>a[j+1])
        {
         int s=a[j];
         a[j]=a[j+1];
         a[j+1]=s;
        }
      }
  }
    for(i=0;i<n;i++)
    printf("%d ",a[i]);
}
```

Program 9: WAP to search a given item in an array.

```c

# include <stdio.h>

main()
{
    int n,i,s,c;

    printf("Enter the Size of Array\n");
    scanf("%d",&n);
    int a[n];

    printf("Enter the Elements\n");
    for(i=0;i<n;i++)
    scanf("%d",&a[i]);

    printf("Enter the Element you want to search\n");
    scanf("%d",&s);

    for(i=0;i<n;i++)
    if(a[i]==s)
    {
      printf("Element Found at %d postion",i+1);
      break;
    }
}
```

Program 10: WAP to display the contents of the elements of array that are at odd/even positions.

```c

 # include<stdio.h>

 main()
 {
 int n,i;
 printf("Enter the Size of array\n");
 scanf("%d",&n);

 int a[n];
 printf("Enter the Element in Array \n");
 for(i=0;i<n;i++)
 scanf("%d",&a[i]);

 printf("Even Place elements are : ");
 for(i=0;i<n;i++)
 if(i%2==0)
 printf("%d ",a[i]);

 printf(" \n Odd Place elements are :");
 for(i=0;i<n;i++)
 if(i%2!=0)
 printf("%d ",a[i]);
 }
```

Program 11: WAP to enter 10 different numbers in an array, then adding the numbers that are divisible by 3 and displaying the result.

```c

# include <stdio.h>

main()
{
    int a[10]i,s=0;

    printf("Enter the Elements\n");
    for(i=0;i<10;i++)
    scanf("%d",&a[i]);

    for(i=0;i<10;i++)
    if(a[i]%3==0)
    s=s+a[i];
    printf("Sum of Number divisible by 3 is %d",s);

}
```

Program 12: WAP to store elements in array, insert a new element in array by asking user to enter location and number to be inserted. Display contents of array after insertion.

```c

# include <stdio.h>

main()
{
    int n,i,s,c;

    printf("Enter the Size of Array\n");
    scanf("%d",&n);
    int a[n];

    printf("Enter the Elements\n");
    for(i=0;i<n;i++)
    scanf("%d",&a[i]);

    printf("Enter the Positon at which element will be inserted\n");
    printf("Enter the Elements\n");
    scanf("%d %d",&s,&c);
    n=n+1;
    a[n];

    for(i=n-1;i>=s;i--)
    a[i]=a[i-1];

    a[s]=c;
    printf("Enter the Elements are\n");
    for(i=0;i<n;i++)
    printf("%d ",a[i]);

}
```

Program 13: WAP to delete any element from array and display content of array after deletion.

```c

# include <stdio.h>

main()
{
    int n,i,j,s;

    printf("Enter the Size of Array\n");
    scanf("%d",&n);
    int a[n];

    printf("Enter the Elements\n");
    for(i=0;i<n;i++)
    scanf("%d",&a[i]);

    printf("Enter the Elements you want to delete\n");
    scanf("%d",&s);
    n=n-1;
    a[n];

    for(i=0;i<n;i++)
    if(a[i]==s)
    for(j=i;j<n;j++)
    a[j]=a[j+1];

    printf("Enter the Elements are\n");
    for(i=0;i<n;i++)
    printf("%d ",a[i]);

}
```

Program 14: WAP to create 2 arrays of 1D. Enter data in them. Create third array and add the contents of 1st and 2nd array and store answer in 3rd array.

```c

 # include <stdio.h>

 main()
 {
     int n,i;

     printf("Enter the Size of Array\n");
     scanf("%d",&n);
     int a[n],b[n],c[n];

     printf("Enter the Elements in A \n");
     for(i=0;i<n;i++)
     scanf("%d",&a[i]);

     printf("Enter the Elements in B\n");
     for(i=0;i<n;i++)
     scanf("%d",&b[i]);

     for(i=0;i<n;i++)
     c[i]=a[i]+b[i];

     printf("Sum of Array Element in C is ");
     for(i=0;i<n;i++)
     printf("%d",c[i]);
 }
```

Program 15: WAP to create array for storing marks of 60 students and find

(a) Highest marks (b) Lowest marks

(c) Average marks. (d) Count how many students failed(marks<30).

```c
# include <stdio.h>

main()
{
    int a[60],i,g,s;

    printf("Enter the Elements\n");
    for(i=0;i<60;i++)
    scanf("%d",&a[i]);

    g=a[0];
    for(i=0;i<60;i++)
    if(a[i]>g)
    g=a[i];
    printf("Highest mark is %d\n",g);

    s=a[0];
    for(i=0;i<60;i++)
    if(a[i]<s)
    s=a[i];
    printf("Lowest mark is %d\n",s);

    for(i=0;i<60;i++)
    s=s+a[i];
    s=s/60;
    printf("Average Mark is is %d\n",s);

    g=0;
    for(i=0;i<60;i++)
    if(a[i]<30)
    g++;
    printf("Total student failed are %d\n",g);

}
```

Topic 10 2-Dimensional array

Program 1: WAP to add two matrices.

```c
# include <stdio.h>
main()
{
    int n,i,j;
    printf("Enter the Size of Array\n");
    scanf("%d",&n);
    int a[n][n],b[n][n],c[n][n];

    printf("Enter the Array A\n");
    for(i=0;i<n;i++)
    for(j=0;j<n;j++)
    scanf("%d",&a[i][j]);

    printf("Enter the Array B\n");
    for(i=0;i<n;i++)
    for(j=0;j<n;j++)
    scanf("%d",&b[i][j]);

    for(i=0;i<n;i++)
    for(j=0;j<n;j++)
    c[i][j]=a[i][j]+b[i][j];

    printf("Sum of Array is\n");
    for(i=0;i<n;i++)
    {
    for(j=0;j<n;j++)
    printf("%d ",c[i][j]);
    printf("\n");
    }
}
```

Program 2: WAP to multiply two matrices elements.

```c
# include <stdio.h>
main()
{
    int n,i,j;
    printf("Enter the Size of Array\n");
    scanf("%d",&n);
    int a[n][n],b[n][n],c[n][n];

    printf("Enter the Array A\n");
    for(i=0;i<n;i++)
    for(j=0;j<n;j++)
    scanf("%d",&a[i][j]);

    printf("Enter the Array B\n");
    for(i=0;i<n;i++)
    for(j=0;j<n;j++)
    scanf("%d",&b[i][j]);

    for(i=0;i<n;i++)
    for(j=0;j<n;j++)
    c[i][j]=a[i][j]*b[i][j];

    printf("Multiply of Array is\n");
    for(i=0;i<n;i++)
    {
    for(j=0;j<n;j++)
    printf("%d ",c[i][j]);
    printf("\n");
    }
}
```

Program 3: WAP to find the sum of diagonal elements of a square matrix.

```c

    # include<stdio.h>
    main()
    {
    int x,y,i,j,s=0;
    printf("Enter the Size of array \n");
    scanf("%d",&x);

    int a[x][x];
    printf("Enter the Element in Array \n");

    for(i=0;i<x;i++)
    for(j=0;j<x;j++)
    scanf("%d",&a[i][j]);

    for(i=0;i<x;i++)
    for(j=0;j<x;j++)
    if(i==j)
    s=s+a[i][j];
    printf(" Sum of Diagonal is : %d",s);
    }
```

Program 4: WAP to find the sum of opposite diagonal elements of a square matrix.

```c

    # include<stdio.h>
    main()
    {
    int x,i,j,s=0;
    printf("Enter the Size of Array\n");
    scanf("%d",&x);
    int a[x][x];

    printf("Enter the Element in Array \n");
    for(i=0;i<x;i++)
    for(j=0;j<x;j++)
    scanf("%d",&a[i][j]);

    for(i=0;i<x;i++)
    for(j=0;j<x;j++)
    if((i+j)==2)
    s=s+a[i][j];

    printf(" Sum of Opposite Diagonal is : %d",s);

    }
```

Program 5: WAP to find transpose of a matrix.

```c

    # include<stdio.h>
    main()
    {
    int x,i,j,s=0;
    printf("Enter the Size of Array\n");
    scanf("%d",&x);
    int a[x][x],b[x][x];

    printf("Enter the Element in Array \n");
    for(i=0;i<x;i++)
    for(j=0;j<x;j++)
    scanf("%d",&a[i][j]);

    for(i=0;i<x;i++)
    for(j=0;j<x;j++)
    b[j][i]=a[i][j];

    printf("Transpose of Array is\n");
    for(i=0;i<x;i++)
    {
    for(j=0;j<x;j++)
    printf("%d ",b[i][j]);
    printf("\n");
    }
}
```

Program 6: WAP to enter 3X3 array. Display the array in the form of a matrix.

```c

    # include <stdio.h>

    main()
    {
        int i,j,a[3][3];

        printf("Enter the Array A\n");
        for(i=0;i<3;i++)
        for(j=0;j<3;j++)
        scanf("%d",&a[i][j]);

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

Topic 11. Strings

Program 1: WAP to concatenate two strings.

```c

# include <stdio.h>
# include <string.h>
main()
{
    char a[100],b[100];
    gets(a);
    gets(b);

    strcat(a,b);
    printf("%s",a);

}
```

Program 2: WAP to compare two strings.

```c

# include <stdio.h>
# include <string.h>
main()
{
    char a[100],b[100];
    gets(a);
    gets(b);

    int i=strcmp(a,b);
    if(i==0)
    printf("String are same");
    else
    printf("String are NOT same");

}
```

Program 3: WAP to calculate length of the string.

```c

# include <stdio.h>
# include <string.h>
main()
{
    char a[100];
    gets(a);

    int l=strlen(a);
    printf("%d",l);

}
```

Program 4: WAP to copy a string.

```c

    # include <stdio.h>
    # include <string.h>
    main()
    {
        char a[100],b[100];
        gets(a);
        gets(b);

        strcpy(a,b);
        printf("%s",a);

    }
```

Program 5: WAP to convert a string from uppercase to lowercase letters.

```c

    # include <stdio.h>
    # include <string.h>
    main()
    {
        char a[100];
        gets(a);

        strlwr(a);
        printf("%s",a);

    }
```

Program 6: WAP to find whether a string is palindrome or not.

```c

    # include <stdio.h>
    # include <string.h>
    main()
    {
        char a[100],b[100];
        gets(a);

        strcpy(b,a);

        strrev(b);

        int i=strcmp(a,b);
        if(i==0)
        printf("String is Palindrome");
        else
        printf("String is Not Palindrome");
    }

```

Program 7: WAP to count vowels and consonants in string.

```c
# include <stdio.h>
# include <string.h>
main()
{
    char a[100]; int i,c=0,v=0;
    gets(a);
    int l=strlen(a);

    for(i=0;i<l;i++)
    if(a[i]=='a'||a[i]=='e'||a[i]=='i'||a[i]=='o'||a[i]=='u'||
       a[i]=='A'||a[i]=='E'||a[i]=='I'||a[i]=='O'||a[i]=='U')
       v++;
    else
       c++;

    printf(" Vowels are %d and Consonants are %d",v,c);

}
```

Program 8: WAP to find number of occurrences of “e” in a string, and replace “e” with “X”.

```c
# include <stdio.h>
# include <string.h>
main()
{
    char a[100]; int i,c=0;
    gets(a);
    int l=strlen(a);

    for(i=0;i<l;i++)
    if(a[i]=='e')
    {
       a[i]='x';
       c++;
    }
    printf(" %d times 'e' occur in string and new string is %s",c,a);

}
```

Program 9: WAP to concatenate two strings without using strcat.

```c
# include <stdio.h>
# include <string.h>
main()
{
    char a[100],b[100];
    gets(a);
    gets(b);
    int l=strlen(a);
    int l1=strlen(b);

    char c[l+l1];  int n=0,n1=0,i;

    for(i=0;i<(l+l1);i++)
    if(n<l)
    {
    c[i]=a[n];
    n++;
    }
    else if(n1<l1)
    {
    c[i]=b[n1];
    n1++;
    }
    printf("%s",c);

}
```

Program 10: WAP to compare two strings without using strcmp.

```c

# include <stdio.h>
# include <string.h>
main()
{
    char a[100],b[100];
    gets(a);
    gets(b);
    int l=strlen(a);
    int l1=strlen(b);

    int i,c=0;;

    if(l==l1)
    {
    for(i=0;i<l;i++)
    if(a[i]==b[i])
    c++;
    if(c==l)
    printf("String are same");
    else
    printf("String are NOT same");
    }
    else
    printf("String are NOT same");

}
```

Program 11: WAP to find length of string without using strlen.

```c

# include <stdio.h>
# include <string.h>
main()
{
    char a[100];
    gets(a);

    int i=0,c=0;
    while(a[i]!=NULL)
    {
        c++;
        i++;
    }
    printf("%d",c);

}
```

Program 12: WAP to reverse a string without using strrev.

```c


# include <stdio.h>
# include <string.h>
main()
{
    char a[100];
    gets(a);

    int l=strlen(a);

    int i,n=l; char s;
    for(i=0;i<l/2;i++)
    {
      --n;
    s=a[i];
    a[i]=a[n];
    a[n]=s;
    }

    printf("%s",a);
}
```

Program 13: WAP to count characters, spaces, words from a string.

```c

    # include <stdio.h>
    # include <string.h>
    main()
    {
        char a[100]; int i,s=0,w=1;
        gets(a);
        int l=strlen(a);

        for(i=0;i<l;i++)
        {
        if(a[i]!=' ')
        continue;
        else
        {
         s++;
         w++;
        }
        }
        printf("There are %d characters, %d Spaces and %d Words",l,s,w);

    }
```

Program 14: WAP to reverse a string and store it in other string without using strrev.

```c


    # include <stdio.h>
    # include <string.h>
    main()
    {
        char a[100];
        gets(a);

        int l=strlen(a);
        char b[l];

        int i,n=l;
        for(i=0;i<l;i++)
        b[i]=a[--n];

        printf("%s",b);
    }
```

Topic 12: Pointer

Program 1: WAP to find maximum element in array using pointer.

```c

# include <stdio.h>

main()
{
  int n,i;
  printf("Enter the size of array\n");
  scanf("%d",&n);
  int a[n];

  printf("Enter the elements\n");
  for(i=0;i<n;i++)
  scanf("%d",&a[i]);

  int *p=&a,l=a[0];

  for(i=0;i<n;i++)
  {
  if(*p>l)
   l=*p;

   p++;
  }

  printf("Largest Element is %d",l);
}
```

Program 2: WAP to search a character in string using pointer.

```c

# include <stdio.h>

main()
{
  int i,c=0;
  char a[100],n;
  gets(a);
  int l=strlen(a);

  printf("Enter the character you want to search\n");
  scanf("%c",&n);

  char *p=&a;

  for(i=0;i<l;i++)
  {
  if(*p==n)
  c=1;
  p++;
  }
  if(c==1)
  printf("Element Found");
  else
  printf("Element Not Found");

  }
```

Program 3: WAP to print address of a variable along with its value by using pointer.

```c

 # include <stdio.h>

 main()
 {
   int n,i;
   printf("Enter the size of array\n");
   scanf("%d",&n);
   int a[n];

   printf("Enter the elements\n");
   for(i=0;i<n;i++)
   scanf("%d",&a[i]);

   int *p=&a;

   for(i=0;i<n;i++)
   {
    printf(" %u is at %u\n",*p,p);
    p++;
   }

 }
```

Program 4: WAP to show accessing of array elements using pointers.

```c
# include <stdio.h>

main()
{
  int n,i;
  printf("Enter the size of array\n");
  scanf("%d",&n);
  int a[n];

  printf("Enter the elements\n");
  for(i=0;i<n;i++)
  scanf("%d",&a[i]);

  int *p=&a;

   printf("Element of array are ");
  for(i=0;i<n;i++)
  {
    printf("%u ",*p);
    p++;
  }
}
```

Program 5: WAP to show the use of pointers to compute the sum of all elements stored in array.

```c
# include <stdio.h>

main()
{
  int n,i;
  printf("Enter the size of array\n");
  scanf("%d",&n);
  int a[n];

  printf("Enter the elements\n");
  for(i=0;i<n;i++)
  scanf("%d",&a[i]);

  int *p=&a,s=0;

  for(i=0;i<n;i++)
  {
    s=s+*p;
    p++;
  }
  printf("Sum of Array is %d",s);

}
```

Program 6: WAP to ask user to enter a string find length of string using pointer.

```c
# include <stdio.h>

main()
{
 char a[100];
 gets(a);

  char *p=&a; int c=0;

    while(*p!=NULL)
    {
        c++;
        *p++;
    }
    printf("%d",c);

}
```

Program 7: WAP to ask user to create an array, enter values in it and add 2 in each element of array using pointer and display the array.

```c

# include <stdio.h>

main()
{
  int n,i;
  printf("Enter the size of array\n");
  scanf("%d",&n);
  int a[n];

  printf("Enter the elements\n");
  for(i=0;i<n;i++)
  scanf("%d",&a[i]);

  int *p=&a;

  for(i=0;i<n;i++)
  {
    *p=*p+2;
    p++;
  }

  for(i=0;i<n;i++)
  printf(" Array is %d\n",a[i]);
}
```

Program 8: WAP to enter a string and convert all small letter to capital letters using pointer.

```c

# include <stdio.h>

main()
{
 char a[100];
 gets(a);

  char *p=&a;

    while(*p!=NULL)
    {
     if(*p>=97&&*p<=122)
     *p=(char)((int)*p)-32;

     *p++;
    }
    printf("%s",a);

}
```