C

FUNDAMENTAL PROGRAMS

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/* 1. TO CALCULATE THE SUM OF TWO NUMBERS. */

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

void main()
{
int a,b,sum;
clrscr();
        printf("\n Enter value for 'a': ");
        scanf("%d",&a);
        printf("\n Enter value for 'b': ");
        scanf("%d",&b);
        sum = a+b;
        printf("\n Sum=%d",sum);
getch();
}
```

```
Enter value for 'a': 5

Enter value for 'b': 10

Sum=15
```

2. TO CALCULATE THE AREA OF A CIRCLE. */

```
#include<stdio.h>
#include<conio.h>
#define PI 3.14

void main()
{
int r;
float a;
clrscr();
        printf("\n ENTER THE RADIUS: ");
        scanf("%d",&r);

        a=PI*r*r;
        printf("\n AREA COMES TO BE: %f",a);
getch();
}
```

```
ENTER THE RADIUS: 5

AREA COMES TO BE: 78.500000
```

/* 3. PRINT OUT THE RESULTS USING getchar(). */

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

void main()
{
char ch;
clrscr();
        printf("\n Enter a character...\n ");
        ch=getchar();
        printf("\n Result is...\n %c",ch);
getch();
}
```

```
Enter a character...
s

Result is...
s
```

/* 4. TO PRINT THE OUTPUT USING putchar(). */

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

void main()
{
char ch='s';
clrscr();
        printf("\n Result is as...\n ");
        putchar(ch);
getch();
}
```

```
Result is as...
s
```

*** 5. TO USE gets() AND puts() TO ENTER AND PRINT YOUR NAME. */**

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

void main()
{
char ch[50];
clrscr();
        printf("\n Enter your name: ");
        gets(ch);
        printf("\n Result is as...\n ");
        puts(ch);
getch();
}
```

```
Enter your name: sandy

Result is as...
sandy
```

/* 6. TO PRINT THE VALUE OBTAINED BY VARIOUS OPERATORS. */

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

void main()
{
int a,b,c,d,e,f,g;
clrscr();
        printf("\n Enter value of 'a': ");
        scanf("%d",&a);
        printf("\n Enter value of 'b': ");
        scanf("%d",&b);

        c = a + b;
        d = a - b;
        e = a * b;
        f = a / b;
        g = a % b;

        printf("\n Result is as...");
        printf("\n %d \t %d \t %d \t %d \t %d",c,d,e,f,g);
getch();
}
```

```
Enter value of 'a': 10

Enter value of 'b': 5

Result is as...
15      5       50      2       0
```

*** 2. TO DETERMINE SIZE OF DATATYPES IN COMPUTER'S MEMORY. */**

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

void main()
{
int a;
float b;
char c;
double d;
clrscr();
        printf("\n Integer:%d",sizeof(a));
        printf("\n Float:%d",sizeof(b));
        printf("\n Character:%d",sizeof(c));
        printf("\n Double:%d",sizeof(d));
getch();
}
```

```
Integer:2
Float:4
Character:1
Double:8
```

/* 3. TO FIND GREATEST OF TWO NUMBERS USING CONDITIONAL OPERATOR. */

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

void main()
{
int a,b,c;
clrscr();
        printf("\n Enter value of 'a': ");
        scanf("%d",&a);
        printf("\n Enter value of 'b': ");
        scanf("%d",&b);

        c = (a>b) ? a:b;
        printf("\n The number %d is greater",c);
getch();
}
```

```
Enter value of 'a': 25
Enter value of 'b': 35
The number 35 is greater
```

*** 4. TO FIND GREATEST OF THREE NUMBERS USING CONDITIONAL OPERATOR. */**

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

void main()
{
int a,b,c,d;
clrscr();
        printf("\n Enter value of 'a': ");
        scanf("%d",&a);
        printf("\n Enter value of 'b': ");
        scanf("%d",&b);
        printf("\n Enter value of 'c': ");
        scanf("%d",&c);

        d = (a>b) ? ((a>c) ? a:c) : ((b>c) ? b:c);
        printf("\n The number %d is greater",d);
getch();
}
```

```
Enter value of 'a': 25
Enter value of 'b': 50
Enter value of 'c': 35
The number 50 is greater
```

/* 5. TO CONVERT TEMPERATURE IN DEGREE FAHRENHEIT TO DEGREE CELSIUS, USING FORMULA, C=(5/9)*(F-32). */

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

void main()
{
float c,f;
clrscr();
        printf("\n Enter temperature in Fahrenheit: ");
        scanf("%f",&f);

        c = (5.0/9.0) * (f-32.0);
        printf("\n Temperature in Celsius:%f",c);
getch();
}
```

```
Enter temperature in Fahrenheit: 101.50

Temperature in Celsius:38.611111
```

CONTROL STATEMENTS

/* 1. TO CHECK WHETHER THE NUMBER IS EVEN OR ODD. */

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

void main()
{
int n,m;
clrscr();
        printf("\n Enter a number: ");
        scanf("%d",&n);

        if((n%2) == 0)
          printf("\n Number is Even");
        else
          printf("\n Number is Odd");
getch();
}
```

```
Enter a number: 5

Number is Odd
```

/* 2. TO FIND GREATEST OF THREE NUMBERS USING NESTED-if STATEMENT. */

```
#include<stdio.h>
#include<conio.h>
void main()
{
int a,b,c;
clrscr();
        printf("\n Enter three numbers: ");
        scanf("%d,%d,%d",&a,&b,&c);
        if(a>b)
        {
          if(a>c)
            printf("\n %d is biggest",a);
          else
            printf("\n %d is biggest",c);
        }
        else
        {
          if(b>c)
            printf("\n %d is biggest",b);
          else
            printf("\n %d is biggest",c);
        }
getch();
}
```

```
Enter three numbers: 25,35,20

35 is biggest
```

/* 4. TO CALCULATE FACTORIAL OF A NUMBER. */

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

void main()
{
int n,i=1;
long int fact=1;
clrscr();
        printf("\n Enter a number: ");
        scanf("%d",&n);

        while(i<=n)
        {
         fact = fact * i;
         i++;
        }
        printf("\n Factorial is %ld",fact);
getch();
}
```

```
Enter a number: 5

Factorial is 120
```

/* 3. TO FND THE ROOTS OF QUADRATIC EQUATION : $ax^2 + bx + c = 0$. */

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

void main()
{
int a,b,c;
float x1,x2,d;
clrscr();
        printf("\n Enter values of a,b,c: ");
        scanf("%d,%d,%d",&a,&b,&c);

        d = (b*b) - (4*a*c);
        if(d==0)
        {
         x1 = x2 = (-b) / (2*a);
         printf("\n Roots are Equal and are x1=%f and x2=%f",x1,x2);
        }

        if(d<0)
        {
         printf("\n Roots are Imaginary");
        }

        if(d>0)
        {
         x1 = ((-b) + sqrt(d)) / (2*a);
         x2 = ((-b) - sqrt(d)) / (2*a);
         printf("\n Roots are...");
         printf("\n x1=%f",x1);
         printf("\n x2=%f",x2);
        }
getch();
}
```

```
Enter values of a,b,c: 1,4,2

Roots are...
x1=-0.585786
x2=-3.414214
```

/* 5. TO PRINT n NUMBER OF FIBONNICI SERIES. */

```
#include<stdio.h>
#include<conio.h>
void main()
{
int a=0,b=1,c,n;
clrscr();

        c=a+b;
        printf("\n  Enter any number for series: ");
        scanf("%d",&n);
        printf("\n The series starts as...");
        printf("\n %d\n %d\n %d",a,b,c);

        while (c<n)
        {
         a=b;
         b=c;
         c=a+b;
         printf("\n %d",c);
        }
getch();
}
```

```
Enter any number for series: 5

The series starts as...
0
1
1
2
3
5
```

*** 6. TO FIND H.C.F. OF TWO POSITIVE INTEGER NUMBERS. */**

```
void main()
{
int a,b,r=1,hcf;
        printf("\n Enter two numbers: ");          scanf("%d,%d",&a,&b);
        if(a>b)
        {
         while(r!=0)
         {
          r = a%b;            a = b;              b = r;
         }
         hcf = a;
        }
        else
        {
         while(r!=0)
         {
          r = b%a;            b = a;              a = r;
         }
         hcf = b;
        }
        printf("\n HCF is %d",hcf);          getch();
}
```

```
Enter two numbers: 56,18

HCF is 2
```

/* 7. TO CHECK WHETHER THE YEAR IS LEAP OR NOT. */

```
#include<stdio.h>
#include<conio.h>
void main()
{
int a;
clrscr();
        printf("\n Enter any year to check whether it is leap or not : ");
        scanf("%d",&a);
        if (a%4==0 && a/10!=0)
          printf("\n The given year is a leap year");
        else
          printf("\n The given year is not a leap year");
getch();
}
```

```
Enter any year to check whether it is leap or not : 2000

The given year is a leap year
```

/* 8. TO FIND SUM OF DIGITS OF A GIVEN NUMBER. */

```
#include<stdio.h>
#include<conio.h>
void main()
{
int n,m,sum=0;
clrscr();
        printf("\n Enter any number: ");
        scanf("%d",&n);
        while (n>0)
        {
         m = n%10;
         sum = sum+m;
         n = n/10;
        }
        printf("\n The sum of digits of given number is: %d",sum);
getch();
}
```

```
Enter any number: 123

The sum of digits of given number is: 6
```

/* 9. TO FIND REVERSE OF A GIVEN NUMBER. */

```
#include<stdio.h>
#include<conio.h>
void main()
{
int n,m;
clrscr();
        printf("\n Enter the any number for reversing: ");
        scanf("%d",&n);
        printf("\n Reversed number is as...");
        while(n>0)
        {
         m = n%10;
         n = n/10;
         printf("%d",m);
        }
getch();
}
```

```
Enter the any number for reversing: 123
Reversed number is as...321
```

/* 10. TO FIND WHETHER A GIVEN NUMBER IS PRIME OR NOT. */

```
#include<stdio.h>
#include<conio.h>
void main()
{
int n,a,b;
clrscr();
        printf("\n Enter a number: ");
        scanf("%d",&n);

        for (a=2;a<=n/2;a++)
        {
         if ((n%a)==0)
          b=0;
        }
        if(b!=0)
          printf("\n The number %d is prime",n);
        else
          printf("\n The number %d is not prime",n);
getch();
}
```

```
Enter a number: 19
The number 19 is prime
```

/* 11. TO PRINT FIRST n PRIME NUMBERS BETWEEN 1 AND 1000. */

```
#include<stdio.h>
#include<conio.h>
void main()
{
int x,n,i,j,count=0;
clrscr();
        printf("\n How many numbers: ");
        scanf("%d",&n);
        printf("\n List of Prime numbers is as...");

        for(i=2;i<=1000;i++)
        {
         x=0;
         for(j=2;j<=i/2;j++)
         {
          if((i%j)==0)
          {
           x=1;
           break;
          }
         }
         if(x==0)
         {
          count++;
          if(count<=n)
           printf("\n %d",i);
         }
        }
getch();
}
```

```
How many numbers: 10

List of Prime numbers is as...
2
3
5
7
11
13
17
19
23
29
```

/* 12. TO GENERATE THE LATIN SQUARE. */

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

void main()
{
int i,j,k=1,n;
clrscr();
        printf("\n Enter value of 'n' for Latin Square: ");
        scanf("%d",&n);

        for (i=1;i<=n;i++)
        {
         printf("\n");
```

```
        for (j=1;j<=n;j++)
        {
         printf(" %d",k);
         if (k==n)
          k=1;
         else
          k++;
        }
         k++;
       }
getch();
}
```

```
Enter value of 'n' for Latin Square: 4

1 2 3 4
2 3 4 1
3 4 1 2
4 1 2 3
```

/* 13. TO PRINT THE MULTIPICATION TABLE. */

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

void main()
{
int a,b,i;
clrscr();
printf("\n Enter a value for table: ");
scanf("%d",&a);
printf("\n limit table you want end: ");
scanf("%d",&b);
printf("\n Table of %d upto %d ",a,b);
for(i=1;i<=b;i++)
 printf("\n\t %d * %d = %d",a,i,a*i);
getch();
}
```

```
Enter a value for table: 10

Enter limit for table you want to end: 10

*** Table of 10 upto 10 ***

        10 * 1 = 10
        10 * 2 = 20
        10 * 3 = 30
        10 * 4 = 40
        10 * 5 = 50
        10 * 6 = 60
        10 * 7 = 70
        10 * 8 = 80
        10 * 9 = 90
        10 * 10 = 100
```

/* 14. TO PRINT THE FOLLOWING*/

```
void main()
{
int i,j,n;
clrscr();
        printf("\n Enter how many lines: ");
        scanf("%d",&n);

        for(i=0;i<n;i++)
        {
         for(j=0;j<=i;j++)
         {
          printf("* ");
         }
        }
getch();
}
```

```
 Enter how many lines: 5
*
* *
* * *
* * * *
* * * * *
```

/* 15. TO PRINT THE FOLLOWING:*/

```
#include<stdio.h>
#include<conio.h>
void main()
{
int i,j,k,n;
clrscr();
        printf("\n How many lines: ");
        scanf("%d",&n);

        for(i=1;i<=n;i++)
        {
         for(j=1;j<=(n-i);j++)
         {
          printf("  ");
         }
         for(k=1;k<=2*i-1;k++)
         {
          printf(" *");
         }
         printf("\n");
        }
getch();
}
```

```
How many lines: 5
        *
      * * *
    * * * * *
  * * * * * * *
* * * * * * * * *
```

/* 16. TO PRINT THE FOLLOWING:*/

```
#include<stdio.h>
void main()
{
int i,j,a,s,n;
clrscr();
        printf("\n How many lines: ");
        scanf("%d",&n);

        for (i=1;i<=n;i++)
        {
         a = i;
         s = n-1;
         for (j=1;j<=i;j++)
         {
          printf(" %d",a);
          a = a+s;
          s--;
         }
         printf("\n");
         s = n-1;
        }
getch();
}
```

```
How many lines: 5
1
2 6
3 7 10
4 8 11 13
5 9 12 14 15
```

/*. 17. TO PRINT THE FOLLOWING:*/

```
void main()
{
int i,j,n,a,b,k,h;
printf("\n Enter value of n: ");
scanf("%d",&n);
for(i=1;i<=n;i++)
{
 a = i;          b = 2*i-2;
 for(j=1;j<=2*(n-i);j++)
 {
  printf(" ");
 }
 for(k=1;k<=i;k++)
 {
  printf(" %d",a);
 a = a+1;
 }
 for(h=1;h<i;h++)
 {
  printf(" %d",b);
b--;
 }
}       getch();
}
```

```
Enter value of n: 5
        1
      2 3 2
    3 4 5 4 3
  4 5 6 7 6 5 4
5 6 7 8 9 8 7 6 5
```

/* 18. TO PRINT THE FOLLOWING:*/

```
void main()
{
int i,j,k,k1,m,n;
        printf("\n Enter number of levels: ");
        scanf("%d",&n);
        m=n;
        for(i=1;i<=n;i++)
        {
         for(k1=m;k1>i;k1--)
         {
          printf("  ");
         }
         for(k=i;k>=2;k--)
         {
          printf(" %d",k);
         }
         for(j=1;j<=i;j++)
         {
          printf(" %d",j);
         }      }
getch();
}
```

```
Enter number of levels: 5
        1
      2 1 2
    3 2 1 2 3
  4 3 2 1 2 3 4
5 4 3 2 1 2 3 4 5
```

/* 1. PROGRAM TO CALCULATE FACTORIAL OF A NUMBER USING FUNCTIONS & TO DEMONSTRATE THAT THERE IS NEED OF FUNCTION DECLARATION IF FUNCTION DEFINITION IS WRITTEN BEFORE main(). */

```
#include<stdio.h>
#include<conio.h>
int fact(int a)
{
int f=1,i;
        for (i=1;i<=a;i++)
        {
         f=f*i;
        }
        return(f);
}
void main()
{
int n,z;
clrscr();
        printf("\n Enter value of n : ");
        scanf("%d",&n);

        z = fact(n);
        printf("\n Factorial of %d is %d",n,z);
getch();
}
```

```
Enter value of n : 5

Factorial of 5 is 120
```

*** 2. TO PRINT FIBONNICI SERIES USING FUNCTIONS. */**

```
int fabonnic(int *q)
{
int a = 0,b = 1,c;
        c = a + b;
        printf("\n The series starts as..."); printf("\n %d\n %d\n %d",a,b,c);
        while(c < *q)
        {
         a = b;
         b = c;
         c = a + b;
         printf("\n %d",c);
        } }
void main()
{
int n,t;
clrscr();
        printf("\n Enter limit for
Fibonnici series: ");
        scanf("%d",&n);
        t = fabonnic(&n);
getch();
}
```

```
Enter limit for Fibonnici series: 21

The series starts as...
0
1
1
2
3
5
8
13
21
```

/* 3. TO DEMONSTRATE IMPORTANCE OF PASS BY VALUE. */

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

void func(int);

void main()
{
int a=3;
clrscr();
        printf("\n a=%d (from main, before calling)",a);
        func(a);
        printf("\n a=%d (from main, after calling)",a);
getch();
}

void func(int a)
{
        a = a + 6;
        printf("\n a=%d (from main, after modification)",a);
        return;
}
```

```
a=3 (from main, before calling)
a=9 (from main, after modification)
a=3 (from main, after calling)
```

/* 4. TO CALCULATE FACTORIAL OF A NUMBER USING RECURSION. */

```
#include<stdio.h>
#include<conio.h>
int fact(int a)
{
        if(a == 1)
         return 1;
        else
         return (a * fact(a-1));
}
void main()
{
int n,f;
clrscr();
        printf("\n Enter value of n : ");
        scanf("%d",&n);

        f = fact(n);
        printf("\n Factorial of %d is %d",n,f);
getch();
}
```

```
Enter value of n : 6

Factorial of 6 is 720
```

/* 5. PRINT THE FIBONNICI SERIES USING RECURSION. */

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

int fib(int m)
{
        if(m==1 || m==2)
         return(1);
        else
         return(fib(m-1) + fib(m-2));
}

void main()
{
int i,n;
clrscr();
        printf("\n Enter number of terms: ");
        scanf("%d",&n);
        printf("\n Fibonnici Series is as...\n");

        for(i=1;i<=n;i++)
        printf(" %d\n",fib(i));
getch();
}
```

```
Enter number of terms: 7

Fibonnici Series is as...
1
1
2
3
5
8
13
```

/* 1. TO DEMONSTRATE THE DIFFRENCE BETWEEN AUTOMATIC VARIABLES AND STATIC VARIABLES. */

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

void func()
{
auto int i=2;
        printf("\n %d",i);
        i = i+2;
}

void main()
{
clrscr();
        printf("\n In case of Automatic variables...");
        func();
        func();
getch();
}
```

```
In case of Automatic variables...
2
2
```

```
#include<stdio.h>
#include<conio.h>
void func()
{
static int i=2;
        printf("\n %d",i);
        i = i+2;
}
void main()
{
clrscr();
        printf("\n In case of Static variables...");
        func();
        func();
getch();
}
```

```
In case of Static variables...
2
4
```

/* 2. TO DEMONSTRATE THE DIFFRENCE BETWEEN EXTERNAL VARIABLES AND STATIC VARIABLES. */

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

extern int i=1;

int func1()
{
        i = i+2;
        return(i);
}
int func2()
{
        i = i+3;
        return(i);
}

void main()
{
clrscr();
        printf("\n In case of External variables...");
        printf("\n %d",i);
        printf("\n %d",func1()); /* (i.e. i(1)+2) */
        printf("\n %d",func2()); /* (i.e. i(3)+3) */
getch();
}
```

```
In case of External variables...
1
3
6
```

```
/* static variables*/
#include<stdio.h>
#include<conio.h>
int func1()
{
static int i;
        i = i+2;
        return(i);
}
int func2()
{
static int i;
        i = i+3;
        return(i);
}

void main()
{
static int i=1;
clrscr();
        printf("\n In case of Static variables...");
        printf("\n %d",i);
        printf("\n %d",func1()); /* (i.e. i(0)+2) */
        printf("\n %d",func2()); /* (i.e. i(0)+3) */
getch();
}
```

```
In case of Static variables...
1
2
3
```

```
/* 1. PROGRAM TO READ AND WRITE ELEMENTS IN AN ARRAY. */
void main()
{
int a[10],n,i;
clrscr();
printf("\n Enter number of elements in an array: ");
scanf("%d",&n);
printf("\n Enter Elements...\n");
for (i=0;i<n;i++)
{
scanf("%d",&a[i]);
        }
printf("\nYou have enterd following elements of an array...\n");
for(i=0;i<n;i++)
{
 printf("%d \n",a[i]);
}
getch();
}
```

```
 Enter number of elements in an array: 5

 Enter Elements...
23
42
21
35
78

 You have enterd following elements of an array...
23
42
21
35
78
```

/* 2. TO CALCULATE SUM AND AVERAGE OF ELEMENTS IN AN ARRAY. */

```
void main()
{
int a[10],n,i,sum=0;
float average;
clrscr();
        printf("\n Enter number of elements in an array ??? ");
        scanf("%d",&n);

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

        for (i=0;i<n;i++)
        {
         sum = sum+a[i];
        }
        printf("\n Sum of elements in an array is %d",sum);

        average = (float)sum/(float)n;
        printf("\n Average of elements in an array is %f",average);
getch();
}
```

```
Enter number of elements in an array ??? 5

Enter elements...
23
54
23
35
67

Sum of elements in an array is 202
Average of elements in an array is 40.400002
```

/* 3. TO SEARCH A GIVEN NUMBER FROM A GIVEN LIST OF NUMBERS USING 'LINEAR SEARCH'. */

```
#include<stdio.h>
#include<conio.h>
#include<process.h>
#include<dos.h>

void main()
{
int a[20],i,n,item,loc,count=0;
clrscr();
        printf("\n Enter how many elements: ");
        scanf("%d",&n);
        if (n>10)
        {
         printf("\n Your length is out of range of
an array....Again run program to execute");
         sleep(3);
         exit(1);
        }
        for (i=0;i<n;i++)
        {
```

```
Enter how many elements: 4
Enter Element 1: 34
Enter Element 2: 21
Enter Element 3: 65
Enter Element 4: 45

Enter item to be searched: 21

21 is present at location 1
The number is present 1 times
```

```
        printf(" Enter Element %d: ",i+1);
        scanf("%d",&a[i]);
       }

       printf("\n Enter item to be searched: ");
       scanf("%d",&item);
       for (i=0;i<n;i++)
       {
        if(a[i] == item)
        {
         loc = i;
         printf("\n %d is present at location %d",item,loc);
         count++;
        }
       }
        if(count != 0)
        {
 printf("\nno is present %d times",count);
        }
        else
         printf("\n Item is not present");
getch();
}
```

/* 4. TO SEARCH A GIVEN ELEMENT FROM A GIVEN LIST OF NUMBERS USING 'BINARY SEARCH'. */

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

void main()
{
int a[20],i,beg,end,mid,n,search,loc=-1;
clrscr();
       printf("\n Enter number of elements in an array: ");
       scanf("%d",&n);

       printf("\n Enter sorted elements...\n");
       for (i=0;i<n;i++)
       {
        printf(" Enter Element %d: ",i+1);
        scanf("%d",&a[i]);
       }

       printf("\n Enter element you want to search : ");
       scanf("%d",&search);
       beg = 0;
       end = n-1;
```

```
        while(beg < end)
        {
         mid = (beg+end)/2;
         if(a[mid] == search)
         {
          loc = mid;
          printf("\n Element is found at %d location",loc);
          break;
         }
         else if(a[mid] > search)
          end = mid-1;
         else
          beg = mid+1;
         }
        if(loc == -1)
 printf("\n Element is not found");
getch();
}
```

```
Enter number of elements in an array: 5

Enter sorted elements...
Enter Element 1: 23
Enter Element 2: 12
Enter Element 3: 46
Enter Element 4: 25
Enter Element 5: 68

Enter element you want to search : 46

Element is found at 2 location
```

/* 5. TO SORT A GIVEN LIST OF NUMBERS USING 'BUBBLE SORT'. */

```
void main()
{
int a[20],i,j,temp,n;
        printf("\n Enter number of elements: ");
        scanf("%d",&n);
        printf("\n Enter elements...\n");
        for(i=0;i<n;i++)
        {
         scanf("%d",&a[i]);
        }
        for(i=0;i<n;i++)
        {
         for(j=0;j<n;j++)
         {
          if(a[j] > a[j+1])
           {
             temp = a[j];
             a[j] = a[j+1];
             a[j+1] = temp;
           }
         }
        }

        printf("\n The sorted elements are as...\n");
        for(i=0;i<n;i++)
         printf("%d\t",a[i]);
getch();
}
```

```
 Enter number of elements: 5

 Enter elements...
23
54
22
76
69

 The sorted elements are as...
22      23      54      69      76
```

/* 6. TO DELETE A GIVEN ELEMENT d FROM THE kth POSITION OF AN ARRAY. */

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

void main()
{
int a[20],i,n,k,d,item,loc;
clrscr();
        printf("\n Enter number of elements: ");
        scanf("%d",&n);

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

        printf("\n Element to be deleted: ");
        scanf("%d",&d);
        for(k=0;k<n;k++)
        {
         if(a[k] == d)
         loc = k;
        }
        for(i=loc;i<=n-1;i++)
         a[i] = a[i+1];

        n = n-1;
        printf("\n The New Array is as...\n");
        for(i=0;i<n;i++)
         printf("%d\t",a[i]);
getch();
}
```

```
 Enter number of elements: 5

 Enter elements...
12
32
56
24
68

 Element to be deleted: 56

 The New Array is as...
12      32      24      68
```

/* 7. TO INSERT AN ELEMENT IN UNSORTED LIST. */

```
void main()
{
int a[20],i,j,n,item,loc;
clrscr();
        printf("\n Enter number of elements: ");
        scanf("%d",&n);
        printf("\n Enter elements...\n");
        for(i=0;i<n;i++)
         scanf("%d",&a[i]);
        printf("\n Enter location: ");
        scanf("%d",&loc);
        printf("\n Enter element to be insert: ");
        scanf("%d",&item);
```

```
        for(j=n-1;j>=loc;j--)
        {
         a[j+1] = a[j];
        }
        a[loc] = item;
        n = n+1;
        printf("\n The New Array is as...");
        for(i=0;i<n;i++)
         printf("\n %d",a[i]);
getch();
}
```

```
 Enter number of elements: 4

 Enter elements...
23
53
13
68

 Enter location: 2

 Enter element to be insert: 55

 The New Array is as...
23
53
55
13
68
```

/* 8. TO FIND MAXIMUM AND MINIMUM ELEMENTS IN AN ARRAY. */

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

void main()
{
int a[20],i,n,max,min;
clrscr();
        printf("\n Enter number of elements: ");
        scanf("%d",&n);

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

        max = a[0];
        for(i=0;i<n;i++)
        {
         if(max<a[i])
         {
          max = a[i];
         }
        }
        printf("\n Maximum element in given array is %d",max);

        min = a[0];
        for(i=0;i<n;i++)
        {
         if(min>a[i])
         {
          min = a[i];
         }
        }
        printf("\n Minimum element in given array is %d",min);
getch();
}
```

```
 Enter number of elements: 5

 Enter 5 elements...
23
4
34
76
23

 Maximum element in given array is 76
 Minimum element in given array is 4
```

/* 9. PROGRAM TO READ AND WRITE ELEMENTS OF TWO DIMENSIONAL ARRAY i.e. MATRIX. */

```
#include <stdio.h>
#include <conio.h>
#include <dos.h>
#include <process.h>

void main()
{
int a[10][10],i,j,m,n;
clrscr();
        printf("\n Enter array length row by coloum : ");
        scanf("%d,%d",&n,&m);

        if((n > 10) || (m > 10))
        {
         printf("\n Input array is more than declared \n");
         sleep(3);
         exit(1);
        }

        printf("\n Enter elements row-wise...\n");
        for(i=0;i<n;i++)
         for(j=0;j<m;j++)
          scanf("%d",&a[i][j]);

        printf("\n Elements entered by you are (in form of matrix) : \n");
        for(i=0;i<n;i++)
        {
         for(j=0;j<m;j++)
          printf("\t%d",a[i][j]);
          printf("\n");
        }
getch();
}
```

```
Enter array length row by coloum : 2,2

Enter elements row-wise...
1 2
4 5

Elements entered by you are (in form of matrix) :
        1       2
        4       5
```

/* 10. TO CALCULATE SUM OF TWO MATRIX. */

```
#include<stdio.h>     #include<conio.h>#include<process.h>   #include<dos.h>
void main()
{
int a[10][10],b[10][10],s[10][10];
int i,j,r1,c1,r2,c2;
        printf("\n Enter no. of elements for MATRIX:A Row by Column: ");
        scanf("%d,%d",&r1,&c1);
        printf("\n Enter no. of elements for MATRIX:B Row by Column: ");
        scanf("%d,%d",&r2,&c2);
```

```
        if((r1 > 10) || (c1 > 10) || (r2>10) || (c2>10))
        {
 printf("\n  ENTERED NO. MORE THAN DECLARED");
sleep(1);      exit(1);
        }
        if((r1 != r2) || (c1 != c2))
        {
 printf("\n ADDITION OF MATRIX IS NOT FEASIBLE");      sleep(1);   exit(1);
        }

        printf("\n Enter elements for MATRIX-A by ROW WISE:\n");
        for(i=0; i<r1; i++)         {
         for(j=0; j<c1; j++)
         {
          scanf(" %d",&a[i][j]);
         }
        }
        printf("\n Enter elements for MATRIX-B by ROW WISEE:\n");
        for(i=0; i<r1; i++)         {
        for(j=0; j<c1; j++)
         {
          scanf(" %d",&b[i][j]);
         }
        }
        printf("\n Sum of Two Matrix is as...\n");
        for(i=0; i<r1; i++)
        {
         for(j=0; j<c1; j++)
         {
          s[i][j] = a[i][j] + b[i][j];
         }
        }

        for(i=0; i<r1; i++)         {
        for(j=0; j<c1; j++)
         {
          printf("\t%d",s[i][j]);
         }
        }
getch();
}
```

```
 Enter no. of elements for MATRIX:A Row by Column: 2,2

 Enter no. of elements for MATRIX:B Row by Column: 2,2

 Enter elements for MATRIX-A by ROW WISE:
1 2
4 5

 Enter elements for MATRIX-B by ROW WISEE:
5 6
7 8

 Sum of Two Matrix is as...
        6       8
        11      13
```

/* 11. TO CALCULATE PRODUCT OF TWO MATRIX. */

```
#include <stdio.h>  #include <conio.h>  #include <dos.h>  #include <process.h>
void main()
{
int a[10][10],b[10][10],c[10][10];  int i,j,r1,c1,r2,c2,k;
clrscr();
printf("\n Enter length of Marix-A Row by Coloum: ");  scanf("%d,%d",&r1,&c1);
printf("\n Enter length of Marix-B Row by Coloum: ");  scanf("%d,%d",&r2,&c2);
        if ((r1 > 10) || (c1 > 10) || (r2>10) || (c2>10))
        {
 printf("\n Input array is more than declared \n");  sleep(2);  exit(1);
        }

        if (c1 != r2)
        {
         printf("\n Matrix Multiplication is not feasible\n");
         sleep(2);
         exit(1);
        }

        printf("\n Enter elements of Matrix-A Row-wise...\n");
        for(i=0;i<r1;i++)
         for(j=0;j<c1;j++)  scanf("%d",&a[i][j]);

        printf("\n Enter elements of Matrix-B Row-wise...\n");
        for(i=0;i<r2;i++)
         for(j=0;j<c2;j++)  scanf("%d",&b[i][j]);

        printf("\n Product of Two Matrix is as...\n");
        for(i=0;i<r1;i++)
        {
         for(j=0;j<c2;j++)
         {
          c[i][j]  = 0;
          for(k=0;k<r2;k++)
           c[i][j] += (a[i][k]*b[k][j]);
         }
        }
        for(i=0;i<r1;i++)
        {
        for(j=0;j<c2;j++)
         printf("%d ",c[i][j]);
         printf("\n");
        }
getch();
}
```

```
 Enter length of Marix-A Row by Coloum: 2,3

 Enter length of Marix-B Row by Coloum: 3,2

 Enter elements of Matrix-A Row-wise...
1 2 3
4 5 6

 Enter elements of Matrix-B Row-wise...
1 2
3 4
5 6

 Product of Two Matrix is as...
22 28
49 64
```

/* 12. TO FIND TRANSPOSE OF A MATRIX. */

```
#include <stdio.h>
#include <conio.h>
#include <dos.h>
#include <process.h>

void main()
{
int a[10][10],b[10][10];
int i,j,r1,c1;
clrscr();
        printf("\n Enter length of Marix-A Row by Column: ");
        scanf("%d,%d",&r1,&c1);

        if((r1>10) || (c1>10))
        {
         printf("\n Input length is more than declared \n");
         sleep(2);
         exit(1);
        }

        printf("\n Enter elements of Matrix-A Row-wise...\n");
        for(i=0;i<r1;i++)
         for(j=0;j<c1;j++)
          scanf("%d",&a[i][j]);

        printf("\n Transpose of Matrix is as...\n");
        for(j=0;j<c1;j++)
        {
         for(i=0;i<r1;i++)
         {
          b[j][i] = a[i][j];
          printf("%d ",b[j][i]);
         }
         printf("\n");
        }
getch();
}
```

/* 13. TO CALCULATE SUM OF DIAGONAL ELEMENTS OF A MATRIX. */

```
#include <stdio.h>
#include <conio.h>
#include <dos.h>
#include <process.h>

void main()
{
int a[10][10],sum=0;
int i,j,r1,c1;
clrscr();
        printf("\n Enter length of Marix A row by coloum : ");
        scanf("%d,%d",&r1,&c1);

        if((r1>10) || (c1>10))
        {
         printf("\n Input length is more than declared \n");
         sleep(2);
         exit(1);
        }

        printf("\n Enter elements of Matrix- A Row-wise...\n");
        for(i=0;i<r1;i++)
         for(j=0;j<c1;j++)
          scanf("%d",&a[i][j]);

        for(i=0;i<r1;i++)
        {
         for(j=0;j<c1;j++)
         {
          if(i == j)
           sum += a[i][j];
         }
        }
        printf("\n Sum of Diagnol elements of Matrix is : %d ",sum);
getch();
}
```

/* 14. TO CALCULATE SUM OF ANTI-DIAGONAL ELEMENTS OF A MATRIX. */

```
#include <stdio.h>
#include <conio.h>
#include <dos.h>
#include <process.h>

void main()
{
int a[10][10],sum=0;
int i,j,r1,c1;
clrscr();
        printf("\n Enter length of Marix A row by coloum : ");
        scanf("%d,%d",&r1,&c1);

        if((r1>10) || (c1>10))
        {
         printf("\n Input length is more than declared \n");
         sleep(2);
         exit(1);
        }

        printf("\n Enter elements of Matrix- A Row-wise...\n");
        for(i=0;i<r1;i++)
         for(j=0;j<c1;j++)
          scanf("%d",&a[i][j]);

        for(i=0;i<r1;i++)
        {
         for(j=0;j<c1;j++)
         {
          if((i+j) == (r1-1))
           sum += a[i][j];
         }
        }
        printf("\n Sum of Anti-Diagnol elements of Matrix is : %d ",sum);
getch();
}
```

/* 15. TO CALCULATE SUM OF UPPER TRIANGLE AND LOWER TRIANGLE ELEMENTS OF A MATRIX. */

```
#include <stdio.h>      #include <conio.h>      #include <dos.h>        #include
<process.h>
void main()
{
int a[10][10],sum1=0,sum2=0;      int i,j,r1,c1;
printf("\n Order of Square Matrix Row by Column: ");
        scanf("%d,%d",&r1,&c1);

        if((r1>10) || (c1>10))
        {
         printf("\n Input length is more than declared \n");
         sleep(2);
         exit(1);
        }
        if(r1 != c1)
        {
         printf("\n Not a Square Matrix");
         sleep(2);
         exit(1);
        }

        printf("\n Enter elements Matrix Row-wise...\n");
        for(i=0;i<r1;i++)            for(j=0;j<c1;j++)
          scanf("%d",&a[i][j]);

        for(i=0;i<r1;i++)
        {
         for(j=0;j<c1;j++)
         {
          if(i < j)                sum1 += a[i][j];
         }
        }
        printf("\n Sum of Upper Triangle elements of Matrix is : %d ",sum1);

        for(i=0;i<r1;i++)
        {
         for(j=0;j<c1;j++)
         {
          if(i > j)
            sum2 += a[i][j];
         }
        }
        printf("\n Sum of Lower Triangle elements of Matrix is : %d ",sum2);
getch();
}
```

/* 1. PROGRAM TO PRINT YOUR NAME USING scanf(). */

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

void main()
{
char name[20];
clrscr();
        printf("\n Enter your name: ");
        scanf("%s",name);
        printf("\n %s",name);
getch();
}
```

/* 2. PROGRAM TO ENTER YOUR NAME USING gets(). */

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

void main()
{
char name[20];
clrscr();
        printf("\n Enter your name: ");
        gets(name);
        puts(name);
getch();
}
```

/* 3. TO CALCULATE THE LENGTH OF A STRING USING LIBRARY FUNCTION strlen(). */

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

void main()
{
char s[50];
int z;
clrscr();
        printf("\n Enter a string: ");
        gets(s);
        z = strlen(s);
        printf("\n Length of given string : %d",z);
getch();
}
```

/* TO CALCULATE THE LENGTH OF A STRING WITHOUT USING LIBRARY FUNCTION. */

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

void main()
{
char a[20];
int i,len=0;;
clrscr();
        printf("\n Enter a string : ");
        gets(a);

        for(i=0;a[i]!='\0';i++)
        {
         len++;
        }

        printf("\n Length of string is: %d",len);
getch();
}
```

/* 4. TO COPY A STRING TO ANOTHER USING LIBRARY FUNCTION strcpy(). */

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

void main()
{
char a[50],b[50];
clrscr();
        printf("\n Enter a string: ");
        gets(a);
        strcpy(b,a);
        printf("\n String after copying: ");
        puts(b);
        printf("\n String before copying: ");
        puts(a);
getch();
}
```

/* TO COPY A STRING TO ANOTHER WITHOUT USING LIBRARY FUNCTION. */

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

void main()
{
char a[20],b[20];
int i;
clrscr();
        printf("\n Enter a string : ");
        gets(a);

        for(i=0;a[i]!='\0';i++)
        {
         b[i] = a[i];
        }
         b[i] = '\0';

        printf("\n String after copying is: %s",b);
getch();
}
```

/* 5. TO REVERSE A GIVEN STRING USING LIBRARY FUNCTION strrev(). */

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

void main()
{
char a[50];
clrscr();
        printf("\n Enter a string: ");
        gets(a);
        printf("\n String before reversed:%s",a);
        printf("\n String after reversing:%s",strrev(a));
getch();
}
```

/* TO REVERSE A GIVEN STRING WITHOUT USING LIBRARY FUNCTION. */

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

void main()
{
char a[20],b[20];
int i,j,len=0;
clrscr();
        printf("\n Enter a string : ");
        gets(a);

        for(i=0;a[i]!='\0';i++)
         len++;

        for(i=(len-1),j=0;i>=0;i--,j++)
        {
         b[j] = a[i];
        }
         b[j] = '\0';

        printf("\n Reversed string is: %s",b);
getch();
}
```

/* 6. TO CONCATENATE TWO STRINGS USING LIBRARY FUNCTION strcat(). */

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

void main()
{
char a[20],b[20];
clrscr();
        printf("\n Enter first string : ");
        gets(a);
        printf("\n Enter second string : ");
        gets(b);
        strcat(a," ");
        strcat(a,b);
        printf("\n Concatenated string is: %s",a);
getch();
}
```

**/* TO CONCATENATE TWO STRINGS WITHOUT USING LIBRARY FUNCTION.
*/**

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

void main()
{
char a[20],b[20],c[20];
int i,j,len=0;
clrscr();
        printf("\n Enter a first string : ");
        gets(a);
        printf("\n Enter a second string : ");
        gets(b);

        for(i=0;a[i]!='\0';i++)
         len++;

        for(j=len,i=0;a[i]!='\0';j++,i++)
        {
         a[j] = b[i];
        }
         a[j] = '\0';

        printf("\n Concatenated string is: %s",a);
getch();
}
```

/* 7. TO COMPARE TWO STRINGS AND PRINT THE LOCATIONS OF THE UNMATCHED CHARACTER AND TOTAL NUMBER OF MATCHED CHARACTER. */

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

void main()
{
char a[20],b[20],count=0,loc;
int l1,l2,end,i,n;
clrscr();
        printf("\n Enter first string: ");
        scanf("%s",a);
        printf("\n Enter second string: ");
        scanf("%s",b);

        l1 = strlen(a);
        l2 = strlen(b);

        if(l1 > l2)
         end = l1;
        else
         end = l2;

        for(i=0;i<end;i++)
         if(a[i] == b[i])
         {
          count++;
          continue;
         }
         else
         {
          loc = i;
          printf("\n Unmatched location: %d",loc+1);
         }
        printf("\n\n Matches is %d out of %d",count,end);
getch();
}
```

/* 8. TO CHECK A GIVEN STRING IS PALINDROME USING 'COMMA' OPERATOR IN 'FOR' LOOP. */

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

void main()
{
char a[20];
int len=0,i,j,flag=0;
clrscr();
        printf("\n Enter a string : ");
        scanf("%s",a);

        for(i=0;a[i]!='\0';i++)
         len++;

        for(i=0,j=(len-1);i<=1/2;i++,j--)
        {
         if(a[i] == a[j])
          continue;
         else
          flag = 1;
        }

        if(flag == 1)
         printf("\n String is not Palindrome");
        else
         printf("\n String is Palindrome");
getch();
}
```

/* 9. PROGRAM TO FIND VOWELS, BLANK SPACES AND CHARACTERS IN A STRING. */

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

void main()
{
char a[1000],u;
int i,j,k,x,y;
clrscr();
        i = j = k = 0;
        while(1)
        {
         printf("\n Enter any string : ");
         gets(a);

         strlwr(a);

         while(a[i] != '\0')
         {
          if(a[i] == ' ')
           j++;

          if ( (a[i] == 'a') || (a[i] == 'e') || (a[i] == 'i') || (a[i] == 'o') || (a[i] == 'u') )
           k++;

          i++;
         }
        printf("\n Total Vowels in a string are : %d",k);
        printf("\n Total Blank Spaces in a string are : %d",j);
        printf("\n Total Characters in a string are : %d",i);

        printf("\n\n Want to input more (y/n) : ");
        u = getch();
         if(u == 'n')
         {
          printf("\n\n Press any key to continue.....");
          getch();
          exit(1);
         }
        }
getch();
}
```

```
/* 10. TO PRINT THE FOLLOWING:
       abcde
       bcdea
       cdeab
       deabc
       eabcd
*/

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

void main()
{
char a[20],temp;
int i,j,n;
clrscr();
       printf("\n Enter the string: ");
       gets(a);
       n = strlen(a);
       puts(a);

       for(i=0;i<n-1;i++)
       {
        temp= a[0];
        for(j=0;j<n-1;j++)
        {
         a[j] = a[j+1];
        }
        a[n-1] = temp;
        puts(a);
       }
getch();
}
```

POINTERS

/* 1. TO DETERMINE ADDRESS OF i,j. */

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

void main()
{
int i=10,j=20;
clrscr();
        printf("\n Values : %d\t %d",i,j);
        printf("\n Address : %u\t %u",&i,&j);
getch();
}
```

/* 2. TO PRINT THE VALUES OF VARIABLES USING POINTER VARIABLES. */

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

int a=5;
float i=10.5;
int *b;
float *j;
void main()
{
clrscr();
        printf("\n\n a=%d\n i=%f",a,i);
        printf("\n &a=%u\n &i=%u",&a,&i);
        b = &a;
        j = &i;
        printf("\n\n b=%u\n j=%u",b,j);
        printf("\n *b=%d\n *j=%f",*b,*j);
getch();
}
```

/* 3. TO SHOW DIFFERENCE BETWEEN CALL BY VALUE AND CALL BY REFERENCE. */

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

void main()
{
int a=1,b=2;
void value(int a, int b);
void refer(int *x, int *y);
clrscr();
        printf("\n Before Calling Value : a=%d \t b=%d",a,b);
        value(a,b);
        printf("\n After Calling Value : a=%d \t b=%d",a,b);
        printf("\n Before Calling Refer : a=%d \t b=%d",a,b);
        refer(&a,&b);
        printf("\n After Calling Refere : a=%d \t b=%d",a,b);
getch();
}

void value(int a, int b)
{
 a = 5;
 b = 10;
        printf("\n Value with Function : a=%d \t b=%d",a,b);
}
void refer(int *x, int *y)
{
 *x = 5;
 *y = 10;
        printf("\n Value with Function : *x=%d \t *y=%d",*x,*y);
}
```

/* 4. TO FIND FACTORIAL OF A NUMBER USING FUNCTIONS AND POINTERS. */

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

void fact(long int *p, long int *t)
{
int i;
        for(i=1;i<=*p;i++)
        {
         *t = *t * i;
        }
}

void main()
{
long int n,t=1;
clrscr();
        printf("\n Enter a number for Factorial: ");
        scanf("%ld",&n);

        fact(&n,&t);
        printf("\n Factorial of %ld number is %ld",n,t);
getch();
}
```

/* 5. TO INTERCHANGE TWO VALUES USING FUNCTION & POINTER. */

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

void change(int *a, int *b)
{
   int *c;
   *c = *a;
   *a = *b;
   *b = *c;
}

void main(void)
{
int a,b;
clrscr();
        printf("\n Enter the values of a,b:- ");
        scanf("%d,%d",&a,&b);
        change(&a,&b);
        printf("\n\n After interchanging, the new values are:- a=%d, b=%d",a,b);
getch();
}
```

STRUCTURES & UNIONS

/* 1. PROGRAM TO READ AND WRITE THE STRUCTURE. */

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

struct student
{
 char a[100];
 float chem;
 float math;
 float phy;
};

void main(void)
{
struct student s;
clrscr();
        printf("\n Enter the name of student : ");
        gets(s.a);
        printf(" Enter Marks in Chemistry : ");
        scanf("%f",&s.chem);
        printf(" Enter Marks in Mathematics : ");
        scanf("%f",&s.math);
        printf(" Enter Marks in Physics : ");
        scanf("%f",&s.phy);

        printf("\n The Result is as...\n");
        printf("\n Name of student : ");
        puts(s.a);
        printf(" Marks in Chemistry : %f",s.chem);
        printf("\n Marks in Mathematics : %f",s.math);
        printf("\n Marks in Physics : %f",s.phy);

        printf("\n\n Average Marks : %f",( (s.chem + s.math + s.phy) / 3 ));
getch();
}
```

/* 2. TO SHOW HOW TO ACCESS ELEMENTS OF NESTED STRUCTURES. */

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

struct first
{
int a;
int b;
};
struct second
{
int d;
struct first e;
};

void main()
{
struct second s[3];
int i;
clrscr();
        printf("\n Enter values...\n");
        for(i=0;i<2;i++)
        {
        printf("\n\n Enter any number: ");
        scanf("%d",&s[i].d);
        printf(" Enter any number: ");
        scanf("%d",&s[i].e.a);
        printf(" Enter any number: ");
        scanf("%d",&s[i].e.b);
        }

        s[2] = s[1];
        printf("\n Result is as...\n");
        for(i=0;i<3;i++)
        {
         printf("\n %d\t %d\t %d",s[i].d,s[i].e.a,s[i].e.b);
        }
getch();
}
```

/* 3. TO SHOW THE PASSING OF COMPLETE STRUCTURE BE CALL BY VALUE METHOD. */

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

struct book
{
char title[20];
int pages;
float price;
};

void main()
{
struct book b={"Let Us C",300,225.50};
struct book add(struct book);
clrscr();
        printf("\n Before Call... %s\t %d\t %f",b.title,b.pages,b.price);
        b = add(b);
        printf("\n After Call...  %s\t %d\t %f",b.title,b.pages,b.price);
getch();
}

struct book add(struct book p)
{
        p.pages = p.pages+100;
        p.price = p.price+50.00;
        return(p);
}
```

/* 4. TO PASS THE STRUCTURE BY REFERENCE. */

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

struct record
{
char a;
int c;
float balance;
};

void main()
{
struct record e={'a',12,10.50};
void func1(struct record *p);
clrscr();
        printf("\n Before Call... %c  %d  %f",e.a,e.c,e.balance);
        func1(&e);
        printf("\n After Call... %c  %d  %f",e.a,e.c,e.balance);
getch();
}

void func1(struct record *p)
{
        p -> a = 'b';
        p -> c = 20;
        p -> balance = 200.50;
        printf("\n In Function... %c  %d  %f",p->a,p->c,p->balance);
        return;
}
```

/* 5. TO DEMONSTRATE USE OF ARRAYS OF STRUCTURES. */

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

struct student
{
int rollno;
int cmarks;
int mmarks;
};

void main()
{
struct student std[10];
int n,i,t,j;
clrscr();
        printf("\n How many students : ");
        scanf("%d",&n);
        if(n>10)
        {
         printf("\n You have entered wrong");
         getch();
         exit(1);
        }
        for(i=0;i<n;i++)
        {
         printf("\n Enter Record of Student...\n");
         printf(" Enter the Rollno of Student : ");
         scanf("%d",&std[i].rollno);
         printf(" Enter the Computer marks of Student : ");
         scanf("%d",&std[i].cmarks);
         printf(" Enter the Mathematics marks of Student : ");
         scanf("%d",&std[i].mmarks);
        }

        printf("\n The detail of Student(s) is as...\n");
        printf(" ROLLNO   COMPUTER   MATHEMATICS\n");
        printf("*********************************\n");
        for(i=0;i<n;i++)
        {
         printf("            %d                          %d                          %d
\n",std[i].rollno,std[i].cmarks,std[i].mmarks);
        }
getch();
}
```

/* 6. TO DEMONSTRATE DIFFERENCE BETWEEN STRUCTURE AND UNION. */

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

struct data1
{
char a[100];
int b;
float c;
};

union data2
{
char c[100];
int d;
float x;
char w[123];
};

void main()
{
struct data1 s;
union data2 u;
clrscr();
        printf("\n Size of Structure is %d",sizeof(s));
        printf("\n Size of Union is %d",sizeof(u));
getch();
}
```

FILES

/* 1. PROGRAM TO READ AND WRITE A FILE. */

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

void main()
{
FILE *fp1,*fp2;
char b;
clrscr();
        if((fp1 = fopen("file5.dat","w")) == NULL)
        {
         printf("\n Can't open file1.dat");
         exit(1);
        }

        printf("\n Enter anything and to terminate it press enter key...\n");
        while((b = getchar()) != '\n')
         fputc (b,fp1);

        fclose(fp1);

        printf("\n After reading the contents from file, the Result is as...\n");
        if((fp2 = fopen("file5.dat","r")) == NULL)
        {
         printf("\n Can't open file1.dat");
         exit(1);
        }

        while((b = fgetc(fp2))!= EOF)
         putchar(b);

        fclose(fp2);
getch();
}
```

/* 2. PROGRAM TO COPY ONE FILE TO ANOTHER. */

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

void main()
{
char filename1[9], filename2[9];
FILE *f1,*f2;
char ch;
clrscr();
        printf("\n Enter filename to copy : ");
        gets(filename1);
        printf("\n Enter filename where to copy : ");
        gets(filename2);

        f1 = fopen(filename1,"r");
        f2 = fopen(filename2,"w");

        while((ch = fgetc(f1)) != EOF)
         fputc(ch,f2);

        fclose(f1);
        fclose(f2);

        printf("\n After copying, the contents of second file is as...\n");
        f2 = fopen(filename2,"r");
        while((ch = fgetc(f2)) != EOF)
         putchar(ch);

        fclose(f2);
getch();
}
```

/* 3. PROGRAM TO MERGE TWO FILES IN ANOTHER FILE. */

```
#include<stdio.h>       #include<conio.h>       #include<process.h>
#include<dos.h>
void main()
{
FILE *f1,*f2,*f;
char filename1[25],filename2[25],filename[25],ch;
        printf("\n Enter name of file-1 : ");
        scanf("%s",filename1);
        printf("\n Enter name of file-2 ; ");
        scanf("%s",filename2);
        printf("\n Enter name of file in which you want to merge two files : ");
        scanf("%s",filename);
        if((f1 = fopen(filename1,"r")) == NULL)
        {
         printf("\n Can't open %s file",filename1);
         sleep(3);
         exit(1);
        }

        f = fopen(filename,"w");
        while((ch = fgetc(f1)) != EOF)
         fputc(ch,f);

        fclose(f1);
        fclose(f);

        f = fopen(filename,"a");
        f2 = fopen(filename2,"r");

        while((ch = fgetc(f2)) != EOF)
         fputc(ch,f);
        fclose(f);                      fclose(f2);
        printf("\n       '%s'       and       '%s'       are       both       merged       in
'%s'...",filename1,filename2,filename);

        printf("\n\n Contents of Merged file %s are as...\n");
        if((f = fopen(filename,"r")) == NULL)
        {
         printf("\n Can't open %s file",filename);
         sleep(3);
         exit(1);
        }
        while((ch = fgetc(f)) != EOF)
         putchar(ch);
getch();
}
```

/* 4. TO COUNT NUMBER OF CHARACTERS, VOWELS, TABS AND BLANK SPACES IN A GIVEN FILE. */

```
#include<stdio.h>
#include<conio.h>
#include<process.h>
#include<dos.h>

void main()
{
FILE *f;
int line = 0,blanks = 0,character = 0,tabs = 0;
char filename[30],ch;
clrscr();
        printf("\n Enter filename : ");
        scanf("%s",filename);

        if((f = fopen(filename,"r")) == NULL)
        {
         printf("\n Can't open %s file",filename);
         sleep(3);
         exit(1);
        }

        while((ch = fgetc(f)) != EOF)
        {
         if(ch == ' ')
          blanks++;
           if ( ch == '\n')
            line++;
             if ( ch == '\t')
              tabs++;
         character++;
        }

        printf("\n Total no. of blank spaces in '%s' file are %d",filename,blanks);
        printf("\n Total no. of new lines in '%s' file are %d",filename,line);
        printf("\n Total no. of tabs in '%s' file are %d",filename,tabs);
        printf("\n Total no. of characters in '%s' file are %d",filename,character);

        fclose(f);
getch();
}
```