

1.) Write a program in which you declare variable of all data types supported by C language get input from user and print the value of each variable with alignment left, right and column width 10. for real numbers print their values with two digits right to the decimal.

**CODING:-**

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

void main()
{
    int a;
    unsigned int aa;
    char b;
    unsigned char bb;
    long c;
    unsigned long cc;
    float d;
    double e;
    long double ee;

    clrscr();
    printf("\n enter an integer");
    scanf("%d",&a);
    printf("\ninteger =:%10d",a);
    printf("\ninteger =:%-10d",a);

    printf("\n enter positive no.");
    scanf("%u",&aa);
    printf("\npositive no. =:%10u",aa);
    printf("\npositive no. =:%-10u",aa);

    printf("\n enter a character");
    fflush(stdin);
    scanf("%c",&b);
    printf("\ncharacter =:%10c",b);
    printf("\ncharacter =:%-10c",b);
    printf("\ncharacter equ. to integer=:%10d",b);
    printf("\ncharacter equ. to integer=:%-10d",b);

    printf("\n enter a positive integer in range of 0 to 255:");
    fflush(stdin);
    scanf("%d",&bb);
    printf("\n character =:%10c",bb);
    printf("\n character =:%-10c",bb);
    printf("\n equivalent integer value =:%10d",bb);
    printf("\n equivalent integer value =:%-10d",bb);

    printf("\n enter a long integer");
    scanf("%ld",&c);
    printf("\nlong integer=:%10ld",c);
    printf("\nlong integer=:%-10ld",c);

    printf("\n enter an unsigned integer");
    scanf("%ud",&cc);
```

```

printf("%10ud",cc);
printf("%-10ud",cc);
/* for input in unsigned char %c is format specifier */

printf("\n enter a float value");
scanf("%f",&d);
printf("%10.2f",d);
printf("%-10.2f",d);

printf("\n enter a double value");
scanf("%lf",&e);
printf("%10.2lf",e);
printf("%-10.2lf",e);

printf("\n enter a long double value");
scanf("%lf",&ee);
printf("%10.2lf",ee);
printf("%-10.2lf",ee);

getch();
}

```

---

2.) Write a program to print all combination of 123 ?

**CODING:-**

```

#include<stdio.h>
#include<conio.h>
Void main()
{
int i,j,k;
clrscr();
for(i=1;i<=3;i++)
for(j=1;j<=3;j++)
for(k=1;k<=3;k++)
if(i!=j&&j!=k&&i!=k)
printf("\n %d%d%d",i,j,k);
getch();
}

```

---

3.) Write program to generate following pattern

a)	A B C D E F G	b) 1	c) *
	A B C E F G	1 2	* *
	A B F G	1 2 3	* * *
	A G		

a) **CODING:-**

```

#include<stdio.h>

```

```
#include<conio.h>
void main()
{
    int i,j,k;
    clrscr();
    for(i=1;i<=4;i++)
    {
        for(j=1;j<=5-i;j++)
        printf("%c", (char) (64+j));
        for(k=1;k<=2*i-1;k++)
        prin-tf(" ");
        printf("\b\b");
        for(j=j-2;j>=0;j--)

        printf("%c", (char) (65+j));
        printf("\n");
    }
    getch();
}
```

**b.) CODING:-**

```
#include<stdio.h>
#include<conio.h>
void main()
{
    int i,j;
    clrscr();
    for(i=1;i<=3;i++)
    {
        for(j=1;j<=i;j++)
        printf("%d",j);
        printf("\n");
    }
    getch();
}
```

**c.) CODING:-**

```
#include<stdio.h>
#include<conio.h>
void main()
{
    int i,j,k;
    clrscr();
    for(i=1;i<=3;i++)
    {
        for(j=3;j>=i;j--)
        printf(" ",j);
        {
            for(k=1;k<=i;k++)
            printf(" *");
            printf("\n");
        }
    }
    getch();
}
```

4.) Write a program to display number 1 to 10 in octal, decimal and hexadecimal system.

**CODING:-**

```
#include<stdio.h>
#include<conio.h>
void main()
{
    int i;
    for(i=1;i<=10;i++)
    {
        printf("\ndec=%5d, hex=%5x , oct=%5o",i,i,i);
        printf("\n");
    }
    getch();
}
```

-----

5.) Write a program to perform following tasks using switch..case, loop, and conditional operator.

- a) Find factorial of a number.
- b) Print Fibonacci series up to n terms and its sum.
- c) Print prime number up n terms.
- d) Print whether a given year is leap or not.

**CODING:-**

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

void main()
{
    int n,p,f,i;
    int num,f1=0,f2=1;
    clrscr();
    do
    {
        printf("\n 1. find factorial");
        printf("\n 2. fibonacci series and sum");
        printf("\n 3. print prime number n terms ");
        printf("\n 4. check leap year");

        printf("\n 5. exit");
        printf("\n enter choice");
        scanf("%d",&n);
        switch(n)
        {
            case 1:
                printf("\n enter a value to know factorial");
                scanf("%d",&n);
                f=1;
                for(i=2;i<=n;i++)
                    f=f*i;
        }
    }
}
```

```
printf("\n factorial=%d",f);

break;
case 2:
printf("\n how many terms to generate:");
scanf("%d",&num);
p=0;
for(i=1;i<=num;i++)
{
printf("\t %d",f1);
p=p+f1;

f=f1+f2;
f1=f2;
f2=f;
}
printf("\n sum=%d",p);
break;

case 3:
printf("\n enter no. to check primality:");
scanf("%d",&num);

for(i=2;i<num;i++)
{
if(num%i==0)
break;
}
if(i>=num)
printf("\n prime");
else
printf("\n not prime");
break;
case 4:
printf("\n enter year to check leap:");
scanf("%d",&num);

(num%100==0)
?
(num%400==0)?printf("\n leap"):printf("not leap")
:
(num%4==0)?printf("\n leap"):printf("not leap");

break;
}
}while(n!=5);
getch();
}
```

---

**6.) Create a single program to perform following tasks using switch, if else, loop and**

- a. To reverse the string.**
- b. To count the number of characters in string.**
- c. To copy the one string to other string.**

- d. To find whether a given string is palindrome or not.
- e. To count no of vowels, consonants in each word of a sentence.
- f. To arrange the alphabets of a string in ascending order.

**CODING:-**

```
#include <stdio.h>
#include <conio.h>
#include <string.h>
void main()
{
    char a[80],b[80],s;
    int n;
    char temp;
    char p[30][50];
    int i,j=0,k=0;
    int v=0,c=0;

    do
    {
        printf("\n1. to reverse string");
        printf("\n2. count no. of characters");
        printf("\n3. copy one string to other");
        printf("\n4. check palindrome");
        printf("\n5. count vowels,consonant in each word");
        printf("\n6. arrange the alphabets in ascending order");
        printf("\n7. exit");
        printf("\n enter your choice");
        scanf("%d",&n);
        switch(n)
        {
            case 1:
                printf("\n enter string\n");
                scanf("%s",a);
                for(i=0;a[i]!='\0';i++);

                i=i-1;
                n=i;
                i=0;
                for(;n>=i;i++,n--)
                {
                    temp=a[i];
                    a[i]=a[n];
                    a[n]=temp;
                }
                printf("\n string is %s",a);
                break;
            case 2:
                printf("\n enter string\n");
                scanf("%s",a);
                printf("\n string is %s",a);
                for(i=0;a[i]!='\0';i++);

                printf("\n no. of characters=%d",i);
                break;
            case 3:
```

```

printf("\n enter string\n");
scanf("%s",a);
for(i=0;a[i]!='\0';i++)
{
    b[i]=a[i];
}
b[i]='\0';

printf("\n string is %s",b);
break;
case 4:
printf("\n enter string\n");
scanf("%s",a);
for(i=0;a[i]!='\0';i++);
n=i;
n=n-1;
i=0;

for(;a[n]==a[i] && n>=i;i++,n--);

printf("\n string is %s",a);
if(!(n>=i))
    printf("\n palindrome");
else
    printf("\n not palindrome");
break;

case 5:
fflush(stdin);
printf("\n enter a sentence below\n");
gets(a);
printf("\n string is %s",b);
for (i=0;a[i]!='\0';i++)
{
    if(a[i]!=' ')
        p[j][k++]=a[i];
    else
    {
        p[j][k]='\0';
        k=0;
        j++;
    }
}
p[j][k]='\0'; //each word now lies in separate array single
dimension
// array, j contains no. of words so for, a single space
// uses one dimensional array

v=0;
c=0;
for(i=0;i<=j;i++)
{
    for(k=0;p[i][k]!='\0';k++)
    {
        switch(p[i][k])
        {
            case 'a':

```

```
        case 'A':
        case 'e':
        case 'E':
        case 'i':
        case 'I':
        case 'o':
        case 'O':
        case 'u':
        case 'U':
            v++;
            break;
        case ' ':
            break;
        default:
            if(isalpha(p[i][k]))
                c++;
    }

    }
    if(v>0||c>0)
    {
        printf("\n word=%s",p[i]);
        printf("\n vowels=%d,consonant=%d",v,c);
    }
    v=0;
    c=0;
}

        break;
case 6:
    printf("\n enter string:");
    scanf("%s",a);
    for(n=0;a[n]!='\0';n++);
    n=n-1;

    for(i=0;i<n-1;i++)
        for(j=0;j<n-i;j++)
        {
            if(a[j]>a[j+1])
            {
                temp=a[j];
                a[j]=a[j+1];
                a[j+1]=temp;
            }
        }
    printf("\n string is %s",a);

    break;

}

}while (n!=7);
getch();
}
```



7.) Create a single program to perform following tasks using single dimension integer array:

a. Sort the elements.

b. Search for presence of particular value in array element using linear search.

c. Search for presence of particular value in array element using binary search.

**CODING:-**

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

void main()
{
    int a[5],v,low,mid,high;
    int i,j,n,temp;

    do
    {
        printf("\n1. to sort");
        printf("\n2. to linear search");
        printf("\n3. to binary search");
        printf("\n4. exit");
        printf("\n  enter your choice");
        scanf("%d",&n);
        switch(n)
        {
            case 1:
                printf("\n enter 5 values\n");
                for(i=0;i<5;i++)
                    scanf("%d",&a[i]);
                for(i=0;i<5-1;i++)
                    for(j=0;j<5-i-1;j++)
                    {
                        if(a[j]>a[j+1])
                        {
                            temp=a[j];
                            a[j]=a[j+1];
                            a[j+1]=temp;
                        }
                    }
                printf("\n sorted array is\n");
                for(i=0;i<5;i++)
                    printf("\t%d",a[i]);

                break;
            case 2:
                printf("\n enter 5 values\n");
                for(i=0;i<5;i++)
                    scanf("%d",&a[i]);

                printf("\n enter value to search\n");
                scanf("%d",&v);
                for(i=0;i<5;i++)
                {
                    if(v==a[i])
```

```

        break;
    }
    if(i==5)
        printf("\n value not found");
    else
        printf("\n value found at index %d",i);
    break;
case 3:
    printf("\n enter 5 values in ascending order\n");
    for(i=0;i<5;i++)
        scanf("%d",&a[i]);

    printf("\n enter value to search\n");
    scanf("%d",&v);

    for(low=0,high=5,mid=(low+high)/2;low<=high;mid=(low+high)/2)
    {
        if(v>a[mid])
            low=mid+1;
        else if(v<a[mid])
            high=mid-1;
        else
            break;
    }
    if(low<=high)
        printf("\n value found at %d",mid);
    else
        printf("\n value not found");

    break;

}

}while (n!=4);
getch();
}

```

-----

**8.) Write a program that read the afternoon day temperature for each day of the month and then report the month average temperature as well as the days on the days on which hottest and coolest days occurred.**

**CODING:-**

```

#include<stdio.h>
#include<conio.h>
void main()
{
    float  a [31];
    float sum=0,avg,hot,cool;
    int  n,i,hotday,coolday;
    clrscr();
    printf("\n enter no. of  days in current month ");
    scanf("%d",&n);
    printf("\n Enter each day temperature ");

```

```
for(i=0;i<=n;i++)
scanf("%f",&a[i]);
for(i=0;i<n;i++)
sum=sum+a[i];
avg=sum/n;
hot=a[0];
cool=a[0];
hotday=1;
coolday=1;
for(i=1;i<n;i++)
{
    if(hot<a[i])
    {
        hot=a[i];
        hotday=i;
    }
    if(cool>a[i]);
    {
        cool=a[i];
        coolday=I;
    }
}
Printf("\n average temperature=%f",avg);
printf("\n hottest temperature=%f on day %d",hot,hotday);
printf("\n coolest temperature=%f on day %d",cool,coolday);
getch();
}
```

-----

**9.) Create a single program to perform following tasks using switch, if else, loop and double dimension integer array of size 3\*3:**

- a) Addition of two matrix.
- b) Subtraction of two matrix.
- c) Multiplication of two matrix.
- d) Sum of diagonal elements.

**CODING:-**

```
#include <stdio.h>
#include <conio.h>
#include <string.h>
#define row 3
#define col 3

void main()
{
    float a[row][col],b[row][col],c[row][col];
    int n;
    int i,j,k;
    float fd,bd;
    clrscr();
    do
    {
```

```
printf("\n1. addition of matix");
printf("\n2. subtraction of matrix");
printf("\n3. multiplication of matrix");
printf("\n4. sum of diagonal element of matrix");
printf("\n5. exit");
printf("\n  enter your choice");
scanf("%d",&n);
switch(n)
{
  case 1:
    printf("\n enter %d values below\n",row*col);
    for(i=0;i<row;i++)
      for(j=0;j<col;j++)
        scanf("%f",&a[i][j]);

    printf("\n enter %d values below\n",row*col);
    for(i=0;i<row;i++)
      for(j=0;j<col;j++)
        scanf("%f",&b[i][j]);

    for(i=0;i<row;i++)
    {
      for(j=0;j<col;j++)
        c[i][j]=a[i][j]+b[i][j];
    }

    printf("\n matrix is \n");
    for(i=0;i<row;i++)
    {
      for(j=0;j<col;j++)
        printf("\t%.2f",c[i][j]);
      printf("\n");
    }
    break;
  case 2:
    printf("\n enter %d values below\n",row*col);
    for(i=0;i<row;i++)
      for(j=0;j<col;j++)
        scanf("%f",&a[i][j]);

    printf("\n enter %d values below\n",row*col);
    for(i=0;i<row;i++)
      for(j=0;j<col;j++)
        scanf("%f",&b[i][j]);

    for(i=0;i<row;i++)
    {
      for(j=0;j<col;j++)
        c[i][j]=a[i][j]-b[i][j];
    }

    printf("\n matrix is \n");
    for(i=0;i<row;i++)
    {
      for(j=0;j<col;j++)
        printf("\t%.2f",c[i][j]);
      printf("\n");
    }
}
```

```
    }

    break;
case 3:
printf("\n enter %d values below\n",row*col);
for(i=0;i<row;i++)
    for(j=0;j<col;j++)
        scanf("%f",&a[i][j]);

printf("\n enter %d values below\n",row*col);
for(i=0;i<row;i++)
    for(j=0;j<col;j++)
        scanf("%f",&b[i][j]);

for(i=0;i<row;i++)
{
for(k=0;k<col;k++)
{
c[i][k]=0;
for(j=0;j<col;j++)
c[i][k]=c[i][k]+a[i][j]*b[j][k];
}
}

printf("\n matrix is \n");
for(i=0;i<row;i++)
{
for(j=0;j<col;j++)
printf("\t%.2f",c[i][j]);
printf("\n");
}

break;
case 4:
printf("\n enter %d values below\n",row*col);
fd=0;
bd=0;
for(i=0;i<row;i++)
    for(j=0;j<col;j++)
        scanf("%f",&a[i][j]);
fd=0;
bd=0;
for(i=0;i<row;i++)
{
fd=fd+a[i][i];
bd=bd+a[i][2-i];
}
printf("\n forward diagonal=%f",fd);
printf("\n backward diagonal=%f",bd);
break;

}

}while (n!=5);
}
```

10.) Create a single program to perform following tasks using double dimension character array of size 5\*40:

- a) Sorting of string.
- b) Finding the largest string.
- c) Finding the smallest string.
- d) Searching for presence of a string in array.

**CODING:-**

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

void main()
{
    char a[5][40],s[40];
    char temp[40];
    int n,i,j;
    clrscr();
    printf("\n enter five strings below\n");
    for(i=0;i<5;i++)
        scanf("%s",a[i]);

    printf("\n five strings:");
    for(i=0;i<5;i++)
        printf("\n%s",a[i]);

    printf("\n enter string to search:");
    scanf("%s",s);
    for(i=0;i<5;i++)
    {
        if(strcmpi(a[i],s)==0)
        {
            break;
        }
    }
    if(i==5)
        printf("\n string no found");
    else
        printf("\n string found at index %d",i);

    strcpy(temp,a[0]);
    for(i=1;i<5;i++)
    {
        if(strcmpi(a[i],temp)>0)
        {
            strcpy(temp,a[i]);
        }
    }
    printf("\n smallest string= %s",temp);

    strcpy(temp,a[0]);
    for(i=1;i<5;i++)
    {
        if(strcmpi(a[i],temp)<0)
        {
            strcpy(temp,a[i]);
        }
    }
}
```

```
    }
}
printf("\n largest string= %s",temp);
for(i=0;i<4;i++)
{
    for(j=0;j<4-i;j++)
    {
        if(strcmpi(a[j],a[j+1])>0)
        {
            strcpy(temp,a[j]);
            strcpy(a[j],a[j+1]);
            strcpy(a[j+1],temp);
        }
    }
}
printf("\n after sorting");

printf("\n five strings:");
for(i=0;i<5;i++)
    printf("\n%s",a[i]);
getch();
}
```

-----

**11.) Write program using the function power (a, b) to calculate the value of a raised to b.**

**CODING:-**

```
#include<stdio.h>
#include<conio.h>
void power(int,int);
void main()
{
    int a,b;
    clrscr();
    printf("Enter any number of a & power b:");
    scanf("%d%d",&a,&b);
    power(a,b);
    getch();
}
void power(int a,int b)
{
    int i,z;
    z=a;
    for(i=2;i<=b;i++)
        a=a*z;
    printf("\nvalue of a raised to b=%d",a);
}
```

-----

**12.) Write program to demonstrate difference between static and auto variable.**

**CODING:-**

```
#include<stdio.h>
#include<conio.h>
void main()
{
    void staticdisplay();
    void autodisplay();

    staticdisplay();
    staticdisplay();
    staticdisplay();

    autodisplay();
    autodisplay();
    autodisplay();

    getch();
}
void staticdisplay()
{
    static int a=0;
    printf("\n static count =%d",a);
    a++;
}
void autodisplay()
{
    int a=0;
    printf("\n auto count =%d",a);
    a++;
}
```

-----  
**13.) Write program to demonstrate difference between local and global variable.**

**CODING:-**

```
#include<conio.h>
#include<stdio.h>
int gb=10;
void main()
{
    int gb=30;
    void display();
    printf("\n value of local gb in main=%d",gb);
    printf("\n value of global gb in main=%d",::gb);
    ::gb=20;
    display();
    printf("\n value of global gb in main after function
           display=%d",::gb);

    getch();
}
```



```
}
void display()
{
    int p=20;
    printf("\n value of  global variable before alteration made by
        display= %d",gb);
    printf("\n value of local variable=%d",p);
    gb=40;
}
```

-----

**14.) Write a program to perform following tasks using switch...case, loop, and conditional operator.**

**a) Find factorial of a number.**

**b) Print Fibonacci series up to n terms and its sum.**

**CODING:-**

```
#include<stdio.h>
#include<conio.h>
void main()
{
    int n,p,f,i;
    int num,f1=0,f2=1;
    clrscr();
    do
    {
        printf("\n 1. find factorial");
        printf("\n 2. fibonacci series and sum");
        printf("\n enter choice");
        scanf("%d",&n);
        switch(n)
        {
            case 1:
                printf("\n enter a value to know factorial");
                scanf("%d",&n);
                f=1;
                for(i=2;i<=n;i++)
                    f=f*i;

                printf("\n factorial=%d",f);

                break;
            case 2:
                printf("\n how many terms to generate:");
                scanf("%d",&num);
                p=0;
                for(i=1;i<=num;i++)
                {
                    printf("\t %d",f1);
                    p=p+f1;

                    f=f1+f2;
                    f1=f2;
                    f2=f;
                }
            }
    }
}
```

```
    }
    printf("\n sum=%d",p);
    break;

}
}while(n!=3);
getch();
}
```

-----

15.) Write a program to perform following tasks using switch.....  
case, loop and function .

- a) find factorial of a number
- b) print Fibonacci series upto ten terms and its sum
- c) Print natural series upto n terms and its sum

**CODING:-**

```
#include<stdio.h>
#include<conio.h>
long fact(int n)
{
    long f=1;
    int i;
    for(i=2;i<=n;i++)
        f=f*i;
    return f;
}

long fib(int n)
{
    long p=0, f1=0, f2=1, f;
    int i;
    for(i=1;i<=n;i++)
    {
        printf("\t %d", f1);
        p=p+f1;
        f=f1+f2;
        f1=f2;
        f2=f;
    }
    return p;
}

long natu(int n)
{
    float f=0;
    int i;
    for ( i=1;i<=n;i++)
    {
        printf("\t %d",i);
        f=f+i;
    }
}
```

```

    }
    return f;
}

void main()
{
    int n,m,I;
    float x,s,mf,term,q;
    long f,p;
    do
    {
        printf("\n 1. find factorial ");
        printf("\n 2. Fibonacci series and sum ");
        printf("\n 3. natural series and sum ");
        printf("\n 4. Exit ");
        printf("\n enter the choice");
        scanf("%d",&n);
        switch(n)
        {
            case 1:
                printf("\n Enter a value to know factorial ");
                f=fact(n);
                printf("\n factorial =%ld",f);
                break;
            case 2:
                printf("\n How many terms to generate :");
                scanf("%d ",&num );
                p=fib(num);
                printf("\n sum =%ld",p);
                break;
            case 3:
                printf("\n how many terms of natural series to generate :");
                scanf("%d",&num);
                f=0;
                f=natu(num);
                printf("\n sum=%ld",f);
                break;
        }
    }while(n!=4);
    getch();
}

```

-----

**16.) Write a function to accept 10 characters and display whether each input character is digit uppercase letter or lower case letter.**

**CODING:-**

```

#include<stdio.h>
#include<conio.h>
void main()
{
    void disp();
    disp();
    getch();
}

```

```
}

void disp()
{
    int m;
    char c;
    clrscr();
    for (m=1;m<=10;m++)
    {
        printf("\nenter character %d : ",m);
        fflush(stdin);
        scanf("%c",&c);
        if (c>=65 && c<=90)
            printf("\n uppercase letter");
        else if (c>=97 && c<=122)
            printf("\n lower case letter");
        else if (c>=48 && c<=57)
            printf("\n digit");
        else
            printf("\n it is neither an alphabet nor digit");
    }
}
```

-----

**17.) Create a single program to perform the following tasks using switch, if..else, loop, function and double dimension integer array of size 3\*3**

- a) Addition of two matrix.
- b) Substraction of two matrix.
- c) Multiplication of two matrix.
- d) Inverse of matrix.
- e) transpose of matrix.

Coding:-

```
#include<stdio.h>
#include<conio.h>
#include<string.h>
#define row 3
#define col 3

void input(float a[] [col])
{
    int i,j;
    printf("\n matrix is \n");
    for(i=0;i<=row;i++)
        for(j=0;j<col;j++)
            scanf("%f",a[i] [j]);
}

void output(float a[] [col])
{
    int i,j;
    printf("\n matrix is \n");
    for(i=0;i<row;i++)
```

```
    {
        for(j=0;j<col;j++)
            printf("\t %.2f ",a[i] [j]);
        printf("\n");
    }
}

void add(float a[] [col], float b[] [col], float c[] [col])
{
    int i,j;
    for(i=0;i<row;i++)
    {
        for(j=0,j<col;j++)
            c[i][j]=a[i][j]-b[i][j];
    }
}

void mul(float a[][col],float b[][col],float c[][col])
{
    int i,j,k;
    for(i=0;i<row;i++)
    {
        for(k=0;k<col;k++)
        {
            c[i][k]=0;
            for(j=0;j<col;float;j++)
                c[i][k]=c[i][k]+a[i][j]*b[j][k];
        }
    }
}

void tran(float a[][col],float b[][col])
{
    int i,j,kk
    for(i=0;i<row;i++)
    {
        b[i][j]=a[j][i];
    }
}

void inverse(float a[][col],float b[][col])
{
    float x[row][col],float,y[row][col],m;
    int i,j,k;
    for(i=0;i<row;i++)
    for(j=0;j<col;j++)
    {
        if(i==j)
            y[i][j]=1;
        else
            y[i] [j]=0;
        x[i] [j]=a[i] [j];
    }
}

for(i=0;i<row;i++)
{
    m=x[i] [i];
```

```
    for(j=0;j<col;j++)
    {
        x[i][j]=x[i][j]/m;
        y[j][i]=y[j][i]/m;
    }
for(k=0;k<row;k++0)
{
    if (i!=k)
    {
        m=x[k][i];
        for(j=0;j<col;j++)
        {
            x[k][j]=x[k][j]-m*x[i][j];
            y[k][j]=y[k][j]-m*y[i][j];
        }
    }
}
for(i=0;i<row;i++)
{
    for(j=0;j<col;j++)
    {
        b[i][j]=y[i][j];
    }
}
}

void main ()
{
    float a[row][col],b[row][col],c[row][col],d[row][col];
    int n;

    do
    {
        printf("\n1. addition of matrix");
        printf("\n2. subtraction of matrix");
        printf("\n3. multiplication of matrix");
        printf("\n4. inverse of matrix");
        printf("\n5.transpose of matrix");
        printf("\n6. exit");
        printf("\n    Enter your choice ");
        scanf("%d", &n);
        switch(n)
        {
            case 1:
                input (a);
                input (b);
                add (a,b,c);

                output (c);
                break;
            case 2:
                input (a);
                input (b);
                sub (a,b,c);

                output (c);
```

```

        break;
    case 3:
        input (a);
        input (b);
        mul (a,b,c);

        output (c);
        break;
    case 4:
        input (a);
        inverse (a,b);

        output (b);
        break;
    case 5:
        input (a);
        tran (a,b);
        output (b);
        break;
    }
}while (n!=6);
}

```

-----

**18.) Create a single program to perform following task using switch, if-else, loop. user defined function and single dimension character array:**

- a) To reverse the string.
- b) To count the number of characterstic string.
- c) To copy the one string to other string.
- d) To find wether a given string is palindrome or not.
- e) To count no. of vowels ,consonant in each word of a sentence and no of punctuations in sentence.

**CODING:-**

```

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

void input( char a[])
{
    int i;
    printf("\n Enter string \n");
    scanf("%s",a);
}

void output(char a[])
{
    printf("\n String is %s",a);
}

void reverse(char a[])
{
    int n,i;

```

```
char temp;
n=count(a);
n=n-1;
for (i=0;i<=n;i++;n--)
{
    temp=a[i];
    a[i]=a[n];
    a[n]=temp;
}

int count(char a[])
{
    int i;
    for(i=0;a[i]!='\0';i++)
    return i;
}

void copy(char t[], char s[])
{
    int I;
    for(i=0;s[i]!='\0';i++)
    {
        t[i]=s[i];
    }
    t[i]='\0';
}

int palindrome(char a[])
{
    int n,i;
    n=count(a);
    n=n-1;
    for(i=0;a[n]==a[i] && n>=i; i++;n--)
    if(n>=i)
        return 0;
    else
        return 1;
}

void wordprocess(char s[])
{
    char p[30] [50];
    int i,j=0,k=0;
    int v=0;c=0;
    for(i=0;s[i]!='\0';i++)
    {
        if(s[i]!=' ')
            p[j] [k++]=s[i];
        else
        {
            p[j] [k]='\0';
            k=0;
            j++;
        }
    }
    p[j] [k]='\0';
}
```



```
v=0;
c=0;
for(i=0;i<=j;i++)
{
    for(k=0;p[i] [k]!='\0';k++)
    {
        switch(p[i] [k])
        {
            case 'a':
            case 'A':
            case 'e':
            case 'E':
            case 'i':
            case 'I':
            case 'o':
            case 'O':
            case 'u':
            case 'U':
                v++;
                break;
            case ' ':
                break;
            default:
                if(isalpha (p[i] [j]))
                    c++;
        }
    }
}
if (v>0||c>0)
{
    printf("\n word=%s",p[i]);
    printf("\n vowels=%d,consonant=%d",v,c);
}
v=0;
c=0;
}
}

void main ()
{
    char a[80],b[80],s;
    int n;

    do
    {
        printf("\n1. to reverse string")
        printf("\n 2. count no. of characters ");
        printf("\n 3. copy one string to other ");
        printf("\n 4. check palindrome");
        printf("\n 5. check vowels, consonant in each word");
        printf("\n enter your choice ");
        scanf("%d",&n);
        switch(n)
        {
            case 1:
                input(a);
                reverse(a);
                output(a);
```

```

        break;
    case 2:
        input(a);
        output(a);
        printf("\n no. of characters =%d",count(a));
        break;
    case 3:
        input(a);
        copy(b,a);
        output(b);
        break;
    case 4:
        input(a);
        n=palindrome(a);
        output(a);
        if(n==1)
            printf("\n palindrome ");
        else
            printf("\n not palindrome ");
        break;
    case 5:
        fflush(stdin);
        printf("\n Enter a sentence below \n ");
        gets(a);
        output(a);
        wordprocessor(a);
        break;
    }
}while(n!=6);
getch();
}

```

-----

**19.) Create a single program to perform following tasks using switch,if....else,loop,user defined function and single dimension integer array**

- a). Sort the element
- b). Find larger element
- c). Search for presence of particular value in array element using linear search.
- d). Search for presence of particular value in array element using binary search.

**CODING:-**

```

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

void input (char a[] [40])
{
    int i;
    clrscr();
    printf("\n Enter five strings below\n:");

```

```
    for(i=0;i<5;i++)
        scanf("%s",a[i]);
}

void output(char a[] [40])
{
    int i;
    printf("\n five strings: ");
    for(i=0;i<=5;i++)
        printf("\n%s",a[i]);
}

void sort(char a[][40])
{
    char temp;
    int i,j;
    for(i=0;i<=4;i++)
        for(j=0;j<=4-i;j++)
            {
                if(strcmpi(a[j],a[j+1])>0)
                    {
                        strcpy(temp,a[j]);
                        strcpy(a[j],a[j+1]);
                        strcpy(a[j+1], temp);
                    }
            }
}

void largest(char a[][40])
{
    char temp[40];
    int i;
    strcpy(temp,a[i]);
    for(i=1;i<5;i++)
        {
            if(strcmpi(a[i],temp)>0)
                {
                    strcpy(temp,a[i]);
                }
        }
    printf("\n largest string= %s",temp);
}

void smallest(char a[][40])
{
    char temp[40];
    int i;
    strcpy(temp,a[i]);
    for(i=1;i<5;i++)
        {
            if(strcmpi(a[i],temp)<0)
                {
                    strcpy(temp,a[i]);
                }
        }
    printf("\n smallest string= %s",temp);
}
```

```
int search(char a[][40],char s[40])
{
    int i;
    for(i=0;i<5;i++)
    {
        if(strcmpi(a[i],s)==0)
        {
            break;
        }
    }
    return i;
}

void main()
{
    char a[5][40],s[40];
    int n;
    input(a);
    output(a);
    printf("\n Enter string to search: ");
    scanf("%s",s);
    n=search(a,s);
    if(n==5)
        printf("\n String not found");
    else
        printf("\n string found at index %d",n)

    largest(a);
    smallest(a);

    sort(a);
    printf("\n After sorting");
    output(a);
    getch();
}
```

-----

**20.) Create a single program to perform following tasks using switch,if...else,loop,user defined function and double dimension character array of size 5\*40:**

- a) Sorting of string.
- b) Searching for presence of string in array.

**CODING:-**

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

void input (char a[] [40])
{
    int i;
    clrscr();
    printf("\n Enter five strings below\n:");
```

```
    for(i=0;i<5;i++)
        scanf("%s",a[i]);
}

void output(char a[] [40])
{
    int i;
    printf("\n five strings: ");
    for(i=0;i<=5;i++)
        printf("\n%s",a[i]);
}

void sort(char a[][40])
{
    char temp;
    int i,j;
    for(i=0;i<=4;i++)
        for(j=0;j<=4-i;j++)
            {
                if(strcmpi(a[j],a[j+1])>0)
                    {
                        strcpy(temp,a[j]);
                        strcpy(a[j],a[j+1]);
                        strcpy(a[j+1], temp);
                    }
            }
}

int search(char a[][40],char s[40])
{
    int i;
    for(i=0;i<5;i++)
        {
            if(strcmpi(a[i],s)==0)
                {
                    break;
                }
        }
    return i;
}

void main()
{
    char a[5][40],s[40];
    int n;
    input(a);
    output(a);
    printf("\n Enter string to search: ");
    scanf("%s",s);
    n=search(a,s);
    if(n==5)
        printf("\n String not found");
    else
        printf("\n string found at index %d",n)

    sort(a);
```

```
printf("\n After sorting");
output(a);
getch();
}
```

-----

**21.) Create a structure student having data members to store roll number, name of student, name of three subjects, max marks, min marks obtained marks. Declare a structure variable of student provide facilities to input data in data members and display result of student.**

**CODING:-**

```
#include <stdio.h>
#include <conio.h>
struct student
{
    char rollno[10];
    char name[30];
    char sname[3][20];
    int max[3];
    int min[3];
    int obtained[3];
};
void main()
{
    int i,maxtotal=0,total=0;
    struct student s;
    printf("\n enter rollno of student");
    scanf("%s",s.rollno);
    printf("\n enter name of student");
    scanf("%s",s.name);

    printf("\n enter name of subject,max. mark,min. marks,obtained
\nmarks for three subjects\n");
    for(i=0;i<3;i++)
    {
        printf("\n enter name of subject");
        scanf("%s",s.name[i]);
        printf("\n enter max. mark of subject");
        scanf("%d",&s.max[i]);
        printf("\n enter min. mark of subject");
        scanf("%d",&s.min[i]);
        printf("\n enter obtained mark of subject");
        scanf("%d",&s.obtained[i]);
    }
    printf("\nrollno=%s",s.rollno);
    printf("\nname of student=%s",s.name);
    printf("\nsubject\tmax. mark\tmin mark\tobtained");
    for(i=0;i<3;i++)
    {
        printf("\n%s\t\t%d\t\t%d\t\t%d",s.name[i],s.max[i],s.min[i],s.obtained
[i]);
        total=total+s.obtained[i];
    }
}
```

```
    maxtotal=maxtotal+s.max[i];
}
printf("\nscored %d out of %d",total,maxtotal);
printf("\n%% scored is %.2f", (float)total/maxtotal*100);
getch();
}
```

-----

22.) Create structure Date with data member's dd,mm,yy(to store date). Create another structure employee with data members to hold name of employee,employee id and date of joining(date of joining will be hold by variable of structure Date which appears as data member inn Employee structure).store data of an employee and print the same.

**CODING:-**

```
#include<stdio.h>
#include<conio.h>
#include<string.h>
struct date
{
    int mm,dd,yy;
};
struct employee
{
    char empid[10];
    char name[30];
    float salary;
    struct date doj;
};
void main()
{
    struct employee e;

    printf("\n Enter empid of employee: ");
    scanf("%s",e.empid);
    printf("\n Enter name of employee: ");
    scanf("%s",e.name);

    printf("\n Enter salary: ");
    scanf("%s",e.salary);

    printf("\n Enter date of joining as mm dd yy: ");
    scanf("%s",e.doj.mm, e.doj.dd, e.doj.yy);

    printf("\n Details of employee is as follows\n");
    printf("\n e.empid= %s", e.empid);
    printf("\n Name of employee= %s",e.name);
    printf("\n Salary of employee= %f",e.salary);
    printf("\n Date of joining (mm/dd/yy) %d/%d/%d",e.doj.mm,
        e.doj.dd, e.doj.yy);

    getch();
}
```

23.) Create structure student having data members to store roll number, name of student, name of three subjects, max, min marks, obtained marks. Declare array of structure to hold data of 3 students. provide facilities to display result of all students. provide facility to display result of specific student whose roll number is given.

**CODING:-**

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

struct student
{
    char rollno[10];
    char name[30];
    char sname[3][20];
    int max[3];
    int min[3];
    int obtained[3];
};

void main()
{
    int i, maxtotal=0, total=0;
    struct student s;
    printf("\n enter rollno of student");
    scanf("%s", s.rollno);
    printf("\n enter name of student");
    scanf("%s", s.name);

    printf("\n enter name of subject, max. mark, min. marks, obtained
\nmarks for three subjects\n");

    for(i=0; i<3; i++)
    {
        printf("\n enter name of subject");
        scanf("%s", s.name[i]);
        printf("\n enter max. mark of subject");
        scanf("%d", &s.max[i]);
        printf("\n enter min. mark of subject");
        scanf("%d", &s.min[i]);
        printf("\n enter obtained mark of subject");
        scanf("%d", &s.obtained[i]);
    }

    printf("\nrollno=%s", s.rollno);
    printf("\nname of student=%s", s.name);
    printf("\nsubject\tmax. mark\tmin mark\tobtained");
    for(i=0; i<3; i++)
    {
        printf("\n%s\t\t%d\t\t%d\t\t%d", s.name[i], s.max[i], s.min[i], s.obtained
[i]);
        total=total+s.obtained[i];
        maxtotal=maxtotal+s.max[i];
    }
}
```



```
printf("\nscored %d out of %d",total,maxtotal);
printf("\n% scored is %.2f", (float)total/maxtotal*100);
getch();
}
```

-----

**24.) Define union Emp having data members:-one integer, one float and one single dimension character array. Declare a union variable in main and test the union variable.**

**CODING:-**

```
#include<stdio.h>
#include<conio.h>
void main()
{
    union emp
    {
        char name[20];
        int age;
        float salary;
    } e;
    clrscr();
    strcpy(e.name, "ram");
    printf("\nname= %s", e.name);
    e.age=44;
    printf("\nage= %d", e.age);
    e.salary=4353;
    printf("\nsalary= %f", e.salary);
    getch();
}
```

-----

**25.) Define an enum Days\_of\_week members of which will be days of week. Declare an enum variable in main and test it.**

**CODING:-**

```
#include<stdio.h>
#include<conio.h>
enum days_of_week {sun=1,mon=2,tue,wed,thu,fri,sat};
void main()
{
    enum days_of_week e; /* declaration of enum variable which can take
value either false or true */
    e=sun;
    printf("\n value of sun=%d",e);
    e=mon;
    printf("\n value of mon=%d",e);
    getch();
}
```

26.) Write a program of swapping two numbers and demonstrates call by value and call by reference.

**CODING:-**

```
#include<stdio.h>
#include<conio.h>
void main()
{
    int a=3,b=4;
    void byvalswap(int ,int );
    void byrefswap(int *,int *);

    printf("\n before call of byvalswap value of a=%d,b=%d",a,b);
    byvalswap(a,b);
    printf("\n after call of byvalswap value of a=%d,b=%d",a,b);

    printf("\n before call of byrefswap value of a=%d,b=%d",a,b);
    byrefswap(&a, &b);
    printf("\n after call of byrefswap value of a=%d,b=%d",a,b);
    getch();
}
void byrefswap(int *x,int *y)
{
    int t;
    t=*x;
    *x=*y;
    *y=t;
}
void byvalswap(int x,int y)
{
    int t;
    t=x;
    x=y;
    y=t;
}
```

-----

27.) Write a program to sort strings using pointer exchange.

**CODING:-**

```
#include<stdio.h>
#include<conio.h>
#include<stdlib.h> /* for malloc library function */
void main()
{
    char *name[5];
    void sortbyptr(char **,int); /* function prototype */
    int i;
    clrscr();
    printf("\n enter 5 names below\n");
    for(i=0;i<5;i++)
    {
        name[i]=(char *)malloc(20);
        scanf("%s",name[i]);
    }
}
```

```

    }
    sortbyptr(name,5);
    printf("\n names in sorted order ");
    for(i=0;i<5;i++)
    {
        printf("\n%s",name[i]);
    }
    getch();
}
void sortbyptr(char **a,int n)
{
    char *t;
    int i,j;
    for(i=0;i<n-1;i++)
        for(j=0;j<n-1-i;j++)
        {
            if (strcmp(a[j],a[j+1])>0)
            {
                t=a[j];
                a[j]=a[j+1];
                a[j+1]=t;
            }
        }
}
}

```

-----

**28.)Write a program in c using pointer and function to receive a string and a character as a argument and return the no. of occurrences of this character in the string.**

**CODING:-**

```

#include<stdio.h>
#include<stdlib.h>
void main()
{
    int occur(char *,char);
    char p[40],c;
    printf("\n enter string");
    scanf("%[^\\n]",p);
    fflush(stdin);
    printf("\n enter character to count:");
    scanf("%c",&c);
    printf("\n no. of occurrences=%d:",occur(p,c));
    getch();
}
int occur(char *p,char c)
{
    int i,count=0;
    for(i=0;p[i]!='\\0';i++)
    {
        if(p[i]==c)
            count++;
    }
    return count;
}

```

29.) Write program to create structure Employee having data members to store name of employees id, salary. use pointer to structure to store data of employees and print the stored data using pointer to structure.

**CODING:-**

```
#include<stdio.h>
#include<conio.h>
#include<stdlib.h>
struct emp
{
    char name[20];
    int empid;
    int salary;
};
void main()
{
    struct emp *e;
    int i;
    e=(struct emp *)malloc(sizeof(struct emp));

    printf("\n enter details of employee : name id and salary:\n");
    scanf("%s %d %d",e->name,&e->empid,&e->salary);

    printf("\ndetails of employees : name and age:\n");
    printf("\n%s %d %d",e->name,e->empid,e->salary);

    getch();
}
```

-----

30.) Write a program to create a structure employee having data member to store name of employee, employee id, salary use pointer to structure to simulate dynamic array of structure store data of employee and print the stored data using pointer to structure.

**CODING:-**

```
#include<stdio.h>
#include<conio.h>
#include<stdlib.h>
struct emp
{
    char name[20];
    int empid;
    int salary;
};

void main()
{
    struct emp *e;
    int i;
    e=(struct emp *)malloc(sizeof (struct emp));
```

```
printf("\n Enter details of employee : name,id and salary: \n");
scanf("%s %d %d", e->name,&e->empid,&e->salary);
printf("\n Details of employee : name,id and salary: \n");
printf("%s %d %d", e->name,&e->empid,&e->salary);
getch();
}
```

---

**31.)Write a program to sort a single dimension array of integers of n elements simulated by pointer to integer.Use function for sorting the dynamic array.**

**CODING:-**

```
#include<stdio.h>
#include<conio.h>
#include<stdlib.h>
void main()
{
    int *p;
    int n,i;
    void sort(int *,int);
    printf("\n enter no. of elements");
    scanf("%d",&n);
    p= (int *) malloc (sizeof(int)*n); /* allocate 2*n bytes to generate
    an array p[n] */
    printf("\n enter %d values",n);
    for(i=0;i<n;i++)
        scanf("%d",&p[i]); /* or (p+i) */

    sort(p,n);
    printf("\n values after sorting are\n");
    for(i=0;i<n;i++)
        printf("\t%d",p[i]); /* or *(p+i) */
    getch();
}
void sort(int *p,int n)
{
    int i,j,temp;
    for(i=0;i<n-1;i++)
        for(j=0;j<n-1-i;j++)
            {
                if(p[j]>p[j+1])
                    {
                        temp=p[j];
                        p[j]=p[j+1];
                        p[j+1]=temp;
                    }
            }
}
```

32.) Write a program to sum elements of a double dimension array of integers of m rows and n columns simulated by pointer to pointer to integer. Use function for sum the elements of the dynamic array.

**CODING:-**

```
#include<stdio.h>
#include<conio.h>
#include<stdlib.h>
void main()
{
    int **p;
    int m,n,i,j;
    int s=0;
    printf("\n enter no. of rows and columns");
    scanf("%d %d",&m,&n);

    p= (int **) malloc (sizeof(int)*m);

    for(i=0;i<m;i++)
        p[i]=(int *)malloc(sizeof(int)*n);

    /* now p[m][n]; exists */

    printf("\n enter %d values are\n",m*n);
    for(i=0;i<m;i++)
        for(j=0;j<n;j++)
            scanf("%d",&p[i][j]); /* or (*(p+i)+j) */

    printf("\n the array is \n");
    for (i=0;i<m;i++)
    {
        for(j=0;j<n;j++)
        {
            printf("\t %d",p[i][j]); /* or (*(p+i)+j) */
            s=s+p[i][j];
        }
        printf("\n");
    }
    printf("\n sum of elements=%d",s);
    getch();
}
```

-----

33.) Write program to demonstrate pointer arithmetic.

**CODING:-**

```
#include<stdio.h>
void main()
{
    int a[]={1,2,3,4,5};
    int *p;
    int *q;
    int *r;
    p=&a[0];
    q=&a[2];
    int z;
```

```

/* r=p+q; not allowed */
z=p-q;
printf("\n the no. of element apart=%d",z);

p++; /* similiary p-- can be done */
printf("\n the value of 3rd element=%d",*p);

/*    p=p*3; not allowed */
/*    p=p/3; not allowed */
q=q+2; /* similarly p=p-2 allowed */
printf("\n the value of 5th element=%d",q);
getch();
}

```

-----

**34.) Write a program to demonstrate function-returning pointer.**

**CODING:-**

```

#include<stdio.h>
#include<stdlib.h>

void main()
{
    int *allocate(int);
    int *p,n,i;
    printf("\n Enter no. of elements required");
    scanf("%d",&n);
    p=allocate(n);
    for(i=0;i<n;i++)
    {
        printf("\t%d",p[i]);
    }
    getch();
}

int *allocate(int n)
{
    int i;
    int *a;
    a=(int*)malloc(sizeof(int)*n);
    for(i=0;i<n;i++)
        a[i]=2*i;
    return a;
}

```

-----

**35.) Write program to copy content of one file removing extra space between words name of files should come from command line arguments.**

**CODING:-**

```

#include<stdio.h>
#include<conio.h>
#include<dos.h>
void main(int argc,char *argv[])
{
    FILE *fp,*ft;
    if (argc!=3)
    {

```

```
printf("\n usage: programfilename  sorucefilename  targetfilename");
getch();
exit (1);
}
fp=fopen(argv[1],"r"); /* open source file in read mode */
ft=fopen(argv[2],"w");/* open target file in write mode */
/* let us check either of the file open operations failed, if failed
then terminate program */
if (fp==NULL || ft == NULL)
{
printf("\n file open operation failed");
getch();
exit (1);
}
while((ch=fgetc(fp))!=EOF)
    fputc(ch,ft);

fclose(fp);
fclose(ft);
getch();
}
```

-----

**36.)Write a program to count no. of tabs, new lines, character and space of file.**

**CODING:-**

```
#include<stdio.h>
#include<conio.h>
Void main()
{
    FILE *fp;
    char ch;
    int nol=0,not=0,nob=0,noc=0;
fp=fopen("PR1.C","r");
while(1)
{
    Ch=fgetc(fp);
    If(ch==EOF)
        Break;
    noc++;
    if(ch=='\n')
nol++;
if(ch=='\t')
not++;
}
fclose(fp);
printf("\nNumber of chracters=%d",noc);
printf("\nNumber of blanks=%d",nob);
printf("\nNumber of tabs=%d",not);
printf("\nNumber of lines=%d",nol);
getch();
}
```



37.) Write a program to read item number, rate and quantity from an inventory file and print the followings:

- A. Items having quantity >5.
- B. Total cost of inventory.

**CODING:-**

```
#include<stdio.h>
#include<conio.h>
#include<process.h>
struct item
{
    int itemnumber;
    int quantity;
    float rate;
};

void main()
{
    FILE *fp;
    struct item e;
    float cost=0;
    int n;
    clrscr();
    fp=fopen("inv","wb");
    if(fp==NULL)
    {
        printf("\n file open operation failed");
        exit (1);
    }

    while(1)
    {
        printf("\n enter itemnumber,quantity and rate:\n");
        scanf("%d %d %f",&e.itemnumber,&e.quantity,&e.rate);
        fwrite(&e,1,sizeof(e),fp);
        printf("\n enter more item if yes then enter 1,if no enter 0:");
        scanf("%d",&n);

        if(n==0)
            break;
    }
    fclose(fp);
    fp=fopen("inv","rb");
    while(fread(&e,1,sizeof(e),fp)!=0)
    {
        cost=cost+e.rate*e.quantity;
        if(e.quantity>5)
            printf("\n item number=%d,item quantity=%d,item
rate=%f",e.itemnumber,e.quantity,e.rate);
    }
    printf("\n total cost of inventory=%f",cost);
    getch();
}
```