**List of Experiments**

**1 A. Write an algorithm, flow chart and pseudocode to find the factorial of a given number.**

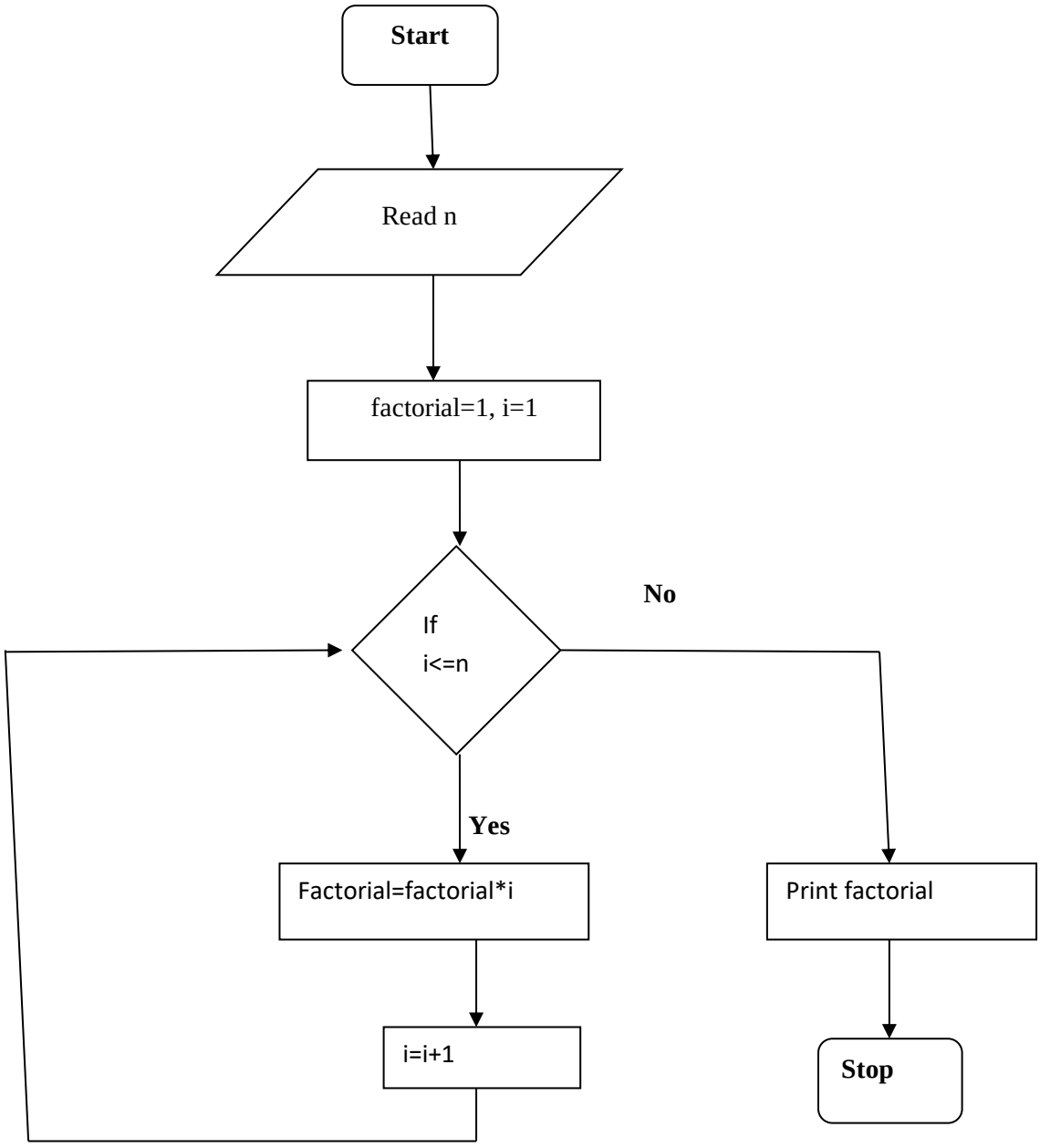
**Algorithm:**

1. Start
2. Read the value of the given number n.
3. Assign factorial ←1, i ←1
4. If i<=n else go to 5
    4.1. factorial ← factorial* i
    4.2 i ← i+1
    4.3 go to 4
5. Print factorial
6. Stop

**Pseudo code**

```
Read n
SET factorial = 1, i=1
IF (i<=n) THEN
    factorial = factorial * i
    i = i+1
END IF
PRINT factorial
```

**Flow Chart**




**1B. Write an algorithm, flow chart and pseudocode to generate Fibonacci series.**

**Algorithm:**

1. Start
2. Assign a ← 0, b ←1, c ← 0, i ←3
3. Print a ,b
4. Read n

5. If i <= n  else go to 6

5.1. c ⟵ a + b

5.2. a ⟵ b

5.3. b ⟵ c

5.4. Print c

5.5 i ⟵ i + 1

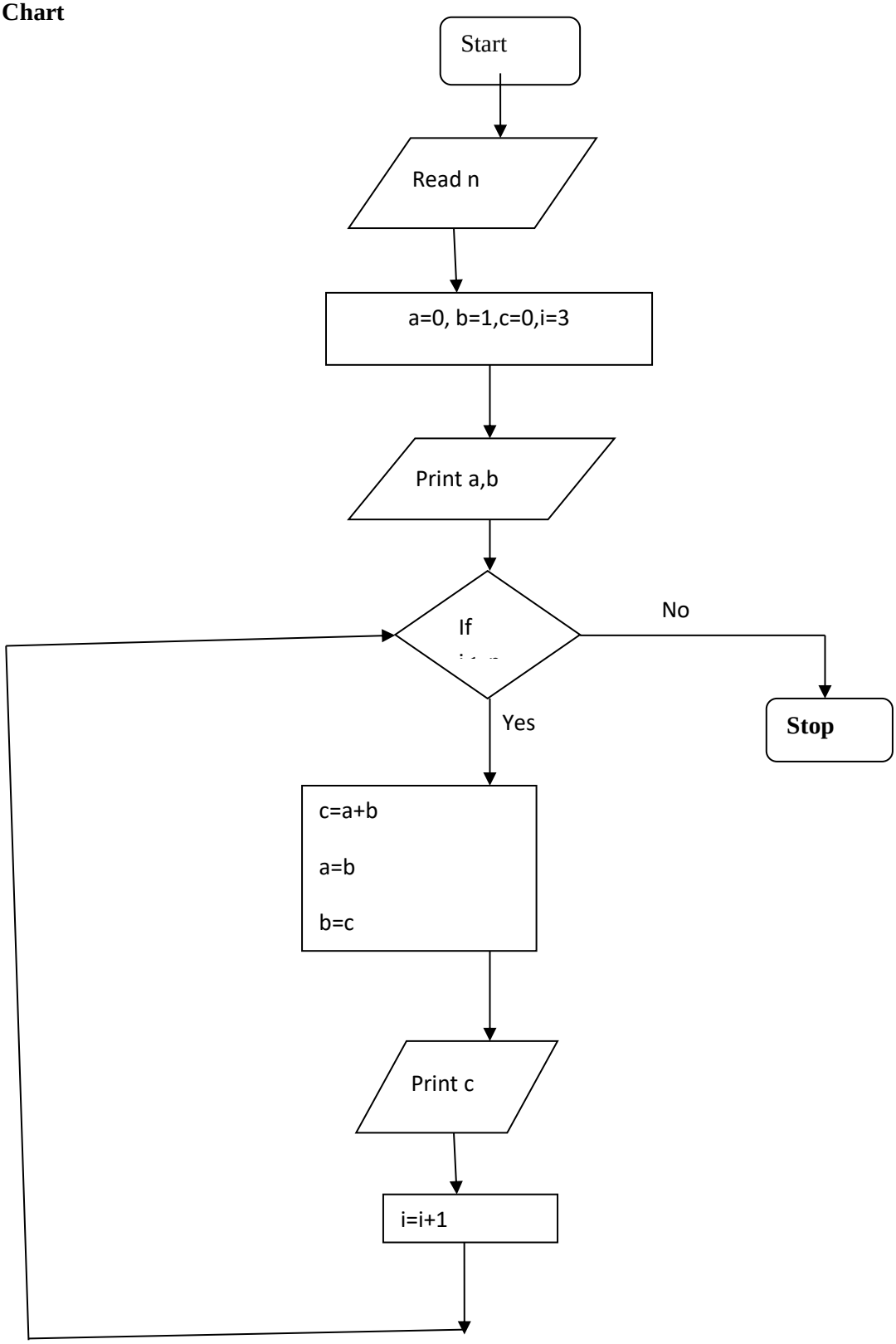
5.6 go to 5

6. Stop

**Pseudo code**

```
Read n
SET a=0, b=1, c=0, i=3
PRINT a,b
IF (i<=n)  THEN
        c = a+b
        a = b
        b = c
        PRINT c
        INCREMENT i by 1
END IF
```

**Flow Chart**


Start
Read n
a=0, b=1,c=0,i=3
Print a,b
If
No
Yes
Stop
c=a+b
a=b
b=c
Print c
i=i+1

**2A. AREA AND CIRCUMFERENCE OF CIRCLE**

```
#include<stdio.h>
#include<conio.h>
void main()
{
        float r,area,circum;
        clrscr();
        printf("\n Enter the radius of the Circle");
        scanf("%f",&r);
        area=3.14*r*r;
        circum=2*3.14*r;
        printf("\n Area=%f",area);
        printf("\n Circumference=%f",circum);
        getch();
}
```

**OUTPUT:**

Enter the radius of the Circle

5

Area=78.500000

Circumference=31.400000

**2B.To convert Fahrenheit to centigrade.**

```
 #include<stdio.h>

#include<conio.h>

void main()

{

        float cel,faren;

        clrscr();

        printf("ENTER THE CELCIUS VALUE...");

        scanf("%f",&cel);

        faren=(1.8*cel)+32;

        printf("THE FAHRENTEIET VALUE OF THE GIVEN %f CELCIUS VALUE IS
        %f",cel,faren);

        getch();

}
```

**OUTPUT**

ENTER THE CELCIUS VALUE... 23

THE FAHRENTEIET VALUE OF THE GIVEN 23.000000 CELCIUS VALUE IS 73.400002

**2C.Program to accept a year and check whether the given year is leap year or not.**

```
# include <stdio.h>
# include <conio.h>
main( )
{
int y;
clrscr( );
printf("enter a year:");
scanf("%d",&y);
if(y%4==0& &y%100!=0|| y%400==0);
printf("the above given year IS a leap year");
else
printf("the above given year IS not a leap year");
getch();
}
```

**Output**

```
enter a year:2012
the above given year IS a leap year
```

```
enter a year:2010
the above given year IS not a leap year
```

**3A.FACTORIAL OF THE GIVEN NUMBER**

```
#include<stdio.h>
#include<conio.h>
void main()
{
        int fact=1,i,num;
        clrscr();
        printf("Enter the number : ");
        scanf("%d",&num);
        for(i=1;i<=num;i++)
        {
fact=fact*i;
}
printf("The factorial of %d is : %d",num,fact);
getch();
}
```

**OUTPUT:**

Enter the Number: 5

The factorial of 5 is: 120

**3B.Program to check for prime number**

```
#include<stdio.h>
#include<conio.h>
void main()
{
        int num,i=2;
        clrscr();
        printf("ENTER THE NUMBER...");
        scanf("%d",&num);
```

```
        while(i<=num-1)
        {
                if(num%i==0)
                {
                printf("THE GIVEN NUMBER IS NOT A PRIME NUMBER");



                break;
                }
                i++;
        }
        if(i==num)
        printf("THE GIVEN NUMBER IS A PRIME");
        getch();
}
```

**OUTPUT:**

ENTER THE NUMBER 3

THE GIVEN NUMBER IS A PRIME

ENTER THE NUMBER 4

THE GIVEN NUMBER IS NOT A PRIME NUMBER.

**4A.Program To Read Three Numbers And Print The Biggest Of Given Three Numbers**

```
# include <stdio.h>
# include <conio.h>
main( )
{
int a,b,c,big=0;
clrscr( );
printf(“ENTER VALUE FOR A:”);
scanf(“%d”,&a);
printf(“ENTER VALUE FOR B:”);
scanf(“%d”,&b);
print(“ENTER VALUE FOR C:”);
scanf(“%d”,&c);
if (a>big)
big=a ;
if(b>big)
big=b;
if (c>big)
big=c;
printf (“BIGGEST OF ABOVE GIVEN THREE NUMBER IS %d”,big)
getch( );
}
```

**output**

```
ENTER VALUE FOR A:8
ENTER VALUE FOR B:3
ENTER VALUE FOR C:2
BIGGEST OF ABOVE GIVEN THREE NUMBER IS 8
```

**4B. To check for odd or even of a given number**

```
#include<stdio.h>
#include<conio.h>
void main()
{
        int num;
        clrscr();
        printf("Enter a number");
        scanf("%d",&num);
        if(num%2==0)
        {
                printf("The given number is Even");
        }
        else
        printf("The given number is Odd");
        getch();
}
```

**OUTPUT**

```
Enter a number   2
The given number is Even
Enter a number   47
The given number is Odd
```

**5A.CONVERT BINARY NUMBER TO DECIMAL NUMBER**

```
#include<stdio.h>
#include<conio.h>
void main()
{
        int bnum,digit,decimal=0,bin,base=0;
        clrscr();
        printf("\n Enter the Binary No:");
        scanf("%d",&bnum);
        bin=bnum;
                while(bnum!=0)
                {
                        digit=bnum%10;
                        decimal=decimal+(digit<<base);
                        base=base+1;
                        bnum=bnum/10;
                }
        printf("\n The Binary %d to Decimal is = %d",bin,decimal);
        getch();
}
```

**OUTPUT:**

Enter the Binary No: 100

The Binary 100 to Decimal is = 4

**5B.Program for a menu driven calculator**

```
# include <stdio.h>
# include <conio.h>
void main( )
{
int n,c,a,b,ch=1;
clrscr( );
printf("\n Enter the value for a:");
scanf("%d",&a);
printf("\n Enter the value for b:");
scanf("%d",&b);
do
 {
printf("\n Menu \n");
printf("1.addition \n");
printf("2.subtraction \n");
printf("3.multiplication \n");
printf("4.division \n");
printf("enter a choice :");
scanf("%d",&n);
switch(n)
{
case 1:
   {
    printf("addition");
    c=a+b;
    printf("the result is %d",c);
    break;
   }
case 2:
  {
    printf("subtraction");
    c=a-b;
    printf("the result is %d",c);
    break;
   }
case 3:

  {
    printf("multiplication");
    c=a*b;
    printf("the result is %d",c);
    break;
   }
case 4:
  {
    printf("division");
    c=a/b;
    printf("the result is %d",c);
    break;
```

```
   }
default:
printf("please enter the number between 0 and 4");
}
printf("\n do you want to continue(1/0)");
scanf("%d",&ch);
}while(ch==1);
getch( );


}
```

**Output**

```
Enter the value for a:2
 Enter the value for b:3

 Menu
1.addition
2.subtraction
3.multiplication
4.division
enter a choice :1
additionthe result is 5
 do you want to continue(1/0)1

 Menu
1.addition
2.subtraction
3.multiplication
4.division
enter a choice :2
subtractionthe result is -1
  do you want to continue(1/0)1

 Menu
1.addition
2.subtraction
3.multiplication
4.division
enter a choice :3
multiplicationthe result is 6
 do you want to continue(1/0)1
 Menu
1.addition
2.subtraction
3.multiplication
4.division
```

enter a choice :4

divisionthe result is 0

do you want to continue(1/0)1

Menu

1.addition

2.subtraction

3.multiplication

4.division

enter a choice :6

please enter the number between 0 and 4

do you want to continue(1/0)0

**6A. program to compute sum of the elements in an array**

```
# include <stdio.h>
# include <conio.h>
void main( )
{
int a[10][10],i,j,sum=0,m,n;
clrscr( );
printf("\n enter the value for rows and column");
scanf("%d %d",&m,&n);
for(i=0;i<m;i++)
for(j=0;j<n;j++)
{
printf("enter the  values for a[%d][%d] ", i,j);
scanf("%d%d",&a[i][j]);
}
for(i=0;i<m;i++)
{
for(j=0;j<n;j++)
{
sum=sum+a[i][j];
}
}
printf("\n The sum of the elements of the array is %d",sum);
getch( );
}
```

**output**

enter the value for rows and column 2 2
enter the  values for a[0][0]  2
enter the  values for a[0][1]  2
enter the  values for a[1][0]  2
enter the  values for a[1][1]  2

The sum of the elements of the array is  8

**6B.Program to find the largest and smallest element in an array**

```
#include<stdio.h>
#include<conio.h>
void main()
{
int a[10],n,i,large,small;
clrscr();
printf("enter the value of n\n");
scanf("%d",&n);
printf("enter the elements\n");
for(i=0;i<n;i++)
scanf("%d",&a[i]);
large=a[0];
small=a[0];
for(i=1;i<n;i++)
{
if(a[i]>large)
large=a[i];
if(a[i]<small);
small=a[i];}
printf("largest element in the array id %d\n",large);
printf("smallest element in the array is %d\n",small);
getch();
}
```

**Output**

```
enter the value of n
5
enter the elements
5
4
3
2
1
largest element in the array id 5
smallest element in the array is 1
```

**7A. Matrix Multiplication**

```
include <stdio.h>

int main()

{

  int m, n, p, q, c, d, k, sum = 0;

    int first[10][10], second[10][10], multiply[10][10];

      printf("Enter the number of rows and columns of first matrix\n");

           scanf("%d%d", &m, &n);

             printf("Enter the elements of first matrix\n");

               for (  c = 0 ; c < m ; c++ )

                       for ( d = 0 ; d < n ; d++ )

                            scanf("%d", &first[c][d]);

                                 printf("Enter the number of rows and columns osecond matrix\n");

                                  scanf("%d%d", &p, &q);

                             if ( n != p )

                                        printf("Matrices with entered orders can't be multiplied with
                                        each other.\n");

                                   else

                                         {

                                        printf("Enter the elements of second  trix\n");


                                  for ( c = 0 ; c < p ; c++ )

                                        for ( d = 0 ; d < q ; d++ )

                                        scanf("%d", &second[c][d]);

                                   for ( c = 0 ; c < m ; c++ )

                                         {

                                           for ( d = 0 ; d < p ; d++ )
```

```
                {
                 for ( k = 0 ; k < q ; k++ )
                   {
               sum = sum + first[c][k]*second[k][d];
                       }
                       multiply[c][d] = sum;
                       sum = 0;
                   }
                }
printf("Product of entered matrices:-\n");
          for ( c = 0 ; c < m ; c++ )
              {
                   for ( d = 0 ; d < p ; d++ )
                         printf("%d\t", multiply[c][d]);
                    printf("\n");
                  }
          }
```

```
return 0;

}
```

**OUTPUT**

```
Enter the number of rows and columns of first matrix
2 2
Enter the elements of first matrix
2 2
2 2
Enter the number of rows and columns of second matrix
2 2
Enter the elements of second matrix
2 2
2 2
Product of entered matrices:-
8       8
8       8
```

**7B. Program to arrange or sort the array in the ascending order**

```
#include<stdio.h>
#include<conio.h>
void main()
{
int ar[100],j,n,i,tmp;
printf(" Enter the size of the array \t");
scanf("%d",&n);
printf("Now enter the elements in the array \t");
for(i=0;i<n;i++)
{
scanf("%d",&ar[i]);
}
printf("\n Array is - ");
for(i=0;i<n;i++)
{
printf("\t %d",ar[i]);
    }
for(i=0;i<n;i++)
    {
for(j=0;j<n-i;j++)
        {
if(ar[j]>ar[j+1])
            {
                tmp=ar[j];
                ar[j]=ar[j+1];
                ar[j+1]=tmp;
            }
        }  }

    printf("\n\n Array in the ascending order is - \n");
    for(i=0;i<n;i++)
    {
        printf("\t %d",ar[i]);
    }
    getch();
}
```

**Output**

Enter the size of the array  5

Now enter the elements in the array

3

7

9

5

2

Array is - 3 7 9 5 2

Array in the ascending order is -

2 3 5 7 9

**8. ALPHABATICAL SORTING OF STRING**

```
#include<stdio.h>
#include<conio.h>
#include<string.h>
void main()
 {
  char names[50][20],temp[20];
  int n,i,j;
  clrscr();
  printf("\n how many names?");
  scanf("%d", &n);
  printf("\n Enter the %d names one by one and\n ",n);
  for(i=0;i<n;i++)
  scanf("%s",names[i]);
 for(i=0;i<n-1;i++)
   for(j=i+1;j<n;j++)
    if(strcmp(names[i],names[j])>0)
     {
       strcpy(temp,names[i]);
       strcpy(names[i],names[j]);
       strcpy(names[j],temp);
     }
   printf("\n names in alphabetical order");
  for(i=0;i<n;i++)
  printf("\n%s",names[i]);
```

```
    getch();
}
```

**OUTPUT:**

```
How many names?5
Enter the 5 names one by one and
priya
anu
young
devi
sathiya

names in alphabetical order
anu
devi
priya
sathiya
young
```

**9A.CALL BY VALUE**

```
#include<stdio.h>

#include<conio.h>

void swap(int i, int j)

{

        int t=i;

        i=j;

        j=t;

        printf("After swaping.  a: %d, b: %d\n", i, j);

}


void main()

{

        int a,b;

        void swap(int,int);

        clrscr();

        printf("Enter two numbers to swap :  \n");

        scanf("%d%d",&a,&b);

        printf("Before swaping. a: %d, b: %d\n", a, b);

        swap(a,b);

        getch();

}
```

**OUTPUT:**

Enter two numbers to swap:  26  32

Before swaping. a: 26, b: 32

After swaping.  a: 32, b: 26

**9B.CALL BY RFERENCE**

```
#include<stdio.h>

#include<conio.h>


void swap(int *i,int *j)

{

        int t=*i;

        *i=*j;

        *j=t;

}


void main()

{

        int a,b;

        clrscr();

        printf("Enter two numbers to swap :  \n");

        scanf("%d%d",&a,&b);

        printf("Before swaping. a: %d, b: %d\n", a, b);

        swap(&a,&b);

        printf("After swaping.  a: %d, b: %d\n", a, b);

        getch();

}
```

**OUTPUT:**

Enter two numbers to swap:  21  32

Before swaping. a: 21, b: 32

After swaping.  a: 32, b: 21

**10. Students mark list using Structures**

```
#include<stdio.h>
#include<conio.h>
union student
{
        int sno,m1,m2,m3,m4,m5,m6,tot;
        char name[10],grade;
        float avg;
}s[10];

void main()
{
        float avg;
        int tot,n,i;
        clrscr();
        printf("Enter the Number of student to process...");
        scanf("%d",&n);
        printf("Enter student number, Name and 6 subjects marks....\n");
        for(i=1;i<=n;i++)
        {
                printf("Enter the details of student[%d]\n",i);
                scanf("%d%s%d%d%d%d%d%d",&s[i].sno,s[i].name,&s[i].m1,&s[i].m2,&s[i].
                m3,&s[i].m4,&s[i].m5,&s[i].m6);
                s[i].tot=s[i].m1+s[i].m2+s[i].m3+s[i].m4+s[i].m5+s[i].m6;
                s[i].avg=s[i].tot/6;
                if(s[i].m1<35||s[i].m2<35||s[i].m3<35||s[i].m4<35||s[i].m5<35||s[i].m6<35)
                s[i].grade='F';
```

```
                else
                {
                        if(s[i].avg>=75)
                        s[i].grade='A';
                        else if(s[i].avg<75 && s[i].avg>=60)
                        s[i].grade='B';
                        else if(s[i].avg<60 && s[i].avg>=50)
                        s[i].grade='C';
                        else if(s[i].avg<50 && s[i].avg>=35)
                        s[i].grade='D';
                }
        }
        printf("Student Marks Lists are...\n\n");
        printf("S.No\tSNAME\tTOTAL\tAVERAGE\t  GRADE\n");
        printf("----------------\n");
        for(i=1;i<=n;i++)
        {
                printf("%d\t%s\t%d\t%f%4c",s[i].sno,s[i].name,s[i].tot,s[i].avg,s[i].grade);
                printf("\n");
        }

        getch();
}

/* OUTPUT
```

Enter the Number of student to process...

2

Enter student number, Name and 6 subjects marks....

Enter the details of student[1]

1

Ravi

78

63

56

72

85

54

Enter the details of student[2]

2

Jai

85

74

63

56

64

30

Student Marks Lists are...

S.No SNAME TOTAL AVERAGE GRADE

---

1 Ravi 408 68.000000 B

2 Jai 372 62.000000 F