Some C Programs

1. Program for Finding Your Age in Days.

```
#include<stdio.h>
#include<conio.h>
#include<dos.h>
void main()
{
        int dd,mm,yy,pdd,pmm,pyy,i,j,k,days=0;
        struct date d;
        getdate(&d) ;
        pdd=d.da_day;
        pmm=d.da_mon;
        pyy=d.da_year;

        clrscr();                       //Clear Screen

        printf("\n Enter DOB Year : ");
        scanf("%d",&yy);
        cmm:
         printf("\n Enter DOB Month : ");
         scanf("%d",&mm);
         if(mm>12)
         {
                printf("\n Invalid Month!!! \n Re-enter");
                goto cmm;
         }
         cdd:
          printf("\n Enter DOB Date : ");
          scanf("%d",&dd);
          if(dd>31||(dd>28&&mm==2)||(dd>29&&mm==2&&(yy%4==0)))
          {
                printf("\n Invalid Date!!! \n Re-enter");
                goto cdd;
          }

          if(mm>pmm)
          {
                for(i=yy+1;i<pyy;i++)
                {
                        if(i%4==0)
                                days+=366;
                        else
                                days+=365;
                }
                for(j=mm;j<12;++j)
```

```
{
        if(j==4||j==6||j==9||j==11)
                days+=30;
        else if(j==2&&pyy%4==0)
                days+=29;
        else if(j==2&&pyy%4!=0)
                days+=28;
        else
                days+=31;
}
if(dd<pdd)
{
        for(j=1;j<=pmm;++j)
        {
                if(j==4||j==6||j==9||j==11)
                        days+=30;
                else if(j==2&&pyy%4==0)
                        days+=29;
                else if(j==2&&pyy%4!=0)
                        days+=28;
                else
                        days+=31;
        }
        for(k=dd;k<=pdd;k++)
                days++;
}
else
{
        for(j=1;j<pmm;++j)
        {
                if(j==4||j==6||j==9||j==11)
                        days+=30;
                else if(j==2&&pyy%4==0)
                        days+=29;
                else if(j==2&&pyy%4!=0)
                        days+=28;
                else
                        days+=31;
        }
        j--;
        if(j==4||j==6||j==9||j==11)
        {
                for(k=dd;k<31;k++)
                        days++;
        }
        else if(j==2&&pyy%4==0)
        {
                for(k=dd;k<=29;k++)
                        days++;
```

```
                }
                else if(j==2&&pyy%4!=0)
                {
                        for(k=dd;k<29;k++)
                                days++;
                }
                else
                {
                        for(k=dd;k<=31;k++)
                                days++;
                }
                for(k=1;k<pdd;k++)
                        days++;
        }
}
else
{
        for(i=yy+1;i<=pyy;i++)
        {
                if(i%4==0)
                        days+=366;
                else
                        days+=365;
        }
        if(dd<pdd)
        {
                for(j=mm;j<=pmm;++j)
                {
                        if(j==4||j==6||j==9||j==11)
                                days+=30;
                        else if(j==2&&pyy%4==0)
                                days+=29;
                        else if(j==2&&pyy%4!=0)
                                days+=28;
                        else
                                days+=31;
                }
                for(k=dd;k<=pdd;k++)
                        days++;
        }
        else
        {
                for(j=mm;j<pmm;++j)
                {
                        if(j==4||j==6||j==9||j==11)
                                days+=30;
                        else if(j==2&&pyy%4==0)
                                days+=29;
                        else if(j==2&&pyy%4!=0)
```

```
                                        days+=28;
                                else
                                        days+=31;
                        }
                        j--;
                        if(j==4||j==6||j==9||j==11)
                        {
                                for(k=dd;k<31;k++)
                                        days++;
                        }
                        else if(j==2&&pyy%4==0)
                        {
                                for(k=dd;k<=29;k++)
                                        days++;
                        }
                        else if(j==2&&pyy%4!=0)
                        {
                                for(k=dd;k<29;k++)
                                        days++;
                        }
                        else
                        {
                                for(k=dd;k<=31;k++)
                                        days++;
                        }
                        for(k=1;k<pdd;k++)
                                days++;
                }
        }
        printf("\n Your Age : %d days",days);
        getch();
}
```

2. Program to Print Value in Exponential Form.

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

void main()
{
        float num;
        clrscr();
        printf("\n\n Enter any Number : ");
        scanf("%f",&num);
        printf("\n\n Float Form = %f",num);
        printf("\n\n Exponentail Form = %e",num);
        getch();
}
```

3. Program to Simulate 3 Laws of Motion.

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

void main()
{
        float u,a,t,s,v;
        clrscr();
        printf("\n Enter Inital Velocity : ");
        scanf("%f",&u);
        printf("\n Enter Acceleration : ");
        scanf("%f",&a);
        printf("\n Enter Time Taken : ");
        scanf("%f",&t);
        v=u+(a*t);
        s=(u*t)+(1/2*pow((a*t),2));
        printf("\n\n First Law Of Motion : ");
        printf("\n v = u +  a  * t ");
        printf("\n %.2f  = %.2f + %.2f * %.2f ",v,u,a,t);
        printf("\n\n Second Law Of Motion : ");
        printf("\n s = u * t + 1/2 (a*t)^2");
        printf("\n  %.2f = %.2f * %.2f + 1/2 (%.2f * %.2f )^2 ",s,u,t,a,t);
        printf("\n\n Third Law Of Motion : ");
        printf("\n v^2 - u^2 = 2 * a * s ");
        printf("\n %.2f ^2 - %.2f ^2 = 2 * %.2f * %.2f ",v,u,a,s);
        getch();
}
```

4. Program to compute Perimeter and Area of Rectangle.

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

void main()
{
        int area,peri,l,b;
        clrscr();
        printf("\n Enter Length : ");
        scanf("%d",&l);
        printf("\n Enter Breath : ");
        scanf("%d",&b);
        area=l*b;
        peri=2*(l+b);
        printf("\n      Area = %d ",area);
        printf("\n Perimeter = %d ",peri);
        getch();
}
```

5. Program to perform summation of 3 digit number.

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

void main()
{
        int sum,n,a,b,c;

        clrscr();

        printf("\n Enter Any 3-digit Number : ");
        scanf("%d",&n);
        a=n%10;
        n/=10;
        b=n%10;
        n/=10;
        c=n%10;
        sum=a+b+c;
        printf("\n Sum of digits = %d ",sum);
        getch();
}
```

6. Program to calculate distance between two points.

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

void main()
{
        int x1,y1,x2,y2;
        float dist;

        clrscr();

        printf("\n Enter x1 : ");
        scanf("%d",&x1);
        printf("\n Enter y1 : ");
        scanf("%d",&y1);
        printf("\n Enter x2 : ");
        scanf("%d",&x2);
        printf("\n Enter y2 : ");
        scanf("%d",&y2);
        dist=sqrt(pow((x2-x1),2)+pow((y2-y1),2));
        printf("\n\n Distance = %f ",dist);
        getch();
}
```

7. Program to print the following Pattern :

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

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

void main()
{
        int i,j,n=4;
        clrscr();
        printf("\n Pattern is :\n");
        for(i=0;i<7;i++)
        {
                printf("\n");
                for(j=0;j<7;j++)
                {
                        if(i==0||j==0||i==6||j==6)
                                printf("%d ",n);
                        else if(i==1||j==1||i==5||j==5)
                                printf("%d ",n-1);
                        else if(i==2||j==2||i==4||j==4)
                                printf("%d ",n-2);
                        else
                                printf("%d ",n-3);
                }
        }
        getch();
}
```

Conditional Operator Programs

8. WAP TO CHECK WHETHER NUMBER IS DIVISIBLE BY 5 AND 11 OR NOT USING CONDITIONAL OPERATOR.

```
#include<stdio.h>
#include<conio.h>
void main()
{
        int num;
        clrscr();
        printf("\n Enter any integer : " );
        scanf("%d",&num);
        (num%5==0&&num%11==0)?printf("\n Divisible"):printf("\n Not Divisible ");
        getch();
}
```

9. PROGRAM TO FIND GIVEN YEAR IS LEAP YEAR OR NOT USING CONDITIONAL OPERATOR.

```
#include<stdio.h>
#include<conio.h>
void main()
{
        int year;
        clrscr();
        printf("\n Enter Year : " );
        scanf("%d",&year);
        ((year%4==0&&year%100!=0)||(year%400==0))?printf("\n  Leap  Year"):printf("\n
Not Leap year ");
        getch();
}
```

10. PROGRAM TO FIND MAXIMUM OF 3 NUMBERS USING CONDITIONAL OPERATOR.

```
#include<stdio.h>
#include<conio.h>
void main()
{
        int a,b,c,max;
        clrscr();
        printf("\n Enter 1st Number : ");
        scanf("%d",&a);
        printf("\n Enter 2nd Number  : ");
        scanf("%d",&b);
        printf("\n Enter 3rd Number : ");
        scanf("%d",&c);
        max=(a>b&&a>c)?a:(b>c)?b:c;
        printf("\n Maximum value = %d",max);
        getch();
}
```

Conditional Statement Programs (Simple if, if-else, if-else-if ladder, switch)

11. Program to count total number of notes in given amount.

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

void main()
{
	int amount,n100n,n2000n,n500n,n50n,n10n,n200n,n20n,n5c,n2c,n1c,rupees;

	clrscr();

	n2000n=n500n=n200n=n100n=n50n=n20n=n10n=n5c=n2c=n1c=0;

	printf("\n Enter Amount : ");
	scanf("%d",&amount);

	rupees=amount;

	if(rupees>=2000)
	{
		n2000n=rupees/2000;
		rupees%=2000;
	}

	if(rupees>=500)
	{
		n500n=rupees/500;
		rupees%=500;
	}

	if(rupees>=200)
	{
		n200n=rupees/200;
		rupees%=200;
	}
	if(rupees>=100)
	{
		n100n=rupees/100;
		rupees%=100;
	}

	if(rupees>=50)
	{
```

```
        n50n=rupees/50;
        rupees%=50;
    }

    if(rupees>=20)
    {
        n20n=rupees/20;
        rupees%=20;
    }

    if(rupees>=10)
    {
        n10n=rupees/10;
        rupees%=10;
    }

    if(rupees>=5)
    {
        n5c=rupees/5;
        rupees%=5;
    }

    if(rupees>=2)
    {
        n2c=rupees/2;
        rupees%=2;
    }

    if(rupees==1)
        n1c=1;

    printf("\n %d Contains No. of ",amount);
    printf("\n\t   Two  Thousand Rupees Notes = %d ",n2000n);
    printf("\n\t   Five Hundred  Rupees Notes = %d ",n500n);
    printf("\n\t   Two  Hundered Rupees Notes = %d ",n200n);
    printf("\n\t   One  Hundered Rupees Notes = %d ",n100n);
    printf("\n\t          Fifty Rupees Notes = %d ",n50n);
    printf("\n\t         Twenty Rupees Notes = %d ",n20n);
    printf("\n\t           Ten Rupees Notes = %d ",n10n);
    printf("\n\t          Five Rupees Coins = %d ",n5c);
    printf("\n\t           Two Rupees Coins = %d ",n2c);
    printf("\n\t           One Rupee  Coins = %d ",n1c);

    getch();
}
```

12. WAP TO FIND ALL ROOTS OF A QUADRATIC EQUATION.

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

void main()
{
        int a,b,c,d;
        float r1,r2;

        clrscr();

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

        d=(pow(b,2))-(4*a*c);

        if(d==0)
        {
                printf("\n Both roots are equal. ");
                r1=-b/(2.0*a);
                r2=r1;
                printf("\n First  root  = %f",r1);
                printf("\n Second root = %f",r2);
        }
        else if(d>0)
        {
                printf("\n Both roots are real and unique. ");
                r1=(-b+sqrt(d))/(2*a);
                r2=(-b-sqrt(d))/(2*a);
                printf("\n First  root = %f",r1);
                printf("\n Second root = %f",r2);
        }
        else
                printf("\n Roots are imaginary ");

        getch();
}
```

13. Program to input any character and check whether it is alphabet, digit or special character.

```
#include<stdio.h>
#include<conio.h>
void main()
{
        char ch;
        clrscr();
        printf("\n Enter any character : ");
        scanf("%c",&ch);

        if((ch>='A'&&ch<='Z') | | (ch>='a'&&ch<='z'))
                printf("\n It is Alphabet");
        else if(ch>='0'&&ch<='9')
                printf("\n It is Digit");
        else
                printf("\n It is Special Character ");
        getch();
}
```

14. Program to find grade of student.

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

void main()
{
        int pct;
        char grade;
        clrscr();
        printf("\n Enter Percentage : ");
        scanf("%d",&pct);

        if(pct>90)
                grade='A';
        else if(pct>80)
                grade='B';
        else if(pct>70)
                grade='C';
        else if(pct>60)
                grade='D';
        else if(pct>50)
                grade='E';
        else
                grade='F';
        printf("\n Grade = %c ",grade);
        getch();
}
```

15. Program to convert Celsius to Fahrenheit and vise-versa.

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

void main()
{
        int ch;
        float f,c;

        clrscr();

        printf("\n Choose your option : "
                "\n 1. Convert Faherenheit to Celsius "
                "\n 2. Convert Celsius to Faherenheit \t Option : ");
        scanf("%d",&ch);

        switch (ch)
        {
                case 1 : printf("\n Enter Temperature in F : ");
                        scanf("%f",&f);
                        c=5*(f-32)/9;
                        printf("\n Celsius = %f ",c);
                        break;

                case 2 : printf("\n Enter Temperature in C : ");
                        scanf("%f",&c);
                        f=(c*9/5)+32;
                        printf("\n Faherenheit = %f ",f);
                        break;

                default : printf("\n Invalid Choice!!! ");
        }

        getch();
}
```

16. Write Menu Driven Program To Compute Area Of Different Geometrical Shapes.

```
#include<stdio.h>
#include<conio.h>
#define PI 3.14
void main()
{
        int l,b,h,opt;
        float area;
        printf("\n 1. Circle \n 2. Triangle \n 3. Square \n 4. Rectangle \n 5. Rhombus \n 6. Parallelogram \n Choose your Option : ");
        scanf("%d",&opt);
        switch (opt)
        {
                case 1: printf("\n Enter Radius : ");
                        scanf("%d",&l);
                        area=PI*l*l;
                        break;
                case 2: printf("\n Enter Base Length : ");
                        scanf("%d",&b);
                        printf("\n Enter Height : ");
                        scanf("%d",&h);
                        area=0.5*b*h;
                        break;
                case 3: printf("\n Enter Length : ");
                        scanf("%d",&l);
                        area=l*l;
                        break;
                case 4: printf("\n Enter Length : ");
                        scanf("%d",&l);
                        printf("\n Enter Breadth : ");
                        scanf("%d",&b);
                        area=l*b;
                        break;
                case 5: printf("\n Enter Length Of Major Diagonal : ");
                        scanf("%d",&l);
                        printf("\n Enter Length Of Minor Diagonal : ");
                        scanf("%d",&b);
                        area=(l*b)/2;
                        break;
                case 6: printf("\n Enter Base Length : ");
                        scanf("%d",&b);
                        printf("\n Enter Height : ");
                        scanf("%d",&h);
                        area=b*h;
                        break;
                default:printf("\n Invalid Choice Entered!!!");
        }
        printf("\n Area = %.2f ",area);
        getch();
}
```

Series Programs

17. Program to print 1 to n Armstrong Numbers.

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

void main()
{
	int i,j,num,n,r,rem,count,res;

	clrscr();

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

	printf("\n Armstrong Numbers are : \n");
	for(i=1;i<=n;i++)
	{
		num=i;
		count=res=0;
		while(num!=0)
		{
			count++;
			num/=10;
		}
		num=i;
		while(num!=0)
		{
			r=1;
			rem=num%10;
			for(j=0;j<count;j++)
				r*=rem;
			res+=r;
			num=num/10;
		}
		if(i==res)
			printf("%d ",i);
	}

	getch();
}
```

18. Program to print 1 to n Strong Numbers.

```
#include<stdio.h>
#include<conio.h>
#include<math.h>
void main()
{
        int i,j,num,n,r,rem,res;
        clrscr();
        printf("\n Enter n : ");
        scanf("%d",&n);
        printf("\n Strong Numbers are : \n");
        for(i=1;i<=n;i++)
        {
                num=i;
                res=0;
                while(num!=0)
                {
                        r=1;
                        rem=num%10;
                        for(j=1;j<=rem;j++)
                                r*=j;
                        res+=r;
                        num=num/10;
                }
                if(i==res)
                        printf("%d ",i);
        }
        getch();
}
```

19. Program to print 1 to n Perfect Numbers.

```
#include<stdio.h>
#include<conio.h>
void main()
{
        int i,j,n,res;
        printf("\n Enter n : ");
        scanf("%d",&n);
        printf("\n Perfect Numbers are : \n");
        for(i=1;i<=n;i++)
        {
                res=0;
                for(j=1;j<i;j++)
                        if(i%j==0)
                                res+=j;
                if(i==res)
                        printf("%d ",i);
        }
        getch();
}
```

Dynamic Memory Allocation Programs

20. Program to perform dynamic memory allocation Using Malloc

```
#include<stdio.h>
#include<stdlib.h>
#include<conio.h>
void main()
{
        int* ptr;
        int n,i;
        printf("\n Enter no. of elements : ");
        scanf("%d",&n);
        ptr=(int*)malloc(n*sizeof(int));
        for(i=0;i<n;i++)
        {
                scanf("%d",&ptr[i]);
        }

        printf("\n The Elements are : ");
        for(i=0;i<n;i++)
        {
                printf("%d ",ptr[i]);
        }
        getch();
}
```

21. Program to perform dynamic memory allocation using calloc

```
#include<stdio.h>
#include<stdlib.h>
#include<conio.h>
void main()
{
        int* ptr;
        int n=1,i,t;
        clrscr();
        printf("\n Enter no. of test cases : ");
        scanf("%d",&t);
        for(i=0;i<t;i++)
        {
                ptr=(int*)calloc(n++,sizeof(int));
                for(i=0;i<n;i++)
                        scanf("%d",&ptr[i]);
                printf("\n The Elements are : ");
                for(i=0;i<n;i++)
                        printf("%d ",ptr[i]);
        }
        getch();
}
```

22. Program to create memory for int, char and float variable at run time.

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

void main()
{
        int *i;
        char *c;
        float *f;

        clrscr();

        i=(int *)malloc(sizeof(int));
        c=(char *)malloc(sizeof(char));
        f=(float *)malloc(sizeof(float));

        printf("\n Enter integer value : ");
        scanf("%d",i);

        *c='A';

        printf("\n Enter float value : ");
        scanf("%f",f);

        printf("\n\n Values are : \n");

        printf("\n Integer value : %d",*i);

        printf("\n Character value : %c",*c);

        printf("\n Float value : %f",*f);

        getch();
}
```

Function Programs

23. Program to find power of a given number using functions.

```
#include<stdio.h>
#include<conio.h>
#include<math.h>
int power(int,int);
void main()
{
        int num,x,result;
        clrscr();
        printf("\n Enter Number : ");
        scanf("%d",&num);
        printf("\n Enter Power : ");
        scanf("%d",&x);
        result=power(num,x);
        printf("\n Result = %d",result);
        getch();
}
int power(int p,int q)
{
        return pow(p,q);
}
```

24. Program to find cube of a given number using functions.

```
#include<stdio.h>
#include<conio.h>
int cube(int);
void main()
{
        int num;
        clrscr();
        printf("\n Enter Number : ");
        scanf("%d",&num);
        printf("\n Cube = %d",cube(num));
        getch();
}

int cube(int n)
{
        return n*n*n;
}
```

25. Program to check whether a given number is even or odd using functions.

```
#include<stdio.h>
#include<conio.h>
int check(int);
void main()
{
        int num,flag;
        clrscr();
        printf("\n Enter Number : ");
        scanf("%d",&num);
        flag=check(num);
        if(flag==0)
                printf("\n %d is Even Number.",num);
        else
                printf("\n %d is Odd Number. ",num);
        getch();
}
int check(int n)
{
        if(n%2==0)
                return 0;
        else
                return 1;
}
```

26. Program to find factorial of a given number using functions.

```
#include<stdio.h>
#include<conio.h>
#include<math.h>
int fact(int);
void main()
{
        int num,result;
        clrscr();
        printf("\n Enter Number : ");
        scanf("%d",&num);
        result=power(num);
        printf("\n Result = %d",result);
        getch();
}
int power(int x)
{
        int i,f=1;
        for(i=1;i<=x;++i)
                f*=i;
        return f;
}
```

27. Program to find Area and Volume of Geometric Shapes Using Functions.

```
#include<stdio.h>
#include<conio.h>
#include<math.h>
#define PI 3.14159
float AV(int);
void main()
{
        int opt;
        clrscr();
        while(opt!=6)
        {
                printf("\n 1.  Cube              "
                    "\n 2.  Cuboid            "
                    "\n 3.  Cone              "
                    "\n 4.  Cylinder          "
                    "\n 5.  Sphere            "
                    "\n 6.  Exit              "
                    "\n     Enter Your Option : ");
                scanf("%d",&opt);
                printf("\n Area = %.2f\n\n",AV(opt));
        }
}
float AV(int x)
{
        float l,b,h,r,res,vol;
        switch(x)
        {
                case 1: printf("\n Enter Length : ");
                        scanf("%f",&l);
                        res=6*l*l;
                        vol=l*l*l;
                        break;

                case 2: printf("\n Enter Length : ");
                        scanf("%f",&l);
                        printf("\n Enter Breadth : ");
                        scanf("%f",&b);
                        printf("\n Enter Height : ");
                        scanf("%f",&h);
                        res=2*((l*b)+(b*h)+(h*l));
                        vol=l*b*h;
                        break;

                case 3: printf("\n Enter Radius : ");
                        scanf("%f",&r);
                        printf("\n Enter Height : ");
```

```
                scanf("%f",&h);
                res=PI*r*(r+sqrt((h*h)+(r*r)));
                vol=PI*r*r*(h/3);
                break;

        case 4: printf("\n Enter Radius : ");
                scanf("%f",&r);
                printf("\n Enter Height : ");
                scanf("%f",&h);
                res=(2*PI*r*h)+(2*PI*r*r);
                vol=PI*r*r*h;
                break;

        case 5: printf("\n Enter Radius : ");
                scanf("%f",&r);
                res=4*PI*r*r;
                vol=(4/3)*PI*r*r*r;
                break;

        case 6: printf("\n Exiting!!!");
                getch();
                exit(0);
                break;
        default:printf("\n Invalid Option !!!");
    }
    printf("\n Volume = %.2f",vol);
    return res;
}
```

Recursion Function Programs

28. Program to perform LCM using recursion function

```
#include<stdio.h>
#include<conio.h>
int LCM(int x,int y)
{
	static int temp=1;
	if(temp%x==0&&temp%y==0)
		return temp;
	else
	{
		temp++;
		LCM(x,y);
		return temp;
	}
}
void main()
{
	int a,b;
	printf("\n Enter 1st Integer : ");
	scanf("%d",&a);
	printf("\n Enter 2nd Integer : ");
	scanf("%d",&b);
	printf("\n LCM = %d",LCM(a,b));
	getch();
}
```

29. Program to perform GCD using recursion function

```
#include<stdio.h>
#include<conio.h>
int GCD(int x,int y)
{
	if(x>y)
		GCD(x-y,y);
	else if(y>x)
		GCD(x,y-x);
	else
		return x;
}
void main()
{
	int a,b;
	printf("\n Enter 1st Number : ");
	scanf("%d",&a);
	printf("\n Enter 2nd Number : ");
	scanf("%d",&b);
	printf("\n GCD = %d",GCD(a,b));
	getch();
}
```

30. Program to perform FACTORIAL using recursion function

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

int fact(int x)
{
        if(x==1||x==0)
                return 1;
        else
                return (x*fact(x-1));
}

void main()
{
        int num;
        clrscr();
        printf("\n Enter Number : ");
        scanf("%d",&num);
        printf("\n Factorial = %d",fact(num));
        getch();
}
```

31. Program to perform FIBONACCI SERIES using recursion function

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

int fib(int x)
{
        if(x==0)
                return 0;
        else if(x==1)
                return 1;
        else
                return fib(x-1)+fib(x-2);
}

void main()
{
        int num,i;
        clrscr();
        printf("\n Enter No. of terms : ");
        scanf("%d",&num);
        printf("\n Fibonacci Series is : \n");
        for(i=0;i<num;i++)
                printf("%d ",fib(i));
        getch();
}
```

32. Program to perform POWER of a given number using recursion function

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

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

void main()
{
        int num,p;

        clrscr();

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

        printf("\n Enter Power : ");
        scanf("%d",&p);

        printf("\n Result = %d",power(num,p));
        getch();
}
```

String Programs

33. Write a C program to convert uppercase into lower case letters.

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

void main()
{
        char str[200];

        clrscr();

        printf("\n Enter String : ");
        gets(str);
        strlwr(str);
        printf("\n Final String : ");
        puts(str);

        getch();
}
```

34. Write a C program to convert uppercase into lower case letters without using string functions.

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

void main()
{
        char str[200];
        int i;

        clrscr();

        printf("\n Enter String : ");
        gets(str);
        for(i=0;str[i]!='\0';i++)
                if(str[i]>='A'&&str[i]<='Z')
                        str[i]+=32;
        printf("\n Final String : ");
        puts(str);

        getch();
}
```

35. Write a C program to convert lowercase into uppercase letters.

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

void main()
{
        char str[200];

        clrscr();

        printf("\n Enter String : ");
        gets(str);

        strupr(str);

        printf("\n Final String : ");
        puts(str);

        getch();
}
```

36. Write a C program to convert lowercase into uppercase letters without using string functions.

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

void main()
{
        char str[200];
        int i;

        clrscr();

        printf("\n Enter String : ");
        gets(str);

        for(i=0;str[i]!='\0';i++)
                if(str[i]>='a'&&str[i]<='z')
                        str[i]-=32;

        printf("\n Final String : ");
        puts(str);

        getch();
}
```

37. Program to reverse a string without using string functions

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

void main()
{
        char str[800],temp;
        int i,j,count=0;

        clrscr();

        printf("\n Enter String  : ");
        gets(str);

        for(i=0;str[i]!='\0';++i)
                count++;

        for(i=0,j=count-1;i<count/2;++i,--j)
        {
                temp=str[i];
                str[i]=str[j];
                str[j]=temp;
        }

        printf("\n Final String = ");
        puts(str);

        getch();
}
```

38. Program to Calculate the Frequency of Letters in a String without Using Header file <string.h>.

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

void main()
{
	int i,j,ctr1[100]={0},ctr2[100]={0};
	char str[100];

	clrscr();

	printf("\n Enter a String : ");
	gets(str);

	for(i=0;str[i]!='\0';i++)
	{
		if(str[i]>='a'&&str[i]<='z')
		{
			j=str[i]-'a';
			ctr1[j]++;
		}
		else if(str[i]>='A'&&str[i]<='Z')
		{
			j=str[i]-'A';
			ctr2[j]++;
		}
	}

	printf("\n Frequency of Letters: \n\n");
	for(i=0;i<26;i++)
		if(ctr1[i]!=0)
			printf("%c = %d \t",i+'a',ctr1[i]);

	printf("\n\n");

	for(i=0;i<26;i++)
		if(ctr2[i]!=0)
			printf("%c = %d \t",i+'A',ctr2[i]);

	getch();
}
```

Pointer Programs

39. Program to swap 2 numbers using call by reference.

```
#include<stdio.h>
#include<conio.h>
void swap(int *,int *);
void main()
{
        int a,b;
        clrscr();
        printf("\n Enter a : ");        scanf("%d",&a);
        printf("\n Enter b : ");        scanf("%d",&b);
        swap(&a,&b);
        printf("\n\n\t a = %d \t b = %d",a,b);
        getch();
}
void swap(int *p,int *q)
{
        int temp;
        temp=*p;
        *p=*q;
        *q=temp;
}
```

40. Program to add 2 numbers using pointers.

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

void main()
{
        int a,b,*x,*y;
        clrscr();
        x=&a;
        y=&b;
        printf("\n Enter a : ");
        scanf("%d",x);
        printf("\n Enter b : ");
        scanf("%d",y);
        printf("\n a+b = %d",*x+*y);
        getch();
}
```

41. Program to Access Elements of an Array using Pointers.

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

void main()
{
        int arr[100],n,i;
        clrscr();
        printf("\n Enter no. of elements : ");
        scanf("%d",&n);
        printf("\n Enter Elements : \n");
        for(i=0;i<n;i++)
                scanf("%d",&(*(arr+i)));
        printf("\n Array Elements are : ");
        for(i=0;i<n;i++)
                printf("%d ",*(arr+i));
        getch();
}
```

42. Program to find the sum of Elements of an Array using Pointers.

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

void main()
{
        int arr[100],n,i,sum=0;
        clrscr();
        printf("\n Enter no. of elements : ");
        scanf("%d",&n);
        printf("\n Enter Elements : \n");
        for(i=0;i<n;i++)
                scanf("%d",&(*(arr+i)));
        printf("\n Array Elements are : ");
        for(i=0;i<n;i++)
        {
                printf("%d ",*(arr+i));
                sum+=*(arr+i);
        }
        printf("\n\n SUM = %d ",sum);
        getch();
}
```

Structure Programs

43. Program to declare a structure template for the information of an entity "pen"(name, colour of ink, price, length in inches) read information about 10 pens, print all of them and find the average of all pens .

```
#include<stdio.h>
#include<conio.h>
struct pens
{
        char name[20];
        char color[20];
        int price;
        int length;
};
void main()
{
        struct pens p[10];
        int i,avg1=0,avg2=0;
        printf("\n Enter Pen Details : \n");
        for(i=0;i<10;i++)
        {
                printf("\n Pen %d : ",i+1);
                printf("\n\t Name : ");
                scanf("%s",p[i].name);
                printf("\n\t Colour : ");
                scanf("%s",p[i].color);
                printf("\n\t Price : ");
                scanf("%d",&p[i].price);
                printf("\n\t Length : ");
                scanf("%d",&p[i].length);
        }
        printf("\n Details of each pen are : \n");
        for(i=0;i<10;i++)
        {
                printf("\n Pen %d : ",i+1);
                printf("\n\t Name : %s",p[i].name);
                printf("\n\t Colour : %s",p[i].color);
                printf("\n\t Price : %d",p[i].price);
                printf("\n\t Length : %d",p[i].length);
                avg1+=p[i].price;       avg2+=p[i].length;
                getch();
        }
        avg1=avg1/10;           avg2=avg2/10;
        printf("\n Average Price = %d\n Average Length = %d ",avg1,avg2);
        getch();
}
```

44. Program to store Information of a student Using Structures.

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

struct student
{
        int roll;
        char name[80];
        int marks;
};

void main()
{
        int i,j,n;
        struct student s[30];

        clrscr();

        printf("\n Enter no. of students : ");
        scanf("%d",&n);

        printf("\n Enter Details of Students : ");
        for(i=0;i<n;i++)
        {
                printf("\n\n Student %d : ",i+1);
                printf("\n Enter Roll No. : ");
                scanf("%d",&s[i].roll);
                printf("\n Enter Name : ");
                scanf("%s",s[i].name);
                printf("\n Enter Marks : ");
                scanf("%d",&s[i].marks);
        }

        printf("\n Students Details are :- \n");
        for(i=0;i<n;i++)
        {
                printf("\n\n Student %d : \n",i+1);
                printf("\n Roll No. : %d",s[i].roll);
                printf("\n     Name : %s",s[i].name);
                printf("\n    Marks : %d",s[i].marks);
        }

        getch();
}
```

Matrix Programs

45. Program to perform Multiplication of Matrix

```
#include<stdio.h>
#include<conio.h>
void main()
{
	int a[10][10],b[10][10],c[10][10],i,j,k,r1,c1,r2,c2;
	clrscr();
	printf("\n Enter no. of Rows in Matrix A : ");
	scanf("%d",&r1);
	printf("\n Enter no. of Coloumns in Matrix A : ");
	scanf("%d",&c1);
	printf("\n Enter no. of Rows in Matrix B : ");
	scanf("%d",&r2);
	printf("\n Enter no. of Coloumns in Matrix B : ");
	scanf("%d",&c2);
	if(r2!=c1)
		printf("\n Multiplication is not possible");
	else
	{
		printf("\n Enter Elements in Matrix A : ");
		for(i=0;i<r1;i++)
			for(j=0;j<c1;j++)
				scanf("%d",&a[i][j]);
		printf("\n Enter Elements in Matrix B : ");
		for(i=0;i<r1;i++)
			for(j=0;j<c1;j++)
				scanf("%d",&b[i][j]);

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

46. Program to perform Sum of Secondary diagonal elements.

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

void main()
{
        int a[10][10],i,j,size,sum;

        clrscr();

        sum=0;
        printf("\n Enter Size : ");
        scanf("%d",&size);

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

        printf("\n Array Elements are : \n");
        for(i=0;i<size;i++)
        {
                printf("\n");
                for(j=0;j<size;j++)
                {
                        if(i+j==size-1)
                                sum+=a[i][j];
                        printf("\t %d",a[i][j]);
                }
        }

        printf("\n\n Sum of Secondary Diagonal Elements = %d",sum);
        getch();
}
```

File Programs

47. Program to Create a File And Write Data

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

void main()
{
        char data[1000],c;
        FILE *fPtr;

        clrscr();

        fPtr=fopen("file.txt","w+");
    //  fPtr=fopen("file.txt","r");

        if(fPtr==NULL)
        {
                printf("\n Unable to Create File. \n");
                getch();
                exit(0);
        }

        printf("\n Enter contents to Store in File : \n");
        fgets(data,1000,stdin);

        fputs(data,fPtr);

        c=fgetc(fPtr);

        while(c!=EOF)
        {
                printf("%c",c);
                c=fgetc(fPtr);
        }

        fclose(fPtr);

        printf("\n File Created And Saved Successfully!!!");

        getch();
}
```

48. Program to append multiple lines at the end of file.

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

void main()
{
        FILE *ptr;
        char ch[100];

        clrscr();

        ptr=fopen("Temp.txt","a");

        if(ptr==NULL)
                printf("\n Can't Open ");
        else
        {
                printf("\n Enter any String : ");
                scanf("%s",ch);
                fputs(ch,ptr);
        }
        fclose(ptr);
        getch();
}
```

49. Program to copy contents from one file into other.

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

void main()
{
        FILE *ptr1,*ptr2;
        char ch;
        clrscr();
        ptr1=fopen("Temp.txt","r");
        ptr2=fopen("ABCD.txt","w");
        if(ptr1==NULL||ptr2==NULL)
                printf("\n File Cannot Open ");
        else
        {
                while((ch=fgetc(ptr1))!=EOF)
                        fputc(ch,ptr2);
                printf("\n Copied ");
                fcloseall();
        }
        getch();
}
```

50. Program to count the no. of vowels in a text file ABC.txt.

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

void main()
{
        char str1[100],str2[100];
        clrscr();
        printf("\n Enter any string (max. 100) :");
        gets(str1);
        strcpy(str1,str2);
        printf("\n Copied String is : ");
        puts(str2);
        getch();
}
```

51. Program to store 5 lines of alphanumeric values in a file Lines.txt.

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

void main()
{
        FILE *fptr;
        char ch[80];
        int i;
        clrscr();
        fptr=fopen("Lines.txt","w");
        if(fptr==NULL)
                printf("\n Cannot Open");
        else
        {
                printf("\n Enter lines of alphanumeric : \n");
                for(i=0;i<5;i++)
                {
                        printf("\n Line %d : ",i+1);
                        gets(ch);
                        fputs(ch,fptr);
                        fputc('\n',fptr);
                }
                fclose(fptr);
        }
        getch();
}
```

52. WAP to read 5 lines containing alphanumeric symbols from a file. Print the number of vowels and Numerals in the file, as an output of your program.

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

void main()
{
        FILE *fptr;
        char ch,c,str[800];
        int i,j,ctr1=0,ctr2=0;
        clrscr();
        fptr=fopen("Lines.txt","r");
        if(fptr==NULL)
                printf("\n Cannot Open");
        else
        {
                for(i=0;i<5;i++)
                {
                        fgets(str,' \n',fptr);
                        for(j=0;str[j]!='\0';j++)
                        {
                                ch=str[j];
                                if(ch=='A'||ch=='a'||ch=='E'||ch=='e'||ch=='I'||ch=='i'||ch=
                                ='O'||ch=='o'||ch=='U'||ch=='u')
                                        ctr1++;
                                if(ch>='0'&&ch<='9')
                                        ctr2++;
                        }

                }
                printf("\n No. of Vowels  = %d",ctr1);
                printf("\n No. of Numbers = %d",ctr2);
                fclose(fptr);
        }
        getch();
}
```