UNIVERSITY OF ENGINEERING & MANAGEMENT, KOLKATA

C ASSIGNMENTS

All programs need to be submitted on 28th Oct 2015 by writing in hand written format in A4 sheet. Flowcharts, algorithms, source codes and outputs are required.

All the programs need to be implemented using function

1. **C Program to Print a Sentence**

```
#include<stdio.h>
#include<conio.h>
void  sentence(int );
void main()
{
        int l;
        clrscr();
        printf("\n Enter sentence length");
        scanf("%d",&l);
        sentence(l);
        getch();
}
void  sentence(int l)
{
        int k; char  a;
        printf("\n Enter a sentence,ended with a fullstop(.)");
        for(k=0;(k<=l)&&(a!='.');k++)
        {
                scanf("%c",&a);
                printf("%c",a);
        }
}
```

2. **C Program to Print a Integer Entered by a User**

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

```
}
void  num(int b)
{
        printf(“%d”,b);
}
```

3. C Program to Add Two Integers different function call.

```
#include<stdio.h>
#include<conio.h>
int num();
int add(int,int);
void main()
{
        int s,x,y;
        x=num();
        y=num();
        s=add(x,y);
        printf("Sum = %d",s);
        getch();
}
int  num()
{
        int a;
        printf("\n Enter  number");
        scanf("%d",&a);
        return(a);
}
int add(int a, int b)
{
        return (a+b);
}
```

4. C Program to Multiply two Floating Point Numbers

```
#include<stdio.h>
#include<conio.h>
float mult(float,float);
void main()
{
        float a1,a2,a3;
        clrscr();
        printf(“\n Enter two  no:”);
        scanf(“%f%f”,&a1,&a2);
        a3=mult(a1,a2);
        printf(“%f”,a3);
        getch();
```

```
}
float  mult(float a1,float a2)
{
        float a;
        a=a1 * a2;
        return(a);
}
```

5. C Program to Find ASCII Value of a Character

```
#include<stdio.h>
#include<conio.h>
int  val(char );
void main()
{
        int b; char a;
        clrscr();
        printf("\n Enter  character:");
        scanf("%c",&a);
        b=val(a);
        printf("Ascii of %c = %d",a,b);
        getch();
}
int  val(char a)
{
        int b;
        b=(int)a;
        return(b);
}
```

6. C Program to Find Quotient and Remainder of Two Integers Entered by User

```
#include<stdio.h>
#include<conio.h>
int quotient(int,int);
int remainder(int,int);
void main()
{
        int a,b;
        clrscr();
        printf("\n enter divisor and divider: ");
        scanf("%d%d",&a,&b);
        printf("\nQuotient=%d",quotient(a,b));
        printf("\nRemainder=%d",remainder(a,b));
        getch();
}
int quotient(int a,int b)
```

```
{
        return (a/b);
}
int remainder(int a,int b)
{
        return (a%b);
}
```

7. C Program to Find Size of int, float, double and char of Your System

```
#include<stdio.h>
#include<conio.h>
int sizeofint(int);
int sizeofchar(char);
int sizeoffloat(float);
int sizeofdouble(double);
int main()
{
        char a; int b; float c; double d;
        printf("\n Enter a Character ");
        scanf("%c",&a);
        printf(" Char = %d Byte\n",sizeofchar(a));

        printf("\n Enter an Integer ");
        scanf("%d",&b);
        printf(" Int = %d Byte\n",sizeofint(b));

        printf("\n Enter a Floating no ");
        scanf("%f",&c);
        printf(" Float = %d Byte\n",sizeoffloat(c));

         printf("\n Enter an Double ");
        scanf("%lf",&d);
        printf(" Double = %d Byte\n",sizeofdouble(d));

        getch();
}
int sizeofchar(char n)
{
        return (sizeof(n));
}
int sizeofint(int n)
{
         return (sizeof(n));
}
```

```
int sizeoffloat(float n)
{
        return (sizeof(n));
}
int sizeofdouble(double n)
{
        return (sizeof(n));
}
```

8. C Program to Demonstrate the Working of Keyword long

```
#include<stdio.h>
#include<conio.h>
long add(int,int);
void main()
{
        int a,b;long c;
        clrscr();
        printf("\n Enter two number");
        scanf("%d%d",&a,&b);
        c=add(a,b);
        printf("%ld",c);
}
long add(int a,int b)
{
        long s;
        s=a+b;
        return(s);
}
```

9. C Program to Swap two Numbers without third variable

```
#include<stdio.h>
#include<conio.h>
void  swap(int,int);
void main()
{
        int a,b;
        clrscr();
        printf(“Enter two no: ”);
        scanf(“%d%d”,&a,&b);
        swap(a,b);
        getch();
}
void  swap(int x,int y)
{
        printf("\n Before swaping a=%d  b=%d",x,y);
```

```
        x=x+y;
        y=x-y;
        x=x-y;
        printf("\n After swaping a=%d  b=%d",x,y);
}
```

10. C Program to Swap two Numbers without third variable and arithmetic operator.

```
#include<stdio.h>
#include<conio.h>
void  swap(int,int);
void main()
{
        int a,b;
        printf("Enter two no: ");
        scanf("%d%d",&a,&b);
        swap(a,b);
        getch();
}
void  swap(int x,int y)
{
        printf("\n Before swaping a=%d  b=%d",x,y);
        x=x^y;
        y=x^y;
        x=x^y;
        printf("\n After swaping a=%d  b=%d",x,y);
}
```

11. C Program to Check Whether a Number is Even or Odd

```
#include<stdio.h>
#include<conio.h>
void  check(int);
void main()
{
        int a;
        printf("Enter a no");
        scanf("%d",&a);
        check(a);
        getch();
}
void  check(int x)
{
        if(x%2==0)
                printf("\n even");
        else
                printf("\n Odd");
```

```
}
```

12. C Program to Check Vowel or Consonant using if else.

```
#include<stdio.h>
#include<conio.h>
void  check(char);
void main()
{
        char b;
        clrscr();
        printf("enter  character");
        scanf("%c",&b);
        check(b);
        getch();
}
void check(char  x)
{
        int d;
        d=(int)x;
        if (((d>=65)&&(d<=90)) |||((d>=97)&&(d<=122)))
        {
                if((x=='a'||x=='e'||x=='I'||x=='o'||x=='u')||(x=='A' || x=='E'|| x=='I'| x=='O' || x=='U'))
                        printf("\n VOWEL");
                else
                        printf("\n CONSONANT");
        }
        else
                printf("invalid");
}
```

13. C Program to Check Vowel or Consonant using switch case.

```
#include<stdio.h>
#include<conio.h>
void  check(char);
void main()
{
        char b;
        clrscr();
        printf("enter  character");
        scanf("%c",&b);
        check(b);
        getch();
}
void check(char  x)
{
```

```
        int d;
        d=(int)x;
        if (((d>=65)&&(d<=90)) ||((d>=97)&&(d<=122)))
        {
                switch(x)
                {
                        case ‘A’:
                        case ‘a’:
                        case ‘E’:
                        case ‘e’:
                        case ‘I’:
                        case ‘i’:
                        case ‘O’:
                        case ‘o’:
                        case ‘U’:
                        case ‘u’:
                                printf(“\n VOWEL”);
                                break;
                        default:
                                printf(“\n CONSONANT”);
                }
        }
        else
                printf(“invalid”);
}
```

14. C Program to Find the Largest Number Among Three Numbers using if else.

```
#include<stdio.h>
#include<conio.h>
int big(int,int,int);
void main()
{
        int a,b,c;
        clrscr();
        printf("Enter 3 numbers: \n");
        scanf("%d %d %d",&a,&b,&c);
        printf("%d is largest",big(a,b,c));
        getch();
}
int big(int a,int b,int c)
{
        if(a>=b)
        {
                if(a>=c)
```

```
                return a;
        else
                return c;
    }
    else if(b>=c)
        return b;
    else
        return c;
}
```

15. C Program to Find the Largest Number Among Three Numbers using ternary operator.

```
#include<stdio.h>
#include<conio.h>
int big(int,int,int);
void main()
{
    int a,b,c;
    clrscr();
    printf("Enter 3 numbers: \n");
    scanf("%d %d %d",&a,&b,&c);
    printf("%d is largest",big(a,b,c));
    getch();
}
int big(int a,int b,int c)
{
    return (a>b?(b>c?a:c):(c>a?b:c));
}
```

16. C Program to Find the Largest Number Among Five Numbers using ternary operator.

```
#include<stdio.h>
#include<conio.h>
int big(int,int,int,int,int);
int main()
{
    int a,b,c,d,e;
    printf("Enter 5 numbers: \n");
    scanf("%d %d %d %d %d",&a,&b,&c,&d,&e);
    printf("%d is largest",big(a,b,c,d,e));
    getch();
}
int big(int a,int b,int c,int d,int e)
{
    return (((a>b)?a:b)>((c>d)?c:d))?(((a>b)?a:b)>e?((a>b)?a:b):e):(((c>d)?c:d)>e?((c>d)?c:d):e);
}
```

17. C program to Find all Roots of a Quadratic equation

```
#include<stdio.h>
#include<conio.h>
#include<math.h>
void root(int,int,int);
int main()
{
	int a,b,c;
	printf("Enter a, b and c of ax^2+bx+c=0");
	scanf("%d%d%d",&a,&b,&c);
	root(a,b,c);
	getch();
}
void root(int a,int b,int c)
{
	double x,y,d;
	d = sqrt(b * b - 4 * a * c);
	if(d<0)
	{
		printf("Real number root is not possible");
	}
	else
	{
		x = (-b + d) / 2 * a;
		y = (-b - d) / 2 * a;
	}
	 printf("1st Root = %lf\n2nd Root = %lf",x,y);
}
```

18. C Program to Check Leap Year

```
#include<stdio.h>
#include<conio.h>
void leapyr(int);
void main()
{
	int yr;
	clrscr();
	printf("Enter  year: \n");
	scanf("%d",&yr);
	leapyr(yr);
	getch();
}
void leapyr(int yr)
{
	if((yr%400==0)||(yr%100!=0)&&(yr%4==0))
```

```
                printf(“leap year”);
        else
                printf(“\n not a leap year”);
}
```

19. C Program to Check Whether a Number is Positive or Negative or Zero.

```
#include<stdio.h>
#include<conio.h>
void num(int);
void main()
{
        int a;
        clrscr();
        printf("Enter  number: \n");
        scanf("%d ",&a);
        num(a);
        getch();
}
void num(int a)
{
        if(a==0)
                printf(“\n Zero”);
        else
        {
                if(a>0)
                        printf(“Positive”);
                else
                        printf(“Negative”);
        }
}
```

20. C Program to Check Whether a Character is an Alphabet or not

```
#include<stdio.h>
#include<conio.h>
int check(char);
void main()
{
        char b;
        clrscr();
        printf("enter  character");
        scanf("%c",&b);
        if(check(b)==1)
                 printf("Alphabet");
        else
                printf("Not Alphabet");
```

```
        getch();
}
int  check(char  x)
{
        int d;
        d=(int)x;
        if (((d>=65)&&(d<=90)) || ((d>=97)&&(d<=122)))
                return 1;
        else
                return 0;
 }
```

21. C Program to Calculate Sum of Natural Numbers

```
#include<stdio.h>
#include<conio.h>
int sum(int);
void main( )
{
        int n,s;
        clrscr();
        printf("\n Enter number");
        scanf("%d",&n);
        s=sum(n);
        printf("\n sum=%d",s);
        getch( );
}
int sum(int n)
{
        int i,s=0;
        for(i=0;i<=n;i++)
                s=s+i;
        return(s);
}
```

22. C Program to Find Factorial of a Number using iterative function.

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

```
        printf("\n factorial of %d =%ld",n,f);
        getch();
}
long fact(int n)
{
        int i;
        long s=1;
        for(i=1;i<=n;i++)
                s=s*i;
        return(s);
}
```

23. C program to Generate Multiplication Table

```
#include<stdio.h>
#include<conio.h>
void mult(int,int);
void main()
{
        int n,t;
        clrscr();
        printf("\n Enter Multiplication Table of: ");
        scanf("%d",&n);
        printf("\n Enter no of term required: ");
        scanf("%d",&t);
        mult(n,t);
        getch();
}
void mult(int n, int t)
{
        int i=1,s;
        for(i=1;i<=t;i++)
        {
                s=n*i;
                printf("\n %d  * %2d  = %5d",n,i,s);
        }
}
```

24. C Program to Display Fibonacci Series using iterative function.

```
#include<stdio.h>
#include<conio.h>
void fibo(int);
int main()
{
        int n;
        clrscr();
```

```
        printf("\n enter range");
        scanf("%d",&n);
        fibo(n);
        getch();
}
void fibo(int n)
{
        int f1=0,f2=1,f3=1;
        printf("%3d%3d",f1,f2);
        while((f1+f2)<=n)
        {
                f3=f1 + f2;
                printf("%3d",f3);
                f1=f2;
                f2=f3;
        }
}
```

25. C Program to Find HCF of two Numbers iterative function.

```
#include<stdio.h>
#include<conio.h>
int hcf(int,int);
void main()
{
        int a,b,c;
        clrscr();
        printf("\n enter two number");
        scanf("%d%d",&a,&b);
        c=hcf(a ,b);
        printf("\n hcf is %d",c);
        getch();
}
int  hcf(int a,int b)
{
        int i,n,r;
        n=a>b? b:a;
        for(i=1;i<=n;i++)
        {
                if((a%i==0)&&(b%i==0))
                        r=i;
        }
        return(r);
}
```

26. C Program to Find LCM of two Numbers iterative function.

```
#include<stdio.h>
#include<conio.h>
int lcm(int,int);
void main()
{
        int a,b,c;
        clrscr();
        printf("\n enter two number");
        scanf("%d%d",&a,&b);
        c=lcm(a ,b);
        printf("\n lcm is %d",c);
        getch();
}
int  lcm(int a,int b)
{
        int i,n,r,l;
        n=a>b? b:a;
        for(i=1;i<=n;i++)
        {
                if((a%i==0)&&(b%i==0))
                r=i;
        }
        l=(a*b)/r;
        return(l);
}
```

27. C Program to Count Number of Digits of an Integer

```
#include<stdio.h>
#include<conio.h>
int count(int);
void main()
{
        int n;
        clrscr();
        printf("\n Enter number");
        scanf("%d",&n);
        printf("%d",count(n));
        getch();
}
int count(int n)
{
        int i=0;
        if(n==0)
                return 1;
```

```
        else
        {
                while(n>0)
                {
                        n=n/10;
                        i++;
                }
                return i;
        }
}
```

28. C Program to Reverse a Number

```
#include<stdio.h>
#include<conio.h>
int reverse(int);
void main()
{
        int f, num;
        clrscr();
        printf("\n Enter number");
        scanf("%d",&num);
        f=reverse(num);
        printf("%d",f);
        getch();
}
int reverse(int n)
{
        int  r,s=0;
        while(n>0)
        {
                r=n%10;
                s=s*10+r;;
                n=n/10;
        }
        return(s);
}
```

29. C program to Calculate the Power of a Number

```
#include<stdio.h>
#include<conio.h>
long power(int,int);
void main()
{
        int n,p;
        long s;
```

```
        printf("\n enter  number  and power");
        scanf("%d%d",&n,&p);
        s=power(n,p);
        printf(" %d^%d =%ld",n,p,s);
        getch();
}
long power(int n,int p)
{
        int i;
        long m=1;
        for(i=1;i<=p;i++)
        {
                m=m*n;
        }
        return(m);
}
```

30. C Program to Check Whether a Number is Palindrome or Not

```
#include<stdio.h>
#include<conio.h>
int palindrome(int);
void main()
{
        int f,num;
        clrscr();
        printf("\n Enter a number");
        scanf("%d",&num);
        f=palindrome(num);
        if(f==0)
                printf("\n not palindrome");
        else
                printf("palindrome");
        getch();
}
int  palindrome(int n)
{
        int r,s=0,a;
        a=n;
        while(n>0)
        {
                r=n%10;
                s=s*10+r;;
                n=n/10;
        }
```

```
        if(s==a)
                return 1;
        else
                return 0;
}
```

31. C Program to Check Whether a Number is Prime or Not

```
#include<stdio.h>
#include<conio.h>
#include<math.h>
int prime(int x);
void main()
{
        int n,f;
        clrscr();
        printf(" ENTER THE ANY NUMBER \n");
        scanf("%d",&n);
        f=prime(n);
        if(f==1)
                printf(" NUMBER IS PRIME \n");
        else
                printf("NUMBER IS NOT PRIME \n");
        getch();
}
int prime(int x)
{
        int i,a,r=0;
        a=sqrt(x);
        if((x==1)||(x==2))
                return(0);
        else
        {
                for(i=2;i<=a;i++)
                if(x%i==0)
                                return(0);
                return(1);
    }
}
```

32. C Program to Display Prime Numbers Between Two Intervals

```
#include<stdio.h>
int check_prime(int num);
void main()
{
        int n1,n2,i,flag;
```

```
        printf("Enter two numbers(intervals): ");
        scanf("%d %d",&n1, &n2);
        printf("Prime numbers between %d and %d are: ", n1, n2);
        for(i=n1+1;i<n2;++i)
        {
                flag=check_prime(i);
                if(flag==0)
                printf("%d ",i);
        }
        getch();
}
int check_prime(int num)
{
        int j,flag=0;
        for(j=2;j<=num/2;++j)
        {
                if(num%j==0)
                {
                        flag=1;
                        break;
                }
        }
        return flag;
}
```

33. C program to Check Armstrong Number

```
#include <stdio.h>
int armstrong(int n);
void main()
{
        char c;
        int n,temp=0;
        printf("Eneter a positive integer: ");
        scanf("%d",&n);
         temp=armstrong(n);
        if(temp==1)
                printf("\n%d is an Armstrong number.", n);
        else
                printf("\n%d is not an Armstrong number.",n);
        getch();
}
int armstrong(int n)
{
        int num=0, temp, flag=0;
```

```
        temp=n;
        while(n!=0)
        {
                num+=(n%10)*(n%10)*(n%10);
                n/=10;
        }
        if (num==temp)
                flag=1;
        return flag;
}
```

34. C program to Check Perfect Number

```
#include<stdio.h>
int perfect(int);
void main()
{
        int n,re;
        clrscr();
        printf("Enter a number: ");
        scanf("%d",&n);
        re= perfect(n);
        if(re==n)
                printf("\n\nYes!\n   It is a perfect number.\n\n");
        else
                printf("\n\nNo! \n  It is not a Perfect Number.\n\n");
                getch();
}
int perfect(int a)
{
        int sum=0,i;
        for(i=1;i<a;i++)
        {
                if(a%i==0)
                {
                        sum=sum+i;
                }
        }
        return sum;
}
```

35. C program to check Strong Number.

```
#include<stdio.h>
int strong(int);
void main()
{
```

```
        int n,st;
        clrscr();
        printf("Enter a number: ");
        scanf("%d",&n);
        st=strong(n);
        if(n==st)
                printf("%d is a strong number",n);
        else
                printf("%d is not a strong number",n);
        getch();
}
int strong(int num)
{
        int i,f,r,sum=0;
        while(num)
        {
                i=1,f=1;
                r=num%10;
                while(i<=r)
                {
                        f=f*i;
                        i++;
                }
                sum=sum+f;
                num=num/10;
        }
}
```

36. C program to find super digit of a given number.

```
#include<stdio.h>
#include<conio.h>
int super(int);
void main()
{
        int n;
        clrscr();
        printf("Enter a number: ");
        scanf("%d",&n);
        printf("Super digit of %d is %d",n,super(n));
        getch();
}
int super(int n)
{
        int x,s=0;
```

```
        while(n>=10)
        {
                x=n;s=0;
                while(x>0)
                {
                        s=s+(x%10);
                        x=x/10;
                }
                n=s;
        }
        return s;
}
```

37. C Program to Display Armstrong Number Between Two Intervals

```
#include <stdio.h>
int armstrong(int);
void main()
{
        int n1, n2, i, temp, num, rem;
        clrscr();
        printf("Enter two numbers(intervals): ");
        scanf("%d %d", &n1, &n2);
        printf("Armstrong numbers between %d an %d are: ", n1, n2);
        for(i=n1; i<=n2; i++)
        {
                if(armstrong(i)==1)
                        printf("%d ",i);
        }
         getch();
}
int armstrong(int n)
{
        int num=0, temp, flag=0;
        temp=n;
        while(n!=0)
        {
                num+=(n%10)*(n%10)*(n%10);
                n/=10;
        }
        if (num==temp)
                flag=1;
        return flag;
}
```

38. C program to Display Prime Factors of a Number

```
#include<stdio.h>
void primefactor(int);
void main()
{
	int n;
	printf("\nEnter a number:");
	scanf("%d",&n);
	primefactor(n);
	getch();
}
void primefactor(int num)
{
	int i=1,j,k;
	while(i<=num)
	{
		k=0;
		if(num%i==0)
		{
			j=1;
			while(j<=i)
			{
				if(i%j==0)
				k++;
				j++;
			}
			if(k==2)
				printf("\n%d is a prime factor",i);
		}
		i++;
	}
}
```

39. C program to Print Pyramids and Triangles in C programming using Loops

```
#include <stdio.h>
#include <conio.h>
void pyramid(int);
void main()
{
	int n;
	printf("Enter hight of pyramid");
	scanf("%d",&n);
	pyramid(n);
	getch();
}
```

```
void pyramid(int line)
{
	int i, j, k, space;
	space=line;
	for (i=0;i<=line;i++)
	{
		for (k=0;k<space;k++)
		{
			printf(" ");
		}
		for (j=0;j<2*i-1;j++)
		{
			printf("*");
		}
		space--;
		printf("\n");
	}
}
#include <stdio.h>
#include <conio.h>
void triangle(int);
void main()
{
	int n;
	printf("Enter hight of triangle");
	scanf("%d",&n);
	triangle(n);
	getch();
}
void triangle(int rows)
{
	int i, j;
	for(i=1;i<=rows;++i)
	{
		for(j=1;j<=i;++j)
		{
			printf("* ");
		}
		printf("\n");
	}
}
```

40. C program to Make a Simple Calculator to Add, Subtract, Multiply or Divide Using switch...case

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

```
#include<conio.h>
void calc();
void main()
{
	calc();
	getch();
}
void calc()
{
	char o;
	float num1,num2;
	printf("Enter operator either + or - or * or divide : ");
	scanf("%c",&o);
	printf("Enter two operands: ");
	scanf("%f%f",&num1,&num2);
	switch(o)
	{
		case '+':
			printf("%.1f + %.1f = %.1f",num1, num2, num1+num2);
			break;
		case '-':
			printf("%.1f - %.1f = %.1f",num1, num2, num1-num2);
			break;
		case '*':
			printf("%.1f * %.1f = %.1f",num1, num2, num1*num2);
			break;
		case '/':
			printf("%.1f / %.1f = %.1f",num1, num2, num1/num2);
			break;
		default:
			printf("Error! operator is not correct");
	}
}
```

41. C Program to Display Prime Numbers Between Intervals by Making Function

```
#include <stdio.h>
#include<conio.h>
void prime(int,int);
void main()
{
	int n1, n2;
	clrscr();
	printf("Enter two numbers(intevals): ");
	scanf("%d %d", &n1, &n2);
```

```
        printf("Prime numbers between %d and %d are: ", n1, n2);
        prime(n1,n2);
        getch();
        return 0;
}
void prime(int n1, int n2)
{
        int i, j, flag;
        for(i=n1+1; i<n2; ++i)
        {
                flag=0;
                for(j=2; j<=i/2; ++j)
                {
                        if(i%j==0)
                        {
                                flag=1;
                                break;
                        }
                }
                if(flag==0)
                printf("%d ",i);
        }
}
```

42. C Program to Check Prime and Armstrong Number by Making Function

```
#include <stdio.h>
int prime(int n);
int armstrong(int n);
void main()
{
        char c;
        int n,temp=0;
        clrscr();
        printf("Eneter a positive integer: ");
        scanf("%d",&n);
        printf("Enter P to check prime and  A to check Armstrong number: ");
        c=getch();
        if (c=='p' || c=='P')
        {
                temp=prime(n);
                if(temp==1)
                        printf("\n%d is a prime number.", n);
                else
                        printf("\n%d is not a prime number.", n);
```

```
        }
        if (c=='a' || c=='A')
        {
                temp=armstrong(n);
                if(temp==1)
                        printf("\n%d is an Armstrong number.", n);
                else
                        printf("\n%d is not an Armstrong number.",n);
        }
        getch();
}
int prime(int n)
{
        int i, flag=1;
        for(i=2; i<=n/2; ++i)
        {
                if(n%i==0)
                {
                        flag=0;
                        break;
                }
        }
        return flag;
}
int armstrong(int n)
{
        int num=0, temp, flag=0;
        temp=n;
        while(n!=0)
        {
                num+=(n%10)*(n%10)*(n%10);
                n/=10;
        }
        if (num==temp)
        flag=1;
        return flag;
}
```

43. C program to Check Whether a Number can be Express as Sum of Two Prime Numbers

```
#include <stdio.h>
int prime(int n);
void main()
{
        int n, i, flag=0;
```

```
        clrscr();
        printf("Enter a positive integer: ");
        scanf("%d",&n);
        for(i=2; i<=n/2; ++i)
        {
                if (prime(i)!=0)
                {
                        if ( prime(n-i)!=0)
                        {
                                printf("%d = %d + %d\n", n, i, n-i);
                                flag=1;
                        }
                }
        }
        if (flag==0)
        printf("%d can't be expressed as sum of two prime numbers.",n);
        getch();
}
int prime(int n)
{
        int i, flag=1;
        for(i=2; i<=n/2; ++i)
        if(n%i==0)
        flag=0;
        return flag;
}
```

44. C program to Find Sum of Natural Numbers using Recursion.

```
#include<stdio.h>
int add(int n);
void main()
{
        int n;
        clrscr();
        printf("Enter an positive integer: ");
        scanf("%d",&n);
        printf("Sum = %d",add(n));
        getch();
}
int add(int n)
{
        if(n==0)
           return 1;
           else
```

```
        return n+add(n-1);
}
```

45. C program to Calculate Factorial of a Number Using Recursion

```
#include<stdio.h>
long int factorial(int n);
void main()
{
        int n;
        printf("Enter an positive integer: ");
        scanf("%d",&n);
        printf("Factorial of %d = %ld", n, factorial(n));
        getch();
}
long int factorial(int n)
{
        if(n==0)
                return 1;
        else
                return n*factorial(n-1);
}
```

46. C Program to Find H.C.F Using Recursion

```
#include <stdio.h>
#include <conio.h>
int hcf(int n1, int n2);
void main()
{
        int n1, n2;
        clrscr();
        printf("Enter two positive integers: ");
        scanf("%d%d", &n1, &n2);
        printf("H.C.F of %d and %d = %d", n1, n2, hcf(n1,n2));
        getch();
}
int hcf(int n1, int n2)
{
        if (n2!=0)
                return hcf(n2, n1%n2);
        else
                return n1;
}
```

47. C program to Reverse a Sentence Using Recusrion

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

```
void Reverse();
void main()
{
        clrscr();
        printf("Enter a sentence: ");
        Reverse();
        getch();
}
void Reverse()
{
        char c;
        scanf("%c",&c);
        if( c != '\n')
        {
                Reverse();
                printf("%c",c);
        }
}
```

48. C program to Calculate the Power of a Number Using Recursion

```
#include <stdio.h>
int power(int n1,int n2);
void main()
{
        int base, exp;
        printf("Enter base number: ");
        scanf("%d",&base);
        printf("Enter power number(positive integer): ");
        scanf("%d",&exp);
        printf("%d^%d = %d", base, exp, power(base, exp));
        getch();
}
int power(int base,int exp)
{
        if(exp==0)
                return 1;
        else
                return (base*power(base,exp-1));
}
```

49. C Program to Convert Binary Number to Decimal and Decimal to Binary

```
#include <stdio.h>
#include <conio.h>
#include <math.h>
int binary_decimal(int n);
```

```
int decimal_binary(int n);
void main()
{
	int n;
	char c;
	clrscr();
	printf("Instructions:\n");
	printf("1. Enter alphabet 'd' to convert binary to decimal.\n");
	printf("2. Enter alphabet 'b' to convert decimal to binary.\n");
	scanf("%c",&c);
	if (c =='d' || c == 'D')
	{
		printf("Enter a binary number: ");
		scanf("%d", &n);
		printf("%d in binary = %d in decimal", n, binary_decimal(n));
	}
	if (c =='b' || c == 'B')
	{
		printf("Enter a decimal number: ");
		scanf("%d", &n);
		printf("%d in decimal = %d in binary", n, decimal_binary(n));
	}
	getch();
}
int decimal_binary(int n)
{
	int rem, i=1, binary=0;
	while (n!=0)
	{
		rem=n%2;
		n/=2;
		binary+=rem*i;
		i*=10;
	}
	return binary;
}
int binary_decimal(int n)
{
	int decimal=0, i=0, rem;
	while (n!=0)
	{
		rem = n%10;
		n/=10;
```

```
            decimal += rem*pow(2,i);
            ++i;
        }
        return decimal;
}
```

50. C Program to Convert Octal Number to Decimal and Decimal to Octal

```
#include <stdio.h>
#include <conio.h>
#include <math.h>
int decimal_octal(int n);
int octal_deciaml(int n);
void main()
{
        int n;
        char c;
        clrscr();
        printf("Instructions:\n");
        printf("1. Enter alphabet 'o' to convert decimal to octal.\n");
        printf("2. Enter alphabet 'd' to convert octal to decimal.\n");
        scanf("%c",&c);
        if (c =='d' || c == 'D')
        {
            printf("Enter an octal number: ");
            scanf("%d", &n);
            printf("%d in octal = %d in decimal", n, octal_decimal(n));
        }
        if (c =='o' || c == 'O')
        {
            printf("Enter a decimal number: ");
            scanf("%d", &n);
            printf("%d in decimal = %d in octal", n, decimal_octal(n));
        }
        getch();
}
int decimal_octal(int n)
{
        int rem, i=1, octal=0;
        while (n!=0)
        {
            rem=n%8;
            n/=8;
            octal+=rem*i;
            i*=10;
```

```
        }
        return octal;
}
int octal_decimal(int n)
{
        int decimal=0, i=0, rem;
        while (n!=0)
        {
                rem = n%10;
                n/=10;
                decimal += rem*pow(8,i);
                ++i;
        }
        return decimal;
}
```

51. C Program to Convert Binary Number to Octal and Octal to Binary

```
#include<stdio.h>
#include<conio.h>
#include<math.h>
int binary_octal(int n);
int octal_binary(int n);
void main()
{
        int n;
        char c;
        clrscr();
        printf("Instructions:\n");
        printf("1. Enter alphabet 'o' to convert binary to octal.\n");
        printf("2. Enter alphabet 'b' to convert octal to binary.\n");
        scanf("%c",&c);
        if ( c=='o' || c=='O')
        {
                printf("Enter a binary number: ");
                scanf("%d",&n);
                printf("%d in binary = %d in octal", n, binary_octal(n));
        }
        if ( c=='b' || c=='B')
        {
                printf("Enter a octal number: ");
                scanf("%d",&n);
                printf("%d in octal = %d in binary",n, octal_binary(n));
        }
        getch();
```

```
}
int binary_octal(int n)
{
	int octal=0, decimal=0, i=0;
	while(n!=0)
	{
		decimal+=(n%10)*pow(2,i);
		++i;
		n/=10;
	}
	i=1;
	while (decimal!=0)
	{
		octal+=(decimal%8)*i;
		decimal/=8;
		i*=10;
	}
	return octal;
}
int octal_binary(int n)
{
	int decimal=0, binary=0, i=0;
	while (n!=0)
	{
		decimal+=(n%10)*pow(8,i);
		++i;
		n/=10;
	}
	i=1;
	while(decimal!=0)
	{
		binary+=(decimal%2)*i;
		decimal/=2;
		i*=10;
	}
	return binary;
}
```

52. C Program to Calculate Standard Deviation

```
#include<stdio.h>
#include<conio.h>
#include<math.h>
#define MAXSIZE 100
void sd();
```

```
void main( )
{
        clrscr();
        sd();
        getch();
}
void sd()
{
        int i,n;
        float value[MAXSIZE],deviation,sum,sumsqr,mean,variance,stddeviation;
        sum = sumsqr = n = 0 ;
        printf("Input values: input -1 to end \n");
        for (i=1; i< MAXSIZE ; i++)
        {
                scanf("%f", &value[i]);
                if (value[i] == -1)
                        break;
                sum += value[i];
                n += 1;
        }
        mean = sum/(float)n;
        for (i = 1 ; i<= n; i++)
        {
                deviation = value[i] - mean;
                sumsqr += deviation * deviation;
        }
        variance = sumsqr/(float)n ;
        stddeviation = sqrt(variance) ;
        printf("\nNumber of items : %d\n",n);
        printf("Mean : %f\n", mean);
        printf("Standard deviation : %f\n", stddeviation);
  }
```

53. C program to count the number of digits of a number.

```
#include <stdio.h>
#include<conio.h>
void digit(int);
void main()
{
        int n;
        clrscr();
        printf("Enter an integer: ");
        scanf("%d", &n);
        digit(n);
```

```
        getch();
}
void digit(int n)
{
        int count=0;
        while(n!=0)
        {
                n/=10;
                ++count;
        }
        printf("Number of digits: %d",count);
}
```

54. Write a program that reads a floating-point number and then displays right-most digit of the integral part of the number.

```
#include<stdio.h>
#include<conio.h>
int rmd(float);
void main()
{
        int a,e;
        float p;
        clrscr();
        printf("Enter the value of p\n");
        scanf("%f",&p);
        printf("%d\n",rmd(p));
        getch();
}
int rmd(float p)
{
        int a;
        a=(int)p;
        if(a>10)
                return a%10;
        else
                return a;
}
```

55. Modify the above program to display to right-most digits of the integral part of the number.

```
#include<stdio.h>
#include<conio.h>
int rm2d(float);
void main()
{
        int a,e;
```

```
        float p;
        clrscr();
        printf("Enter the value of p\n");
        scanf("%f",&p);
        printf("%d\n",rm2d(p));
        getch();
}
int rm2d(float p)
{
        int a;
        a=(int)p;
        if(a>100)
                return a%100;
        else
                return a;
}
```

56. Given an integer number, write a program that displays the number as follows:

First line: all digits

Second line: all except first digit

Third line: all except first two digits

```
#include<stdio.h>
#include<conio.h>
void digit(float);
void main()
{
        float num;
        clrscr();
        printf("Enter the value of p\n");
        scanf("%f",&num);
        digit(num);
        getch();
}
void digit(float p)
{
        int a,b,c,e,x;
        printf("%f\n",p);
        a=(int)p;
        e=a%10000;
        b=e%1000;
        c=b%100;
        x=c%10;
        if(a>10000)
                printf("%d\n%d\n%d\n%d\n%d\n ",a,e,b,c,x);
```

```
        else if(a>1000)
                printf("%d\n%d\n%d\n%d\n ",a,b,c,x);
        else if(a>100)
                printf("%d\n%d\n%d\n",a,c,x);
        else if(a>10)
                printf("%d\n%d\n",a,x);
}
```

57. Write the program that will read a real number from the keyboard and print the following output in one line:
Smallest integer not less than the number
The given number
Largest integer not greater than the number

```
#include<stdio.h>
#include<conio.h>
void digit(float);
void main()
{
        float m;
        clrscr();
        printf("Enter the value of m\n");
        scanf("%f",&m);
        digit(m);
        getch();
}
void digit(float m)
{
        int n,p;
        n=(m/1)+1;
        p=m;
        printf("%d %f %d",n,m,p);
}
```

58. The total distance travelled by a vehicle in t seconds is given by
Distance= ut+(at2)/2
Where u is the initial velocity (meter per second),a is the acceleration (meter per second2). Write a program to evaluate the distance travelled at intervals of time, give the value of u and a. the program should provide the flexibility to the user to select his own time intervals and repeat the calculation for different value of u and a.

```
#include<stdio.h>
#include<conio.h>
void dstnce();
void main()
{
        clrscr();
```

```
        dstnce();
        getch();
}
void dstnce()
{
        int a,u,t,i,ch;
        float distance;
        for(i=1;i<10000;)
        {
                printf("Enter the value of a,u,t\n");
                scanf("%d %d %d",&a,&u,&t);
                distance=u*t+(a*t*t)/2;
                printf("%f",distance);
                printf("\nIf u want to continue press 1 else 0\n");
                scanf("%d",&ch);
                if(ch==1)
                        i++;
                else
                        break;
        }
}
```

59. For a certain electrical circuit with an inductance L and resistance R, the damped natural frequency is given by

Frequency =sqrt { (1/L*C) – (R*R/4*C*C) }

It is desired to study the variation of this frequency with C(capacitance).Write a program to calculate the frequency for different values of C starting from 0.01 to 0.1 in steps of 0.01.

```
#include<stdio.h>
#include<conio.h>
#include<math.h>
void equtn(float,float);
void main()
{
        float L,R;
        clrscr();
        printf("Enter the value of L,R\n");
        scanf("%f %f",&L,&R);
        equtn(L,R);
        getch();
}
void equtn(float L,float R)
{
        float C,x,a,b,F;
```

```
        for(C=0.01;C<=0.1;C=C+0.01)
        {
                a=( (1/L*C) - (R*R/4*C*C) );
                F=sqrt(a);
                printf("\nFor c=%f, the frequency=%f",C,F);
        }
}
```

60. Write a program to read two integer values m and n and to decide and print whether m is multiple of n.

```
#include<stdio.h>
#include<conio.h>
void multpl();
void main()
{
        clrscr();
        multpl();
        getch();
}
void multpl()
{
        int m,n;
        printf("Enter m & n Such that, m>=n:");
        scanf("%d %d",&m,&n);
        if(m%n==0)
                printf("m is a multiple of n");
        else
                printf("m is not a multiple of n");
}
```

61. The cost of one type of mobile service is Rs.250 plus Rs.1.25 for each call made over and above 100 calls. Write a program to read customer codes and calls made and print the bill for each customer.

```
#include<stdio.h>
#include<conio.h>
#define ms 250
float cost(int);
int main()
{
        int custcode,x,n=0;
        char ch;
        while(n<=100)
        {
                printf("\nEnter Customer code and calls made by him \n");
                scanf("%d %d",&custcode,&x);
                n++;
                printf("%d %0.2f",custcode,cost(x));
```

```
        }
        getch();
}
float cost(int call)
{
        return ms+1.25*(float)call;
}
```

62. Write a program to print a table of sin and cos functions for the interval 0 180 degrees in increments of 15 as shown below.

————————————————————————————————

x(degees)	**sin(x)**	**cos(x)**
0	**…….**	**…….**
15	**…….**	**…….**
…..	**…….**	**……**

```
#include<stdio.h>
#include<conio.h>
#include<math.h>
#define p1 3.1416
#define MAX 180
void sin_cos();
int main()
{
        sin_cos();
         getch();
}
void sin_cos()
{
        int i;
        float x,y,z;
        i=0;
        printf("x(degree)   sin(x)        cos(x)\n");
        while(i<=MAX)
        {
                x=(p1/MAX)*i;
                y=sin(x);
                z=cos(x);
                printf("%3d\t  %10.6f\t  %10.6f\t",i,y,z);
                printf("\n");
                i=i+15;
        }
}
```

63. Write a program to compute the values of square-roots and squares of the number 0 to 100 in steps 10 print the output in a tabular form as shown below.

————————————————————————————————

number	Square-root	square
0	0	0
100	10	10000

```
#include<stdio.h>
#include<conio.h>
#include<math.h>
void sqrtlist(int);
int main()
{
        int n;
        printf("Enter max number: ");
        scanf("%d",&n);
        sqrtlist(n);
        getch();
}
void sqrtlist(int n)
{
        int i,y;
        float x;
        printf("Number\t\tSquare root\t\tSquare\n");
        printf("-----------------------------------------------\n");
        for(i=0;i<=n;i++)
        {
                x=sqrt(i);
                y=i*i;
                printf("%3d\t\t%10.6f\t%10d\n",i,x,y);
        }
   }
```

64. Write a program to evaluate the following investment equation

$$\mathbf{V = P\,(1 + r)^{n}}$$

And print the tables which would give the values of various combination of the following values of P, r and n.

P: 1000, 2000, 3000, ……..10000

r: 0.10, 0.11, 0,12,……..0.20

n: 1,2,3……..10

```
#include<stdio.h>
 #include<math.h>
 #include<conio.h>
 void intrate()
 {
        int i,n,p,j;
        double v,r,t;
        printf("\n\n\n");
```

```
        r=0.10;
        n=10;
        p=1000;
        t=pow((1+r),i);
        printf("\nP       R          N          V\n");
        for(i=1;i<=n;i++)
        {
                if(r<=0.20 && p<=10000)
                {
                        t=pow((1+r),i);
                        v=p*t;
                        p=p+1000;
                        r=r+0.01;
                }
                printf("%d    %lf     %d   ",p,r,n);
                printf("V=%                  .6lf ",v);
                printf("\n");

        }
}
void main()
{
        clrscr();
        intrate();
        getch();
}
```

65. Write a program to compute the value of Euler's number that is used as the base of natural logarithms. Use the following formula.

e= 1+ 1/1! +1 /2! + 1/3!+……. 1/n!

```
#include<stdio.h>
#include<conio.h>
float fact(float i)
{
        float f=1;
        int k;
        for(k=1;k<=i;k++)
                f*=k;
        return(f);
}
float euler(int);
void main()
{
```

```
        int n;
        printf("Enter nth term: ");
        scanf("%d",&n);
        printf("%f",euler(n));
        getch();

}
float euler(int n)
{
        float e=1;
        int i;
        for(i=1;i<n;i++)
        {
                e=e+(1/fact(i));
         }
        return e;
}
```

66. Write programs to evaluate the following functions to 0.0001% accuracy.

$$\sin x = x - \frac{x^3}{3!} + \frac{x^5}{5!} + \frac{x^7}{7!} + \cdots$$

```
#include <stdio.h>
#include <conio.h>
#include <math.h>
void main()
{
        int n, x1, i, j;
        float x, sign, sinx, fact;
        clrscr();
        printf("Enter the number of the terms in a series\n");
        scanf("%d", &n);
        printf("Enter the value of x(in degrees)\n");
        scanf("%f", &x);
        x1 = x;
        x = x * (3.142 / 180.0); /*  Degrees to radians */
        sinx = 1;
        sign = -1;
        for (i = 3; i <= n; i = i + 2)
        {
                fact = 1;
                 for (j = 1; j <= i; j++)
                {
                        fact = fact * j;
                }
```

```
            sinx = sinx + (pow(x, i) / fact) * sign;
            sign = sign * (-1);
        }
        printf("Sum of the cosine series = %7.2f\n", sinx);
        getch();
}
```

67. Write programs to evaluate the following functions to 0.0001% accuracy.

$$\cos x = x - \frac{x^2}{2!} + \frac{x^4}{4!} + \frac{x^6}{6!} + \cdots$$

```
#include <stdio.h>
#include <conio.h>
#include <math.h>
void main()
{
        int n, x1, i, j;
        float x, sign, cosx, fact;
        clrscr();
        printf("Enter the number of the terms in a series\n");
        scanf("%d", &n);
        printf("Enter the value of x(in degrees)\n");
        scanf("%f", &x);
        x1 = x;
        x = x * (3.142 / 180.0);   /*  Degrees to radians */
        cosx = 1;
        sign = -1;
        for (i = 2; i <= n; i = i + 2)
        {
                fact = 1;
                for (j = 1; j <= i; j++)
                {
                        fact = fact * j;
                }
                cosx = cosx + (pow(x, i) / fact) * sign;
                sign = sign * (-1);
        }
        printf("Sum of the cosine series = %7.2f\n", cosx);
        getch();
}
```

68. Write programs to evaluate the following functions to 0.0001% accuracy.

$$SUM = 1 + (1/2)^2 + (1/3)^3 + (1/4)^4 + \cdots$$

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

```
#include<math.h>
double fun();
void main()
{
        clrscr();
        printf("the sum= %lf",fun());
        getch();
}
double fun()
{
        double term=1.0,sum=1.0;
        int deno=2;
        while(term>=0.0001)
        {
                term=1.0/pow(deno,deno);
                sum+=term;
                deno++;
        }
        return sum;
}
```

69. Write a program to print all the ASII values and their equivalent character using while loop. The ASCII values vary from 0 to 255

```
#include<stdio.h>
#include<conio.h>
void f()
{
         int a=0;
        while(a<255)
        {
                printf("%d=%c",a,a);
                printf("\n");
                a++;
        }
}
void main()
{
        f();
         getch();
}
```

70. Write a program for a matchstick game being played between the computer and a user. Your program should ensure that the computer always wins. Rules for the game are as follows: There are 21 matchsticks. The Computer asks the player to pick 1, 2, 3, or 4 matchsticks. After the person picks, the computer does its picking. Whoever is forced to pick up the last matchstick loses the game.

```
#include<stdio.h>
#include<conio.h>
void matchstick()
{
        int x,y,n=21;
         printf("\t\t***The total amount of matchsticks is 21.***\n");
        while(n>1)
        {
                printf("\nENTER YOUR CHOICE:   ");
                 scanf("%d",&x);
                if (1<=x && x<=4)
                 {
                        n=n-x;
                         printf("\n\nUSER CHOOSE %d\n\t\t***THE MATCHSTICKS LEFT %d.***\n",x,n);
                }
                else
                {
                        printf("\n\n\t\tWRONG ENTRY!!!");
                        break;
                }
                y=5-x;
                n=n-y;
                printf("\nCOMPUTER CHOOSE %d\n\t\t***THE MATCHSTICKS LEFT %d.***\n",y,n);

         }
         printf("\n\n\t\t\t***COMPUTER WINS***");
}
void main()
{
        clrscr();
        matchstick();
        getch();
}
```

71. Write a program to fill the entire screen with a smiling face.

```
#include<stdio.h>
#include<conio.h>
void smiley()
{
        int i=1,j;
        for(j=1;j<=1920;j++)
        printf("%c",i);
}
void main()
```

```
{
        clrscr();
        smiley();
        getch();
}
```

72. Write a program to fill the entire screen with diamond and heart alternatively. ASCII for heart is 3 and for diamond is 4.

```
#include<stdio.h>
#include<conio.h>
void heartdiam()
{
        int r,c;
        for(r=1;r<=24;r++)
                for(c=1;c<=80;c++)
                        printf("%c%c",4,3);
}
void main()
{
        clrscr();
        heartdiam();
        getch();
}
```

73. Write a program to find the value of C_r^n and P_r^n

```
#include<stdio.h>
#include<conio.h>
long int fact(int p)
{
        long int f=1;
        int i;
        for(i=1;i<=p;i++)
                f*=i;
        return f;
}
void main()
{
        int n,r;
        clrscr();
        float comb,perm;
        printf("\nenter the value of n  : ");
        scanf("%d",&n);
        printf("\nenter the value of p  : ");
        scanf("%d",&r);
        comb=fact(n)/(fact(r)*fact(n-r));
```

```
        perm=fact(n)/fact(n-r);
        printf("\npermutation result = %f",perm);
        printf("\ncombination result = %f",comb);
        getch();
}
```

74. Write a program to generate all combination of 1, 2, or 3 using loop.

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

75. Write a program to generate a random number between a given ranges.

```
#include<stdio.h>
#include<stdlib.h>
int myrandom(int p, int q)
{
        int r;
        srand(time(NULL));
        r=(rand() % (q-p)) + p;
        return(r);
}
void main()
{
        int a,b,rnd;
        clrscr();
        printf("\nEnter the range  : ");
        scanf("%d%d",&a,&b);
        rnd=myrandom(a,b);
        printf("%d",rnd);
        getch();
}
```

76. This C Program performs ATM transaction with 50000 balances in hand. The types of ATM transaction are

1) Balance checking
2) Cash withdrawal (e.g 500 = 5 x 100; 900 = 1 x 500 + 4 x 100; 1000 = 2 x 500; 1700 = 1 x 1000 + 1 x 500 + 2 x 200; 5000 = 4 x 1000 + 2 x 500
3) Cash deposition.
You can opt any of the above transaction according to your need of transaction.

```
#include<stdio.h>
#include<conio.h>
int balance=50000, deposit, withdraw,choice, pin, k;
char transaction ='y';
void denomination(int w)
{
        int flag=0,a=0,b=0,c=0,d=0,e=0;
        printf("\n\n THE DENOMINATIONS ARE  : ");
        if(w==500)
                e=5;
        else if(w==1000)
                c=2;
        else
        {
                if(w>2000)
                {
                        w=w-1000;
                        flag=1;
                }
                a=w / 1000;
                b=w % 1000;
                c=b / 500;
                if (flag==1)
                        c+=2;
                d=b % 500;
                e=d/100;
}
if (a!=0)
        printf("\n%d x 1000",a);
if(c!=0)
        printf("\n%d x  500",c);
if(e!=0)
        printf("\n%d x 100",e);
}

void atm()
{
                do
```

```
{
        printf("********Welcome to our ATM Service**********\n");
        printf("1. Check Balance\n");
        printf("2. Withdraw Cash\n");
        printf("3. Deposit Cash\n");
        printf("4. Quit\n");
        printf("******************?**************************?*\n\n");
        printf("Enter your choice  : ");
        scanf("%d", &choice);
        switch (choice)
        {
        case 1:
                printf("\n YOUR BALANCE IN Rs : %d ", balance);
                break;
        case 2:
                printf("\n ENTER THE balance TO WITHDRAW  : ");
                scanf("%d", &withdraw);
                if (withdraw % 100 != 0)
                {
                        printf("\n PLEASE ENTER THE AMOUNT IN MULTIPLES OF 100");
                }
                else if (withdraw >(balance - 500))
                {
                        printf("\n INSUFFICENT BALANCE");
                }
                else
                {
                        balance = balance - withdraw;
                        printf("\n\n PLEASE COLLECT CASH");
                        denomination(withdraw);
                        printf("\n\n YOUR CURRENT BALANCE IS %d", balance);
                }
                break;
        case 3:
                printf("\n ENTER THE AMOUNT TO DEPOSIT  : ");
                scanf("%d", &deposit);
      balance = balance + deposit;
                printf("YOUR BALANCE IS %d", balance);
                break;
        case 4:
                printf("\n THANK YOU FOR USING OUR ATM SERVICES");
                break;
        default:
```

```
                        printf("\n INVALID CHOICE");
                }
                printf("\n\n\n DO U WISH TO HAVE ANOTHER TRANSCATION?(y/n)  : \n");
                fflush(stdin);
                scanf("%c", &transaction);
                if (transaction == 'n'|| transaction == 'N')
            k = 1;
        } while (!k);
}
int main()
{
        while (pin != 1920)
        {
                printf("ENTER YOUR SECRET PIN NUMBER  : ");
                scanf("%d", &pin);
                if (pin != 1520)
                printf("PLEASE ENTER VALID PIN\n");
        }
        atm();
        printf("\n\n THANK YOU FOR USING OUR ATM SERVICES");
        getch();
}
```

77. C program to find floor and ceiling of a given number.

```
#include<stdio.h>
#include<conio.h>
#include<math.h>
void floorceil(float p)
{
        int f,c;
        f=floor(p);
        c=ceil(p);
        printf("\nfloor = %d",f);
        printf("\nceiling = %d",c);
}
void main()
{
        float n;
        clrscr();
        printf("\enter the number  : ");
        scanf("%f",&n);
        floorceil(n);
        getch();
}
```

78. C program to round off a given number.

```
#include<stdio.h>
#include<conio.h>
#include<math.h>
int roundoff(float p)
{
        int f,c;
        float d1,d2;
        f=floor(p);
        c=ceil(p);
        d1=p-f;
        d2=c-p;
        if (d1 > d2)
                return c;
        else
                return f;
}
void main()
{
        float n;
        int rnd;
        clrscr();
        printf("\enter the number  : ");
        scanf("%f",&n);
        rnd=roundoff(n);
        printf("\nrounded off number is %d",rnd);
        getch();
}
```

79. C program to implement: if A and B are two integer number C = AB e.g A = 231; B = 764 ➔ C = 231764

```
#include<stdio.h>
#include<conio.h>
#include<math.h>
int countdig(int p)
{
        int count=0;
        while(p>0)
        {
                count++;
                p/=10;
        }
        return count;
}
void main()
```

```
{
        int a,b,c,p;
        long int res;
        clrscr();
        printf("\enter the two numbers  : ");
        scanf("%d%d",&a,&b);
        c=countdig(b);
        p=pow(10,c);
        res = (a*p) + b;
        printf("result = %ld",res);
        getch();
}
```

80. C program to find median of a set of numbers.

```
#include<stdio.h>
#include<conio.h>
float median(float a[],int n)
{
        int med;
        if ( n % 2 == 0)
                med = (a[n/2] + a[n/2+1])/2.0 ;
        else
                med = a[n/2 + 1];
        return med;
}
void main( )
{
        int i,j,n;
        float m,a[50],t;
        printf("Enter the number of items\n");
        scanf("%d", &n);
        printf("Input %d values \n",n);
        for (i = 1; i <= n ; i++)
                scanf("%f", &a[i]);
        for (i = 1 ; i <= n-1 ; i++)                    // sorting
        {
                for (j = 1 ; j <= n-i ; j++)
                {
                        if (a[j] <= a[j+1])
                        {
                                t = a[j];
                                a[j] = a[j+1];
                                a[j+1] = t;
                        }
```

```
                else continue ;
            }
        }
        for (i = 1 ; i <= n ; i++)
        printf("%f  ", a[i]);
        m=median(a,n);
        printf("\n\nMedian is %f\n",m);
        getch();
}
```

81. Write C program for all patterns given bellow using function.

```
1
21
321
4321
54321
```

```
54321
5432
543
54
5
```

```
1
22
333
4444
55555
```

```
5
44
333
2222
11111
```

```
1
23
456
78910
```

```
    1
  2 3 4
5 6 7 8 9
```

```
12344321
123**321
12****21
1******1
```

```
5432*
543*1
54*21
5*321
*4321
```

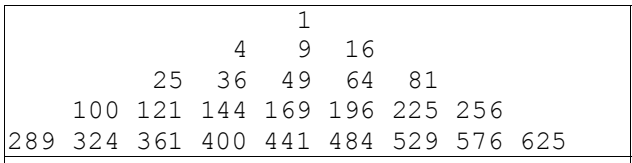
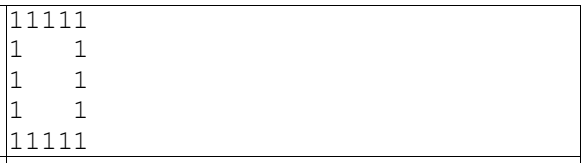
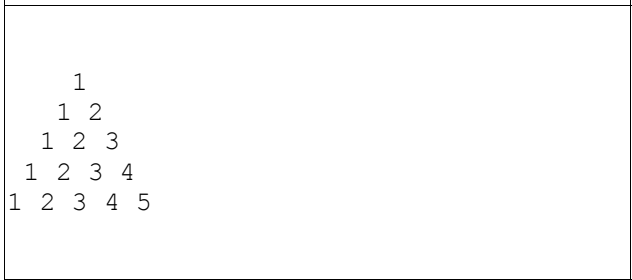
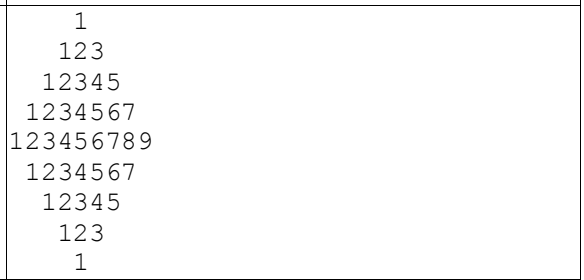
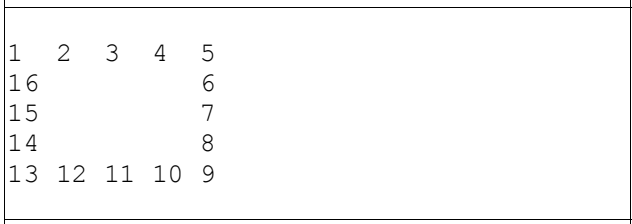
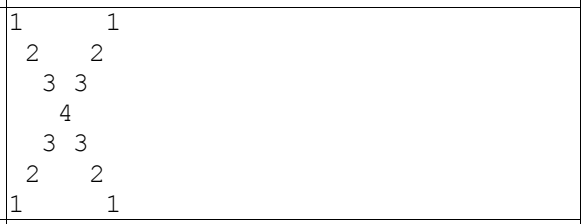
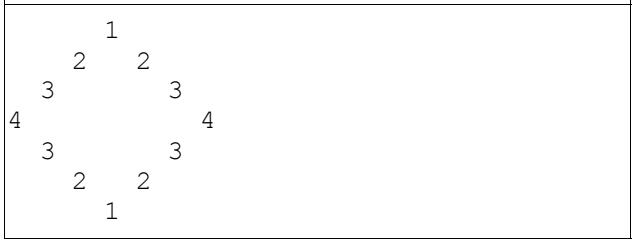
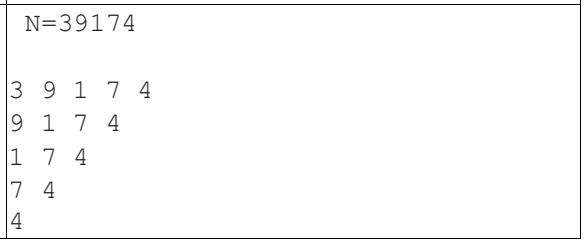
```
1   2   3   4   5   6   7   8   9   10
36  37  38  39  40  41  42  43  44  11
35  64  65  66  67  68  69  70  45  12
34  63  84  85  86  87  88  71  46  13
33  62  83  96  97  98  89  72  47  14
32  61  82  95  100 99  90  73  48  15
31  60  81  94  93  92  91  74  49  16
30  59  80  79  78  77  76  75  50  17
29  58  57  56  55  54  53  52  51  18
28  27  26  25  24  23  22  21  20  19
```

```
1         1
12       21
123     321
1234   4321
1234554321
```

```
    1
   21
  321
 4321
54321
```

```
11
12 13
13 14 15
14 15 16 17
```

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

a)

```
#include <stdio.h>
#include<conio.h>
void pattern_a(int);
int main()
{
        int n;
        printf("Enter line no: ");
        scanf("%d",&n);
        pattern_a(n);
        getch();
        return 0;
}
void pattern_a(int n)
{
        int i, j;
        for(i=1;i<=n;i++)
        {
                for(j=i;j>=1;j--)
                {
                        printf("%d",j);
```

```
                }
                printf("\n");
        }
}
```

b)

```
#include <stdio.h>
#include<conio.h>
void pattern_b(int);
int main()
{
        int n;
        printf("Enter line no: ");
        scanf("%d",&n);
        pattern_b(n);
        getch();
        return 0;
}
void pattern_b(int n)
{
        int i, j;
        for(i=1;i<=n;i++)
        {
                for(j=5;j>=i;j--)
                {
                        printf("%d",j);
                }
                printf("\n");
         }
}
```

c)

```
#include <stdio.h>
#include<conio.h>
void pattern_c(int);
int main()
{
        int n;
        printf("Enter line no: ");
        scanf("%d",&n);
        pattern_c(n);
        getch();
        return 0;
}
```

```
void pattern_c(int n)
{
	int i, j;
	for(i=1;i<=n;i++)
	{
		for(j=1;j<=i;j++)
		{
			printf("%d",i);
		}
		printf("\n");
	}
}
```

d)

```
#include <stdio.h>
#include<conio.h>
void pattern_d(int);
int main()
{
	int n;
	printf("Enter line no: ");
	scanf("%d",&n);
	pattern_d(n);
	getch();
	return 0;
}
void pattern_d(int n)
{
	 int i,j;
	for(i=n;i>=1;i--)
	{
		for(j=n;j>=i;j--)
		{
			printf("%d",i);
		}
		printf("\n");
	}

}
```

e)

```
#include <stdio.h>
#include<conio.h>
void pattern_e(int);
int main()
```

```
{
        int n;
        printf("Enter line no: ");
        scanf("%d",&n);
        pattern_e(n);
         getch();
        return 0;
}
void pattern_e(int n)
{
        int i,j,k;
        k=1;
        for(i=1;i<n;i++)
        {
                for(j=1;j<=i;j++)
                {
                        printf("%d",k++);
                }
                printf("\n");
        }

}
```

f)

```
#include<stdio.h>
#include<conio.h>
void pattern_f(int);
void main()
{
        int n;
        clrscr();
        printf("Enter number of lines:");
        scanf("%d",&n);
        pattern_f(n);
        getch();
}
void pattern_f(int n)
{
         int i,j,k=1;
         for(i=1;i<=(2*n-1);i=i+2)
        {
                for(j=(2*n-1);j>=1;j--)
                {
                        if(j>i)
```

```
                                        printf("  ");
                                else
                                        printf("%3d ",k++);
                        }
                        printf("\n");
                }
}
```

g)

```
#include <stdio.h>
#include<conio.h>
void pattern_g(int);
int main()
{
        int n;
        printf("Enter line no: ");
        scanf("%d",&n);
        pattern_g(n);
        getch();
        return 0;
}
void pattern_g(int n)
{
        int i,j,k;
        for(i=n;i>=1;i--)
        {
                for(j=1;j<=n;j++)
                {
                        if(j<=i)
                                printf("%d",j);
                        else
                                printf(" ");
                }
                for(j=n;j>=1;j--)
                {
                        if(j<=i)
                                printf("%d",j);
                        else
                                printf(" ");
                }
                printf("\n");
        }
}
```

h)

```
#include <stdio.h>
#include<conio.h>
void pattern_h(int);
int main()
{
	int n;
	printf("Enter line no: ");
	scanf("%d",&n);
	pattern_h(n);
	getch();
	return 0;
}
void pattern_h(int n)
{
	int i,j;
	for(i=1;i<=n;i++)
	{
		for(j=n;j>=1;j--)
		{
			if(i==j)
				printf("*");
			else
				printf("%d",j);
		}
		printf("\n");
	}
}
```

i)

```
#include<stdio.h>
#include<stdlib.h>
void pattern_i();
void main()
{
	pattern_i();
	getch();
}
void pattern_i()
{
	 int a[10][10]={0},i,j,low=0,top=9,n=1;
	for(i=0;i<5;i++,low++,top--)
	 {
		for(j=low;j<=top;j++,n++)
			a[i][j]=n;
```

```
                for(j=low+1;j<=top;j++,n++)
                        a[j][top]=n;
                for(j=top-1;j>=low;j--,n++)
                        a[top][j]=n;
                for(j=top-1;j>low;j--,n++)
                        a[j][low]=n;
        }
        printf("\t\t\t\tPerfect Square\n");
        for(i=0;i<10;i++)
        {
                printf("\n\n\t");
                for(j=0;j<10;j++)
                {
                        printf("%6d",a[i][j]);
                }
        }
}
```

j)

```
#include <stdio.h>
#include<conio.h>
void pattern_j(int);
int main()
{
        int n;
        printf("Enter line no: ");
        scanf("%d",&n);
        pattern_j(n);
        getch();
        return 0;
}
void pattern_j(int n)
{
        int i,j,k;
        for(i=1;i<=n;i++)
        {
                for(j=1;j<=n;j++)
                {
                        if(j<=i)
                                printf("%d",j);
                        else
                                printf(" ");
                }
```

```
                for(j=n;j>=1;j--)
                {
                        if(j<=i)
                                printf("%d",j);
                        else
                                printf(" ");
                }
                printf("\n");
        }
}
```

k)

```
#include <stdio.h>
#include<conio.h>
void pattern_k(int);
int main()
{
         int n;
        printf("Enter line no less than 10: ");
        scanf("%d",&n);
        pattern_k(n);
        getch();
        return 0;
}
void pattern_k(int n)
{
        int i,j,k;
        for(i=1;i<=n;i++)
        {
                for(j=n;j>=1;j--)
                {
                        if(j<=i)
                                printf("%d",j);
                        else
                                printf(" ");
                }
                printf("\n");
        }
}
```

l)

```
#include <stdio.h>
#include <conio.h>
void pattern_l(int);
int main()
```

```
{
        int n;
        printf("Enter line no: ");
        scanf("%d",&n);
        pattern_l(n);
        getch();
        return 0;
}
void pattern_l(int n)
{
        int i,j;
        for(i=1;i<=n;i++)
        {
                for(j=1;j<=i;j++)
                {
                        printf("%d ", 9+i+j);
                }
                printf("\n");
        }
}
```

m)

```
#include<stdio.h>
#include<conio.h>
void pattern_m(int);
void main()
{
        int n;
        clrscr();
        printf("Enter the number of lines:");
        scanf("%d",&n);
        pattern_m(n);
        getch();
}
void pattern_m(int n)
{
        int i,j,k;
        k=1;
        for(i=1;i<=n;i++)
        {
                for(j=n;j>=1;j--)
                {
                        if(j > i)
                                printf("   ");
```

```
                        else
                                printf("%3d",k++);
                }
                printf("\n");
        }
}
```

n)

```
#include <stdio.h>
#include <conio.h>
void pattern_n(int);
int main()
{
        int n;
        printf("Enter line no: ");
        scanf("%d",&n);
        pattern_n(n);
        getch();
        return 0;
}
void pattern_n(int n)
{
        int i, j, k=1;
        for(i=1;i<=5;i++)
        {
                for(j=1;j<(i*2);j++)
                {
                        printf("%d ",k*k);
                        k++;
                }
                printf("\n");
        }
}
```

o)

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

```
        getch();
}
void pattern_o(int n)
{
        int i,j;
        for(i=1;i<=n;i++)
        {
                for(j=1;j<=n;j++)
                {
                        if(j==n || j==1 || i==1 || i==n)
                                printf("1");
                        else
                                printf(" ");
                }
                printf("\n");
        }
}
```

p)

```
#include <stdio.h>
#include <conio.h>
void pattern_p(int);
int main()
{
        int n;
        clrscr();
        printf("Enter line no: ");
        scanf("%d",&n);
        pattern_p(n);
        getch();
        return 0;
}
void pattern_p(int n)
{
        int i,j;
        for(i=1;i<=n;i++)
        {
                for(j=n;j>i;j--)
                {
                        printf(" ");
                }
                for(j=1;j<=i;j++)
                {
                        printf("%d ",j);
```

```
                }
                printf("\n");
        }
}
```

q)

```
#include<stdio.h>
#include<conio.h>
void pattern_q(int);
void main()
{
        int n;
        clrscr();
        printf("Enter the number of lines less than 10:");
        scanf("%d",&n);
        pattern_q(n);
        getch();
        return 0;
}
void pattern_q(int n)
{
        int i, j, k;
        for(i=1;i<=(n/2+1);i++)
        {
                for(j=i;j<(n/2+1);j++)
                {
                        printf(" ");
                 }
                for(k=1;k<(i*2);k++)
                {
                        printf("%d",k);
                 }
                printf("\n");
         }
        for(i=n/2;i>=1;i--)
         {
                for(j=(n/2+1);j>i;j--)
                {
                        printf(" ");
                 }
                for(k=1;k<(i*2);k++)
                {
                        printf("%d",k);
                 }
```

```
                printf("\n");
        }
 }
```
r)
```
#include<stdio.h>
#include<stdio.h>
void pattern_r();
void main()
{
        pattern_r();
        getch();
}
void pattern_r()
{
        int i,j,k=6,l=13,m=16;
        for(i=1;i<=5;i++)
         {
                for(j=1;j<=5;j++)
                {
                        if(i==1)
                                printf("%-3d",j);
                        else if(j==5)
                                printf("%-3d",k++);
                        else if(i==5)
                                printf("%-3d",l--);
                        else if(j==1)
                                printf("%-3d",m--);
                        else
                                printf("   ");
                  }
                printf("\n");
        }
}
```
s)
```
#include<stdio.h>
#include<conio.h>
void pattern_s(int);
void main()
{
        int n;
        printf("Enter a positive number: ");
        scanf("%d",&n);
        pattern_s(n);
```

```
	getch();
}
void pattern_s(int l)
{
	int i,j,k=1,n;
	n=l*2-1;
	 int m[100][100]={0};
	for(i=1;i<=n;i++)
	{
		for(j=1;j<=n;j++)
			 if(j==i || (l*2)-i==j)
				m[i][j]=k;
			if(i<l)
				k++;
			else
				--k;
	}
	for(i=1;i<=n;i++)
	{
		for(j=1;j<=n;j++)
		{
			if(m[i][j]==0)
				printf(" ");
			else
				printf("%d",m[i][j]);
		}
		printf("\n");
	}
}
```

t)

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

```
void pattern_t(int l)
{
	int i,j,k=1,n;
	n=l*2-1;
	 int m[100][100]={0};
	for(i=1;i<=n;i++)
	{
		 if(i<=l)
		{
			for(j=1;j<=n;j++)
				if((i+j)==(n/2)+2 || j-i==(n/2))
					m[i][j]=k;
				k++;
		 }
		else
		{
			for(j=1;j<=n;j++)
				if((i-j)==(n/2) || i+j==l*3-1)
					m[i][j]=k;
				--k;
		}

	}
	for(i=1;i<=n;i++)
	{
		for(j=1;j<=n;j++)
		{
			if(m[i][j]==0)
				printf(" ");
			else
				printf("%d",m[i][j]);
		}
		printf("\n");
	}
}
```

u)

```
#include <stdio.h>
void pattern_u(int);
void main()
{
	long int n;
	clrscr();
	printf ("enter a number:");
```

```
        scanf("%ld",&n);
        pattern_u(n);
        getch();
}
void pattern_u(int n)
{
         int i=1;
        for(i=10;i<n;i*=10);
        for (i=i/10; n>0; i/=10)
         {
                printf("%d\n", n);
                n%=i;
        }
 }
```