Program No.1 **AREA OF A RECTANGLE**

Aim : Write a C program to find the area of a rectangle.

Program:

```
#include<stdio.h>
#include<conio.h>
void main()
{
int area,l,b;
clrscr();
printf("Enter the length and breadth");
scanf("%d%d",&l,&b);
area=l*b;
printf("Area of the rectangle is %d",area);
getch();
}
```

Result: The program executed successfully and output verified.

Output

```
Enter the length and breadth
10  5
Area of the rectangle is 50
```

****

Program No.2 **SIMPLE INTEREST**

Aim : Write a C program to find the simple interest.

Program:

```
#include<stdio.h>
#include<conio.h>
void main()
{
float I,P,N,R:
clrscr();
printf("Enter the Principal Amount, No.of years, Rate");
scanf("%f%f%f",&P,&N,&R);
I=P*N*R/100;
printf("Simple interest = %f",I):
getch();
}
```

Result: The program executed successfully and output verified.

Output

```
Enter the Principal Amount, No.of years, Rate
1000  5  10
Simple interest = 500.000000
```

****

Program No.3 **ODD OR EVEN**

Aim : Write a C program to check whether the entered number is odd or even using if…else statement.

Program:

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

Result: The program executed successfully and output verified.

Output

```
Enter a number
10
10 is even
Enter a number
55
55 is odd
```

****

Program No.4 **SMALLEST AMONG TWO NUMBERS**

Aim : Write a C program to find the smallest among two numbers using if…else statement.

Program:

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

Result: The program executed successfully and output verified.

Output

Enter two numbers
10 5
5 is small
Enter two numbers
1 50
1 is small

****

Program No.5 **LARGEST AMONG THREE NUMBERS**

Aim : Write a C program to find the largest among three numbers using nested if statement.

Pogram:

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

Result: The program executed successfully and output verified.

Output

Enter three numbers
10 5 33
33 is large
Enter three numbers

101 5 33
101 is large
Enter three numbers
10 50 33
50 is large
****

Program No.6 **POSITIVE ,NEGATIVE OR ZERO**

Aim : Write a C program to check whether the entered number is positive or negative or zero using else if ladder statement.

Program:

```
#include<stdio.h>
#include<conio.h>
void main()
{
int a;
clrscr();
printf("Enter the number");
scanf("%d",&a);
if(a>0)
printf("%d is positive",a);
else if(a<0)
printf("%d is negative",a);
else
printf("Zero");
getch();
}
```

Result: The program executed successfully and output verified.

Output

Enter the number
0
Zero
Enter the number
101
101 is positive
Enter the number
-10
-10 is negative

Program No.7 **QUADRATIC EQUATION**

Aim : Write a C program to find the solution of a quadratic equation.

Program:

```
#include<stdio.h>
#include<conio.h>
#include<math.h>
void main()
{
float a,b,c,r1,r2,r;
int d;
clrscr();
printf("Enter the coefficients");
scanf("%f%f%f",&a,&b,&c);
d=(b*b)-(4*a*c);
if(d>0)
{
r1=((-b)+sqrt(d))/(2*a);
r2=((-b)-sqrt(d))/(2*a);
printf("Roots are real and distinct");
printf("Root 1 is %f \n Root 2 is %f",r1,r2);
}
else if(d==0)
{
r=(-b)/(2*a);
printf("Roots are real and Equal");
printf("Root 1 is %f \n Root 2 is %f",r,r);
 }
else   {
printf("Roots are imaginary");
}
getch();
}
```

Result: The program executed successfully and output verified.

Output

```
Enter the coefficients
1 2 -8
Roots are real and distinct
Root 1 is 2.000000
Root 2 is - 4.000000
Enter the coefficients
1 2 1
Roots are real and Equal
Root 1 is -1.000000
Root 2 is -1.000000
```

Enter the coefficients
1 1 5
Roots are imaginary

****

Program No.8 CONDITIONAL OPERATOR

Aim : Write a C program to find the smallest among two numbers using conditional operator.

Program:

```
#include<stdio.h>
#include<conio.h>
void main()
{
int a,b,c;
clrscr();
printf("Enter two numbers");
scanf("%d%d",&a,&b);
c=(a<b)?a:b;
printf("Smallest number is %d",c);
getch();
}
```

Result: The program executed successfully and output verified.

Output

Enter two numbers
3 8
Smallest number is 3

****

Program No.9 CALCULATOR

Aim : Write a C program to implement a simple calculator using switch case.

Program:

```
#include<stdio.h>
#include<conio.h>
void main()
{
int a,b,c;
clrscr();
printf("Enter two numbers");
scanf("%d%d",&a,&b);
printf("Enter choice");
scanf("%d",&c);
switch(c)
{
case 1:printf("Sum=%d",a+b);
break;
case 2:printf("Difference=%d",a-b);
```

```
break;
case 3:printf("Product=%d",a*b);
break;
case 4:printf("Quotient=%d",a/b);
break;
case 5:printf("Remainder=%d",a%b);
break;
default:printf("Invalid choice");
}
getch();
}
```

Result: The program executed successfully and output verified.

Output

```
Enter the two numbers
3 8
Enter choice
1
Sum=11
Enter the two numbers
3 8
Enter choice
10
Invalid choice
```

****

Program No. 10 **FOR LOOP**

Aim : Write a C program to print first N natural numbers using for loop.

Program

```
#include<stdio.h>
#include<conio.h>
void main()
{
int i,n;
clrscr();
printf(" Enter the limit");
scanf("%d",&n);
for(i=1;i<=n;i++)
printf("\t %d",i);
getch();
}
```

Result: The program executed successfully and output verified.

Output

```
Enter the limit  10
1 2 3 4 5 6 7 8 9 10
```

****

Program No. 11 WHILE LOOP

Aim : Write a C program to print odd numbers upto N using while loop.

Program:

```
#include<stdio.h>
#include<conio.h>
void main()
{
int i=1,n;
clrscr();
printf(" Enter the limit");
scanf("%d",&n);
while(i<=n)
{
printf("\t%d",i);
i=i+2;
}
getch();
}
```

Result: The program executed successfully and output verified.

Output

```
Enter the limit  10
1  3  5  7  9
```

****

Program No. 12 DO… WHILE LOOP

Aim : Write a C program to print even numbers upto N using do..while loop.

Program:

```
#include<stdio.h>
#include<conio.h>
void main()
{
int n,i=2;
clrscr();
printf(" Enter the limit");
scanf("%d",&n);
do   {
printf(" \t %d",i);
i=i+2;
} while(i<=n);
 getch();   }
```

Result: The program executed successfully and output verified.

Output

```
Enter the limit  10
2  4  6  8  10
```

****

Program No. 13 MULTIPLICATION TABLE

Aim : Write a C program to print the multiplication table of any number.

Program:

```
#include<stdio.h>
#include<conio.h>
void main()
{
int n,i;
clrscr();
printf("Enter a number");
scanf("%d",&n);
for(i=1;i<=10;i++)
{
printf("%d x %d=%d",i,n,i*n);
printf("\n");
}
getch();
}
```

Result: The program executed successfully and output verified.

Output

```
Enter number 5
1 x 5=5
2 x 5=10
3 x 5=15
4 x 5=20
5 x 5=25
6 x 5=30
7 x5=35
8 x5=40
9 x5=45
10 x5=50
```

****

Program No. 14 SUM OF DIGITS OF A NUMBER

Aim : Write a C program to find the sum of digits of a number.

Program:

```
#include<stdio.h>
#include<conio.h>
void main()
{
int n,sum=0,rem;
clrscr();
printf("Enter a number");
scanf("%d",&n);
while(n!=0)
```

```
{
rem=n%10;
sum=sum+rem;
n=n/10;
}
printf("Sum of digits is%d",sum);
getch();
}
```

Result: The program executed successfully and output verified.

Output

```
Enter a number 1234
Sum of digits is 10
```

****

Program No. 15 REVERSE OF A NUMBER

Aim : Write a C program to find the reverse of a number.

Program:

```
#include<stdio.h>
#include<conio.h>
void main()
{
int n,rev=0,rem;
clrscr();
printf("Enter a number");
scanf("%d",&n);
while(n!=0)
{
rem=n%10;
rev=rev*10+rem;
n=n/10;
}
printf("Reversed number is %d",rev);
getch();      }
```

Result: The program executed successfully and output verified.

Output

```
Enter a number 1234
Reversed number is 4321
```

****

Program No. 16 PALINDROME NUMBER

Aim : Write a C program to check the given number is palindrome or not.

Program:

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

```
{
int n,rev=0,rem,temp;
clrscr();
printf("Enter a number");
scanf("%d",&n);
temp=n;
while(n!=0)
{
rem=n%10;
rev=rev*10+rem;
n=n/10;
}
if(temp==rev)
printf(" %d is palindrome",temp);
else
printf("Not palindrome");
getch();
}
```

Result: The program executed successfully and output verified.

Output

```
Enter a number 121
121 is palindrome
Enter a number 123
Not palindrome
```

****

Program No. 17 ARMSTRONG NUMBER

Aim : Write a C program to check the given number is Armstrong or not.

Program:

```
#include<stdio.h>
#include<conio.h>
void main()
{
int n,s=0,r,temp;
clrscr();
printf("Enter a number");
scanf("%d",&n);
temp=n;
while(n!=0)
{
r=n%10;
s=s+r*r*r;
n=n/10;
}
if(temp==s)
```

```
printf(" %d is Armstrong",temp);
else
printf("Not Armstrong");
getch();
}
```

Result: The program executed successfully and output verified.

Output

```
Enter a number 153
153 is Armstrong
Enter a number 123
Not Armstrong
```

****

Program No. 18 FACTORIAL

Aim : Write a C program to find the factorial of a number.

Program:

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

Result: The program executed successfully and output verified.

Output

```
Enter the number 3
The factorial is 6
```

****

Program No. 19 FIBONACCI SERIES

Aim : Write a C program to print the Fibonacci series.

Program:

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

```
scanf("%d",&n);
printf("%d\t %d",a,b);
for(i=3;i<=n;i++)
{
c=a+b;  printf("\t %d",c);
a=b;
b=c;
}
getch();
}
```

Result: The program executed successfully and output verified.

Output

```
Enter  the count 10
0 1 1 2 3 5 8 13 21 34
```

****

Program No. 20 PRIME OR NOT

Aim : Write a C program to check the given number is prime or not.

Program:

```
#include<stdio.h>
#include<conio.h>
void main()
{
int n,i,flag=0;
clrscr();
printf("Enter a number");
scanf("%d",&n);
for(i=2;i<=n/2;i++)
{   if(n%i==0)
   {
   flag=1;
   break;    } }
if(flag==0)
printf("%d is prime",n);
else
printf("%d is not prime",n);
getch();
}
```

Result: The program executed successfully and output verified.

Output

```
Enter a number 11
11 is prime
Enter a number 12
12 is not prime
```

Program No. 21 ARRAY SUM

Aim : Write a C program to find the sum of elements in an array

Program:

```
#include<stdio.h>
#include<conio.h>
void main()
{
int a[50],n,i,sum=0;
clrscr();
printf("Enter the no.of elements in the array");
scanf("%d",&n);
printf("Enter the array elements");
for(i=0;i<n;i++)
{
scanf("%d",&a[i]);
sum=sum+a[i];
}
printf("The array sum =%d",sum);
getch();
}
```

Result: The program executed successfully and output verified.

Output

```
Enter  the no.of elements in the array 5
Enter the array elements
10 20 30 40 50
The array sum=150
```

****

Program No. 22 REVERSE OF ARRAY

Aim : Write a C program to print the array elements in reverse order.

Program:

```
#include<stdio.h>
#include<conio.h>
void main()
{
int a[50],n,i;
clrscr();
printf("Enter the no.of elements in the array");
scanf("%d",&n);
printf("Enter the array elements");
for(i=0;i<n;i++)
scanf("%d",&a[i]);
printf("The array elements in reverse order are:");
for(i=n-1;i>=0;i--)
```

```
printf("  %d",a[i]);
getch();
}
```

Result: The program executed successfully and output verified.

Output

```
Enter  the no.of elements in the array 5
Enter the array elements
10 20 30 40 50
The array elements in reverse order are: 50 40 30 20 10
```

****

Program No. 23 SMALLEST ELEMENT IN AN ARRAY

Aim : Write a C program to find the smallest element in an array.

Program:

```
#include<stdio.h>
#include<conio.h>
void main()
{
int a[50],n,small,i;
clrscr();
printf("Enter the no.of elements in the array");
scanf("%d",&n);
printf("Enter the array elements");
for(i=0;i<n;i++)
scanf("%d",&a[i]);
small=a[0];
for(i=1;i<n;i++)
{
if(a[i]<small)
  small=a[i];
 }
printf("Smallest element = %d",small);
getch();
}
```

Result: The program executed successfully and output verified.

Output

```
Enter  the no.of elements in the array 5
Enter the array elements
10 20 30 40 50
Smallest element = 10
```

****

Program No. 24 LINEAR SEARCH

Aim : Write a C program to check the given number is present in an array.

Program:

```
#include<stdio.h>
#include<conio.h>
void main()
{
int a[50],n,s,i,f=0;
clrscr();
printf("Enter the no.of elements in the array");
scanf("%d",&n);
printf("Enter the array elements");
for(i=1;i<=n;i++)
scanf("%d",&a[i]);
printf("Enter the search element");
scanf("%d",&s);
for(i=1;i<=n;i++)
{
if(a[i]==s)
  {
  f=1;
  break;
  }
}
 if(f==1)
   printf("The element %d  is present at location %d",s,i);
else
  printf("Not present");
getch();
 }
```

Result: The program executed successfully and output verified.

Output

```
Enter  the no.of elements in the array 5
Enter the array elements
10 20 30 40 50
Enter the search element 40
The element 40 is present at location 4
Enter  the no.of elements in the array 5
Enter the array elements
10 20 30 40 50
Enter the search element 100
Not present
```

Program No. 25 SORTING

Aim : Write a C program to sort the array elements in ascending order.

Program:

```
#include<stdio.h>
#include<conio.h>
void main()
{
int a[50],n,i,j,t;
clrscr();
printf("Enter the no.of elements in the array");
scanf("%d",&n);
printf("Enter the array elements");
for(i=0;i<n;i++)
scanf("%d",&a[i]);
for(i=0;i<n;i++)
{
for(j=i+1;j<n;j++)
{
if(a[j]<a[i])
{
 t=a[i];
 a[i]=a[j];
 a[j]=t;
 }
 }
 }
printf("The sorted array is:");
for(i=0;i<n;i++)
printf(" %d",a[i]);

getch();
}
```

Result: The program executed successfully and output verified.

Output

```
Enter  the no.of elements in the array 5
Enter the array elements
100 20 3 45 50
The sorted array is: 3 20 45 50 100
```

Program No. 26 MATRIX ADDITION

Aim : Write a C program to find the sum of two matrices.

Program:

```
#include<stdio.h>
#include<conio.h>
void main()
{
int a[5][5],b[5][5],c[5][5],m,n,i,j;
```

```
clrscr();
printf("Enter the no.of rows and columns(mxn):");
scanf("%d%d",&m,&n);
printf("Enter the first matrix elements");
for(i=0;i<m;i++)
for(j=0;j<n;j++)
scanf("%d",&a[i][j]);
printf("Enter the second matrix elements");
for(i=0;i<m;i++)
for(j=0;j<n;j++)
scanf("%d",&b[i][j]);

for(i=0;i<m;i++)
for(j=0;j<n;j++)
c[i][j]=a[i][j]+b[i][j];

printf("The matrix sum is:\n");
for(i=0;i<m;i++)
{
printf("\n");
for(j=0;j<n;j++)
printf("  %d",c[i][j]);
}
 getch();
}
```

Result: The program executed successfully and output verified.

Output

```
Enter  the no.of rows and columns(mxn):  2  2
Enter the first matrix elements
    1    2
    5    1
    Enter the second matrix elements
    2    4
    3    6
    The matrix sum is:
    4    6
    8    7
    ************************************************************
```

Program No. 27 MATRIX MULTIPLICATION

Aim : Write a C program to find the product of two matrices.

Program:

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

```
void main()
{
int a[5][5],b[5][5],c[5][5],m,n,p,q,i,j,k;
clrscr();
printf("Enter the no.of rows and columns(mxn)in first matrix:");
scanf("%d%d",&m,&n);
printf("\nEnter the no.of rows and columns(mxn)in second matrix:");
scanf("%d%d",&p,&q);
if(p!=n)
printf("\nMultiplication not possible");
else
{
printf("Enter the first matrix elements");
for(i=0;i<m;i++)
for(j=0;j<n;j++)
scanf("%d",&a[i][j]);
printf("Enter the second matrix elements");
for(i=0;i<p;i++)
for(j=0;j<q;j++)
scanf("%d",&b[i][j]);
printf("The matrix product is:\n");
for(i=0;i<m;i++)
{
for(j=0;j<q;j++)
{
c[i][j]=0;
for(k=0;k<p;k++)
c[i][j]=c[i][j]+a[i][k]*b[k][j];
}
}
 for(i=0;i<m;i++)
 {
 printf("\n");
 for(j=0;j<q;j++)
 printf("  %d",c[i][j]);
 }
 }//else closing
 getch();
}
```

Result: The program executed successfully and output verified.

Output

```
Enter the no.of rows and columns(mxn)in first matrix:2  2
Enter the no.of rows and columns(mxn)in second matrix:2 2
Enter the first matrix elements
     1    1
```

1 1
Enter the second matrix elements
1 1
1 1
The matrix product is:
2 2
2 2
****

Program No. 28 MATRIX TRANSPOSE

Aim : Write a C program to find the transpose of a matrix.

Program

```
#include<stdio.h>
#include<conio.h>
void main()
{
int a[5][5],t[5][5],m,n,i,j;
clrscr();
printf("Enter the no.of rows and columns(mxn):");
scanf("%d%d",&m,&n);
printf("Enter the  matrix elements");
for(i=0;i<m;i++)
for(j=0;j<n;j++)
scanf("%d",&a[i][j]);
for(i=0;i<m;i++)
for(j=0;j<n;j++)
t[j][i]=a[i][j];
printf("The matrix transpose is:\n");
for(i=0;i<n;i++)
{
printf("\n");
for(j=0;j<m;j++)
printf("  %d",t[i][j]);
 }
 getch();
}
```

Result: The program executed successfully and output verified.

Output

Enter the no.of rows and columns(mxn): 2 2
Enter the matrix elements
1 2
5 1
The matrix transpose is:
1 5
2 1
****

Program No. 29 DIAGONAL SUM

Aim : Write a C program to find the sum of major diagonal elements in a square matrix.

Program

```
#include<stdio.h>
#include<conio.h>
void main()
{
int a[5][5],s=0,m,n,i,j;
clrscr();
printf("Enter the size of square matrix:");
scanf("%d%d",&m,&n);
printf("Enter the  matrix elements");
for(i=0;i<m;i++)
for(j=0;j<n;j++)
scanf("%d",&a[i][j]);
for(i=0;i<m;i++)
for(j=0;j<n;j++)
if(i==j)
s=s+a[i][j];
printf("The diagonal sum is %d:\n",s);
getch();
}
```

Result: The program executed successfully and output verified.

Output

```
Enter  the size of square matrix:  3  3
Enter the matrix elements
    1    2   3
    5    1    4
    2    5   6
    The diagonal sum is  8
    ********************************************************************
```

Program No.30 SUM AND AVERAGE USING FUNCTION

Aim : Write a C program to find the sum and average of three numbers using function.

Program:

```
#include<stdio.h>
#include<conio.h>
void main()
{
int a,b,c,average,avg(int,int,int);
clrscr();
printf("Enter three numbers");
scanf("%d%d%d",&a,&b,&c);
```

```
average=avg(a,b,c);
printf("Average of three numbers is %d",average);
getch();
}
avg(int x,int y,int z)
{
int s;
s=x+y+z;
printf("Sum of three numbers is %d",s);
return s/3;
}
```

Result: The program executed successfully and output verified.

Output

Enter three numbers
10 20 30
Sum of three numbers is 60
Average of three numbers is 20

****

Program No.31 FACTORIAL USING RECURSION

Aim : Write a C program to find the factorial of three numbers using recursion.

Program:

```
#include<stdio.h>
#include<conio.h>
void main()
{
int n,f,fact(int);
clrscr();
printf("Enter the number");
scanf("%d",&n);
f=fact(n);
printf("Factorial of %d is %d",n,f);
 getch();   }
int fact(int x)
{
int ft;
if(x<=1)
return 1;
else
return x*fact(x-1);
}
```

Result: The program executed successfully and output verified.

Output

Enter the number 3
Factorial of 3 is 6

****

Program No.32 CALL BY VALUE

Aim : Write a C program to swap two numbers using call by value.

Program:

```
#include<stdio.h>
#include<conio.h>
void swap(int,int);
void main()
{
int a=100,b=200;
clrscr();
printf("Before swap\n");
printf("a=%d\nb=%d\n",a,b);
swap(a,b);
printf("After swap in main\n");
printf("a=%d\nb=%d",a,b);
getch();
}
void swap(int x,int y)
{
int t;
t=x;
x=y;
y=t;
printf("Value of x and y in swap\n");
printf("x=%d\ny=%d\n",x,y);
}
```

Result: The program executed successfully and output verified.

Output

```
Before swap
a=100
b=200
Value of x and y in swap
x=200
Y=100
After swap in main
a=100
b=200
```

****

Program No.33 CALL BY REFERENCE

Aim : Write a C program to swap two numbers using call by reference.

Program:

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

```
void swap(int *,int *);
void main()
{
int a=100,b=200;
clrscr();
printf("Before swap\n");
printf("a=%d\nb=%d\n",a,b);
swap(&a,&b);
printf("After swap in main\n");
printf("a=%d\nb=%d",a,b);
getch();
}
void swap(int *x,int *y)
{
int *t;
*t=*x;
*x=*y;
*y=*t;
printf("Value of x and y in swap\n");
printf("x=%d\ny=%d\n",*x,*y);
}
```

Result: The program executed successfully and output verified.

Output

Before swap
a=100
b=200
Value of x and y in swap
x=200
Y=100
After swap in main
a=200
b=100

****

34. String Sorting

35. Student Record