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

double mem=0;
int basic();
double phase2();
double phase3();
double phase4();

void main()
{
        clrscr();
        double result=0;
        char ch,ans;
        int choice,count=0;
        do
        {
                if(count>0)
                {
                        clrscr();
                }
                cout<<"\t\tCalculator"<<endl;
                cout<<"                                                  "<<endl<<endl;
                cout<<"Basic Math Functions : +  -  *  / % "<<endl<<endl;
                cout<<"PHASE 2 MATH FUNCTIONS :"<<(char)251;
                cout<<"  3"<<(char)251<<" "<<(char)252<<(char)251;
                cout<<"1/x  x^2 x^3 x^y n!"<<endl<<endl;
                cout<<"PHASE 3 MATH FUNCTIONS :sin,cos,"<<endl;
                cout<<"sin, cos, tan, exp, ln, log, sinh, cosh, tanh, asin, acos, atan"<<endl<<endl;
                cout<<"PHASE 4 MATH FUNCTIONS : nPr  nCr  ";
                cout<<"\nEnter your choice"<<endl<<endl;
                cout<<"BASIC   :1\t PHASE 2 :2\tPHASE 3 :3"<<endl;
                cout<<"\nPHASE 4 :4\t TO EXIT :5"<<endl<<endl;
                cin>>choice;
                if(choice==1)
                {
                        result=basic();
                }
                else if(choice==2)
                {
                        result=phase2();
                }
                else if(choice==3)
                {
                        result=phase3();
                }
                else if(choice==4)
                {
                        result=phase4();
                }
                else if(choice==5)
                exit(0);
                else
```

```
            {
                cout<<"INVALID INPUT"<<endl;
            }
            cout<<"\n\nWould you like to perform any other calculation ?"<<endl;
            cout<<"Press Y to continue"<<endl;
            cout<<"Press N to quit"<<endl;
            cout<<"Press S to view Latest stored Result"<<endl;
            cin>>ans;
            if(ans=='s'||ans=='S')
            {
                cout<<"Stored Result : "<<result;
                getch();
                ans='y';
            }
            count++;
        }
        while(ans=='y'||ans=='Y');
}

int basic()
{
        cout<<"\nFunctions available :+ - * / % "<<endl<<endl;
        double a,b;
        char ch,lbl;
        if(mem!=0)
        {
            cout<<"Stored value in Memory : "<<mem<<endl<<endl;
            cout<<"Recall memory?"<<endl<<endl;
            cout<<"Press Y or N "<<endl;
            cin>>lbl;
            if(lbl=='Y'||lbl=='y')
            {
                a=mem;
                goto label;
            }
        }
        cout<<"First Value:"<<endl;
        cin>>a;
        label:
        cout<<"Operator:"<<endl;
        cin>>ch;
        cout<<"Second Value:"<<endl;
        cin>>b;
        switch(ch)
        {
            case'+':
            {
                cout<<"Result : "<<(a+b);
                mem=(a+b);
                break;
            }
            case'-':
            {
                cout<<"Result : "<<(a-b);
                mem=(a-b);
                break;
```

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            }
            case '*':
            {
                cout<<"Result : "<<(a*b);
                mem=(a*b);
                break;
            }
            case '/':
            {
                if(b==0)
                cout<<"Math error!"<<endl;
                else
                {
                    cout<<"Result : "<<(a/b);
                    mem=(a/b);
                }
                break;
            }
            case '%':
            {
                cout<<"Result : "<<((a*b)/100);
                mem=((a*b)/100);
                break;
            }
        }
        return mem;
}

double phase2()
{

    cout<<"\nFunctions available:"<<endl<<endl;
    cout<<(char)251<<" 3"<<(char)251<<" "<<(char)252<<(char)251;
    cout<<" 1/x  x^2 x^3 x^y n! "<<endl<<endl;

    double a;
    char ch;
    cout<<"\nFirst Value:"<<endl;
    cin>>a;
    cout<<"Enter the Operator"<<endl;
    cout<<"\nPress 's' for Square Root 'c' for Cube Root, 'n' for nthRoot "<<endl;
    cout<<"\n'/' for 1/x   '^' for power and '!' for factorial"<<endl<<endl;
    cin>>ch;
    switch(ch)
    {
        case 's':
        {
            cout<<"Result: "<<sqrt(a);
            mem=sqrt(a);
            break;
        }
        case 'c':
        {
            cout<<"Result: "<<pow(a,(double)(1.0/3.0));
            mem=pow(a,(double)(1.0/3.0));
            break;
```

```
            }
            case 'n':
            {
                double y;
                cout<<"Exponent :"<<endl;
                cin>>y;
                cout<<"Result: "<<pow(a,(double)(1.0/y));
                mem=pow(a,(double)(1.0/y));
                break;
            }
            case '/':
            {
                cout<<"Result : "<<(1.0/a);
                mem=1.0/a;
                break;
            }
            case '^':
            {
                int x;
                cout<<"Exponent :"<<endl;
                cin>>x;
                cout<<"Result : "<<pow(a,x);
                mem=pow(a,x);
                break;
            }
            case '!':
            {
                double fact=1;
                for(int i=1;i<=a;i++)
                {
                    fact=fact*i;
                }
                cout<<"Result : "<<fact;
                mem=fact;
                break;
            }
        }
        return mem;
}

double phase3()
{

    cout<<"\nYou can perform functions like :"<<endl;
    cout<<"sin,cos,tan,exp,ln,log,sinh,cosh,tanh,";
    cout<<"asin,acos,atan "<<endl<<endl;

    double a,PI=3.14159265,mem;
    char ch;
    cout<<"Enter the First Value"<<endl;
    cin>>a;
    cout<<"Enter the Operator"<<endl;
    cout<<"Press S : To Find out Sin Value"<<endl;
    cout<<"Press C : To Find out Cos Value"<<endl;
    cout<<"Press T : To Find out Tan Value"<<endl;
    cout<<"Press E : To Find out Exp Value"<<endl;
```

```
        cout<<"Press I : To Find ln  Function"<<endl;
        cout<<"Press L : To Find Log Function"<<endl;
        cout<<"Press 1 : To Find Out Sinh Value"<<endl;
        cout<<"Press 2 : To Find Out Cosh Value"<<endl;
        cout<<"Press 3 : To Find Out Tanh Value"<<endl;
        cout<<"Press 4 : To Find Out Asin Value"<<endl;
        cout<<"Perss 5 : To Find Out Acos Value"<<endl;
        cout<<"Press 6 : To Find Out Atan Value"<<endl;
        cin>>ch;
        switch(ch)
        {
                case 'S':
                case 's':
                {
                        cout<<"Result : "<<sin(a*PI/180);
                        mem=sin(a*PI/180);
                        break;
                }
                case 'C':
                case 'c':
                {
                        cout<<"Result : "<<cos(a*PI/180);
                        mem=cos(a*PI/180);
                        break;
                }
                case 'T':
                case 't':
                {
                        cout<<"Result : "<<tan(a*PI/180);
                        mem=tan(a*PI/180);
                        break;
                }
                case 'E':
                case 'e':
                {
                        cout<<"Result : "<<exp(a);
                        mem=exp(a);
                        break;
                }
                case 'I':
                case 'i':
                {
                        cout<<"Result : "<<log(a);
                        mem=log(a);
                        break;
                }
                case 'L':
                case 'l':
                {
                        cout<<"Result : "<<log10(a);
                        mem=log10(a);
                        break;
                }
                case '1':
                {
                        cout<<"Result : "<<sinh(a*PI/180);
```

```
                mem=sinh(a*PI/180);
                break;
            }
            case '2':
            {
                cout<<"Result : "<<cosh(a*PI/180);
                mem=cosh(a*PI/180);
                break;
            }
            case '3':
            {
                cout<<"Result : "<<tanh(a*PI/180);
                mem=tanh(a*PI/180);
                break;
            }
            case '4':
            {
                cout<<"Result : "<<asin(a*PI/180);
                mem=asin(a*PI/180);
                break;
            }
            case '5':
            {
                cout<<"Result : "<<acos(a*PI/180);
                mem=acos(a*PI/180);
                break;
            }
            case '6':
            {
                cout<<"Result : "<<atan(a*PI/180);
                mem=atan(a*PI/180);
                break;
            }

        }
        return mem;
}

double phase4()
{
        int i,n,r,s,f1,f2,f3,f4;
        char ch;
        cout<<"\nPress p for permutation and c for combination"<<endl;
        cin>>ch;
        switch(ch)
        {
            case 'c':
            case 'p':
            case 'C':
            case 'P':
            {
                cout<<"Enter the value of n and r"<<endl;
                cin>>n>>r;
                if(n>=0 && r>=0 && r<=n)
                {
                    f1=f2=f3=1;
```

```
                f4=n-r;
                for(i=1;i<=n;i++)
                f1=f1*i;
                for(i=1;i<=r;i++)
                f2=f2*i;
                for(i=1;i<=f4;i++)
                f3=f3*i;
                if(ch=='p'||ch=='P')
                {
                        s=f1/f3;
                        mem=s;
                        cout<<"The permutation value is :"<<s<<endl;
                }
                else if(ch=='c'||ch=='C')
                {
                        s=f1/(f2*f3);
                        mem=s;
                        cout<<"The combination value is :"<<s<<endl;
                }
            }
            else
            cout<<"Calculation cannot be performed"<<endl;
            break;
        }
    }
    return mem;
}
```