**Assignment-25 Solution Name: Om Pant**

1. Define a class Complex to represent a complex number. Declare instance member variables to store real and imaginary part of a complex number, also define instance member functions to set values of complex number and print values of complex number.

Ans-

#include<iostream>

using namespace std;

class Complex

{

    int real;

    int imaginary;

    public:

        int getReal(){

            return real;

        }

        int getImg(){

            return imaginary;

        }

        void setReal(int n){

            real = n;

        }

        void setImg(int m){

            imaginary = m;

        }

};

int main(){

    Complex x;

    int a,b;

    cout<<"Enter Real and imaginary part of Complex number : ";

    cin>>a>>b;

    x.setReal(a);

    x.setImg(b);

    if(x.getImg()>0)

        cout<<"Complex number Entered: "<<x.getReal()<<"+"<<x.getImg()<<"i "<<endl;

    else

        cout<<"Complex number Entered: "<<x.getReal()<<""<<x.getImg()<<"i "<<endl;

    return 0;

}

1. Define a class Time to represent Time (like 3 hr 45 min 20 sec). Declare appropriate number of instance member variables and also define instance member functions to set values for time and display values of time.

Ans-

// 2.   Define a class Time to represent Time (like 3 hr 45 min 20 sec). Declare appropriate  number of instance member variables and also define instance member functions to set  values for time and display values of time.

#include<iostream>

using namespace std;

class Time{

    int hr,mt,sc;

    public:

    int getHour(){

        return hr;

    }

    int getMinute(){

        return mt;

    }

    int getSecond(){

        return sc;

    }

    void setHour(int a){

        if(a>=0 && a<=23){

            hr = a;

        }

        else

            cout<<"Enter valid Hour"<<endl;

    }

    void setMinute(int b){

        if(b>=0 && b <=59){

            mt = b;

        }

        else

            cout<<"Enter valid minutes"<<endl;

    }

    void setSecond(int c){

        if(c>=0 && c <=59){

            sc = c;

        }

        else

            cout<<"Enter valid seconds"<<endl;

    }

    int validTime(){

        if ((hr>=0 && hr<=23) && (mt>=0 && mt <=59) && (sc>=0 && sc <=59)){

            return 1;

        }

        return 0;

    }

};

int main(){

    Time t;

    int a,b,c;

    cout<<"Enter Time (hh mm ss) : ";

    cin>>a>>b>>c;

    t.setHour(a);

    t.setMinute(b);

    t.setSecond(c);

    if(t.validTime())

        cout<<"Time: "<<t.getHour()<<" hr "<<t.getMinute()<<" min "<<t.getSecond()<<" sec "<<endl;

    return 0;

}

1. Define a class Factorial and define an instance member function to find the Factorial of a number using class.

Ans-

// 3.   Define a class Factorial and define an instance member function to find the Factorial of a  number using class.

#include<iostream>

using namespace std;

class Factorial{

    public:

        int factorial(int num){

            int i,fact=1;

            for(i =1;i<=num;i++)

                fact \*= i;

            return fact;

        }

};

int main(){

    Factorial f;

    int x;

    cout<<"Enter a number to find factorial: ";

    cin>>x;

    cout<<"Factorial of "<<x<<" : "<<f.factorial(x)<<endl;

    return 0;

}

1. Define a class LargestNumber and define an instance member function to find the Largest of three Numbers using the class.

Ans-

// 4.   Define a class LargestNumber and define an instance member function to find the  Largest of three Numbers using the class.

#include<iostream>

using namespace std;

class LargestNumber

{

    public:

        int largest(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;

            }

        }

};

int main(){

    LargestNumber num;

    int x,y,z;

    cout<<"Enter three numbers to find largest among them: "<<endl;

    cin>>x>>y>>z;

    cout<<"Largest is: "<<num.largest(x,y,z)<<endl;

    return 0;

}

1. Define a class ReverseNumber and define an instance member function to find Reverse of a Number using class.

Ans-

// 5.   Define a class ReverseNumber and define an instance member function to find Reverse  of a Number using class.

#include<iostream>

using namespace std;

class ReverseNumber{

    public:

        int revNumber(int num){

            int n=0,t;

            while(num  != 0){

                t = num%10;

                n  = n\*10 + t;

                num = num/10;

            }

            return n;

        }

};

int main(){

    ReverseNumber number;

    int n;

    cout<<"Enter a number to find reverse: ";

    cin>>n;

    cout<<"Reverse of "<<n<<" is : "<<number.revNumber(n);

    return 0;

}

1. Define a class Square to find the square of a number and write a C++ program to Count number of times a function is called.

Ans-

// 6.   Define a class Square to find the square of a number and write a C++ program to Count  number of times a function is called.

#include<iostream>

using namespace std;

class Square{

    public:

    int square(int n){

        return n\*n;

    }

};

int main(){

    Square s;

    int x;

    cout<<"Enter a number to find square: ";

    cin>>x;

    cout<<"Square: "<<s.square(x)<<endl;

    return 0;

}

1. Define a class Greatest and define instance member function to find Largest among 3 numbers using classes.

Ans-

// 7.   Define a class Greatest and define instance member function to find Largest among 3  numbers using classes.

#include<iostream>

using namespace std;

class Greatest

{

    public:

        int largest(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;

            }

        }

};

int main(){

    Greatest num;

    int x,y,z;

    cout<<"Enter three numbers to find largest among them: "<<endl;

    cin>>x>>y>>z;

    cout<<"Largest is: "<<num.largest(x,y,z)<<endl;

    return 0;

}

1. Define a class Rectangle and define an instance member function to find the area of the rectangle.

Ans-

// 8.   Define a class Rectangle and define an instance member function to find the area of the  rectangle.

#include<iostream>

using namespace std;

class Rectangle{

    int length,bredth;

    public:

        int area(){

            return length\*bredth;

        }

        void setLength(int x){

            length = x;

        }

        void setBredth(int y){

            bredth = y;

        }

};

int main(){

    Rectangle r;

    int len,bred;

    cout<<"Enter Length and Bredth of rectangle:  ";

    cin>>len>>bred;

    r.setLength(len);

    r.setBredth(bred);

    cout<<"Area of rectangle: "<<r.area()<<endl;

    return 0;

}

1. Define a class Circle and define an instance member function to find the area of the circle.

Ans-

// 9.   Define a class Circle and define an instance member function to find the area of the  circle.

#include<iostream>

using namespace std;

class Circle{

    public:

        float areaOfCircle(float x){

            return (3.141 \*x\*x) ;

        }

};

int main(){

    float radius;

    Circle c;

    cout<<"Enter radius of circle: ";

    cin>>radius;

    cout<<"Area of Circle: "<<c.areaOfCircle(radius)<<endl;

}

1. Define a class Area and define instance member functions to find the area of the different shapes like square, rectangle , circle etc.

Ans-

// 10. Define a class Area and define instance member functions to find the area of the  different shapes like square, rectangle , circle etc.

#include<iostream>

using namespace std;

class Area{

    public:

        float areaOfCircle(float x){

            return (3.141 \*x\*x) ;

        }

        int areaOfSquare(int a){

            return a\*a;

        }

        int areaOfrectangle(int p,int q){

            return p\*q;

        }

};

int main(){

    Area a;

    int i=1;

    int choice,radius,side,length,bredth;

    while(i){

        cout<<endl;

        cout<<"Enter Your Choice: "<<endl<<"1. Calculate area of circle"<<endl<<"2. Calculate area of Square"<<endl<<"3. Calculate area of rectangle"<<endl<<"4. Exit.."<<endl;

        cin>>choice;

        fflush(stdin);

        switch(choice){

        case 1:

                cout<<"Enter radius of circle: ";

                cin>>radius;

                cout<<"Area: "<<a.areaOfCircle(radius)<<endl;

                break;

        case 2:

                cout<<"Enter a side of square: ";

                cin>>side;

                cout<<"Area: "<<a.areaOfSquare(side)<<endl;

                break;

        case 3:

                cout<<"Enter Length and bredth of rectangle : ";

                cin>>length>>bredth;

                cout<<"Area: "<<a.areaOfrectangle(length,bredth)<<endl;

                break;

        case 4:

                i = 0;

                break;

        default:

                cout<<"Enter a valid Choice"<<endl;

                break;

        }

    }

}