**LABSHEET-9**

Polymorphism:

1. To be familiar with polymorphism concept.

1.SOURCE CODE:

#include<iostream>

using namespace std;

class Area{

private:

int length , height;

float breadth;

public:

void area(int a, int b){

length = a;

height = b;

cout<<"The area of triangle is => "<<((length \* height)/2)<<endl;

}

void area(int a){

length = a;

cout<<"The area of square is => "<<(length \* length)<<endl;

}

void area(int a, float x){

length = a;

breadth = x;

cout<<"The area of rectangle is => "<<(length \* breadth)<<endl;

}

};

int main(){

Area a1;

a1.area(4,3);

a1.area(6);

a1.area(8,3.63f);

return 0;

}

OUTPUT:

The area of triangle is => 6

The area of square is => 36

The area of rectangle is => 29.04

--------------------------------

Process exited after 0.09244 seconds with return value 0

Press any key to continue . . .

2.SOURCE CODE:

#include<iostream>

using namespace std;

class unary{

int x, y;

public:

void getdata(int a, int b){

x=a;

y=b;

}

void operator -(){

x= -x;

y= -y;

}

void display(){

cout<<"X = "<<x<<endl;

cout<<"Y = "<<y<<endl;

}

};

int main(){

unary u1;

u1.getdata(223,78);

cout<<"The value before operator overloading:"<<endl;

u1.display();

-u1;

cout<<"The value after operator overloading:"<<endl;

u1.display();

return 0;

}

OUTPUT:

The value before operator overloading:

X = 223

Y = 78

The value after operator overloading:

X = -223

Y = -78

--------------------------------

Process exited after 0.06746 seconds with return value 0

Press any key to continue . . .

3.SOURCE CODE:

#include<iostream>

using namespace std;

class fibonacci{

private:

int x , y, z;

public:

fibonacci(){

x=-1;

y=1;

z= x + y;

}

void operator ++(){

x=y;

y=z;

z=x+y;

}

void display(){

cout<<z<<" "<<endl;

}

};

int main(){

fibonacci f;

int n,i;

cout<<"Enter the number of terms:"<<endl;

cin>>n;

for(i=0;i<n; i++){

f.display();

++f;

}

return 0;

}

OUTPUT:

Enter the number of terms:

4

0

1

1

2

--------------------------------

Process exited after 2.842 seconds with return value 0

Press any key to continue . . .

4.SOURCE CODE:

#include<iostream>

using namespace std;

class complex{

private:

int real, imag;

public:

complex(){

}

complex(int r, int i){

real = r;

imag = i;

}

complex operator +(complex c1){//taking one argument just to distinguish one input value from another....

complex temp;

temp.real = c1.real + real;

temp.imag = c1.imag + imag;

return temp;

}

void display(){

cout<<real<<" + "<<imag<<"i"<<endl;

}

};

int main(){

complex c1(4,7);

complex c2(5,2);

cout<<"The value of first complex number:"<<endl;

c1.display();

cout<<"The value of second complex number:"<<endl;

c2.display();

complex c3;

cout<<"The value of complex number after addition is => ";

c3 = c1 + c2;

c3.display();

return 0;

}

OUTPUT:

The value of first complex number:

4 + 7i

The value of second complex number:

5 + 2i

The value of complex number after addition is => 9 + 9i

--------------------------------

Process exited after 0.07765 seconds with return value 0

Press any key to continue . . .

5.SOURCE CODE:

#include<iostream>

using namespace std;

class vector{

private:

int i, j, k;

public:

vector(){

}

vector(int a, int b, int c){

i = a;

j = b;

k = c;

}

void display(){

cout<<i<<"i "<<j<<"j "<<k<<"k"<<endl;

}

friend vector operator +(vector v1, vector v2);

};

vector operator +(vector v1, vector v2){

vector temp;

temp.i = v1.i + v2.i;

temp.j = v1.j + v2.j;

temp.k = v1.k + v2.k;

return temp;

}

int main(){

vector v1(3, 5, 9);

vector v2(8, 3, 3);

cout<<"The value of first vector:"<<endl;

v1.display();

cout<<"The value of second vector:"<<endl;

v2.display();

vector v3;

v3 = v1 + v2;

cout<<"The value of vector after addition is => ";

v3.display();

return 0;

}

OUTPUT:

The value of first vector:

3i 5j 9k

The value of second vector:

8i 3j 3k

The value of vector after addition is => 11i 8j 12k

--------------------------------

Process exited after 0.091 seconds with return value 0

Press any key to continue . . .

6.SOURCE CODE:

#include<iostream>

using namespace std;

class student{

protected:

char name[30];

int year, month , day;

int roll;

public:

void getdata(){

cout<<"Enter the name of student:"<<endl;

cin>>name;

cout<<"Enter the date of birth:(year/month/day)"<<endl;

cin>>year>>month>>day;

cout<<"Enter the roll no:"<<endl;

cin>>roll;

}

int discount(){

int d = 1000;

return d;

}

};

class PG: public student{

public:

virtual void dispresult(){

cout<<"Name => "<<name<<endl;

cout<<"Date of birth => "<<year<<"/ "<<month<<"/ "<<day<<endl;

cout<<"Roll no => "<<roll<<endl;

cout<<"Fee Discout => "<<discount()<<endl;

}

};

class UG: public student{

public:

virtual void dispresult(){

cout<<"Name => "<<name<<endl;

cout<<"Date of birth => "<<year<<"/ "<<month<<"/ "<<day<<endl;

cout<<"Roll no => "<<roll<<endl;

cout<<"Fee Discout => "<<discount()<<endl;

}

};

int main(){

PG pg;

cout<<"Fill out the information of {}G's student:"<<endl;

pg.getdata();

cout<<"The details of students in PG are....."<<endl;

PG \*pptr;

pptr=&pg;

pptr->dispresult();

UG ug;

cout<<"Fill out the information of UG's student:"<<endl;

ug.getdata();

cout<<"The details of students in UG are........"<<endl;

UG \*uptr;

uptr = &ug;

uptr->dispresult();

return 0;

return 0;

}

7.SOURCE CODE:

#include<iostream>

using namespace std;

class shape{

public:

int base, height;

void getdata(){

cout<<"Enter the value of base:"<<endl;

cin>>base;

cout<<"Enter the value of height:"<<endl;

cin>>height;

}

virtual void area()=0;

};

class triangle: public shape{

public:

void area(){

float tarea;

tarea = 0.5 \* (base \* height);

cout<<"The area of triangle is => "<<tarea<<endl;

}

};

class rectangle: public shape{

public:

void area(){

float rarea;

rarea = base \* height;

cout<<"The area of rectangle is => "<<rarea<<endl;

}

};

int main(){

shape \*sptr;

triangle t;

t.shape::getdata();

sptr = &t;

sptr->area();

rectangle r;

r.shape::getdata();

sptr = &r;

sptr->area();

return 0;

}

OUTPUT:

Enter the value of base:

4

Enter the value of height:

7

The area of triangle is => 14

Enter the value of base:

23

Enter the value of height:

78

The area of rectangle is => 1794

--------------------------------

Process exited after 24.52 seconds with return value 0

Press any key to continue . . .