**LAB-SHEET 7**

Object inheritance and reusability:

1. To be familiar with inheritance and compositions.
2. To understand about how inheritance supports reusability.
3. To understand about ambiguity and virtual base class.

**1.SOURCE CODE:**

#include<iostream>

using namespace std;

class A{

private:

int x;

protected:

int z;

public:

int y;

void getdata(){

cout<<"Enter the value of x, y and z:"<<endl;

cin>>x>>y>>z;

}void display(){

cout<<"x="<<x<<endl<<"y="<<y<<endl<<"z="<<z<<endl;

}

};

class B: public A{

private:

int k, sum;

public:

void getk(){

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

cin>>k;

}

void addition(){

sum = y + z + k;

cout<<"The sum is => "<<sum<<endl;

}};

int main(){

B b1;

b1.getdata();

b1.display();

b1.getk();

b1.addition();

return 0;

}

**OUTPUT:**

Enter the value of x, y and z:

4

7

9

x=4

y=7

z=9

Enter the value of k:

3

The sum is => 19

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

Process exited after 20.26 seconds with return value 0

Press any key to continue . . .

2.SOURCE CODE:

#include<iostream>

using namespace std;

class A{

protected:

char name[30];

char address[50];

public:

void getdata(){

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

cin>>name;

cout<<"Enter the address:"<<endl;

cin>>address;

}

};

class B{

protected:

char college\_name[50];

int roll;

public:

void getdata(){

cout<<"Enter the college name:"<<endl;

cin>>college\_name;

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

cin>>roll;

}

};

class student: public A, public B{

protected:

char program[30];

public:

void getdata(){

cout<<"Enter the program:"<<endl;

cin>>program;

}

void display(){

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

cout<<"Address => "<<address<<endl;

cout<<"College Name => "<<college\_name<<endl;

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

cout<<"Program => "<<program<<endl;

}

};

int main(){

int n,i;

student s1;

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

cin>>n;

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

cout<<"Enter the details of student "<<i+1<<endl;

s1.A::getdata();

s1.B::getdata();

s1.getdata();

}

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

cout<<"The details of students "<<i+1<<endl;

s1.display();

}

return 0;

}

3.SOURCE CODE:

#include<iostream>

using namespace std;

class staff{

public:

int staff\_id;

char name[30];

void getdata(){

cout<<"Enter the staff id no:"<<endl;

cin>>staff\_id;

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

cin.get(name,30);

}

void display(){

cout<<"Staff ID:"<<staff\_id<<endl;

cout<<"Name:"<<name<<endl;

}

};

class lecturer: public staff{

char subject[30];

protected:

char department[30];

public:

void getdata(){

cout<<"Enter the subject taught:"<<endl;

cin.get(subject,30);

cout<<"Enter the department affiliated to:"<<endl;

cin.get(department,30);

}

void display(){

cout<<"Suject => "<<subject<<endl;

cout<<"Department => "<<department<<endl;

}

};

class Administrative\_staff:public staff,public lecturer{

char post[30];

public:

void getdata(){

cout<<"Enter the post:"<<endl;

cin.get(post,30);

cout<<"Enter the department:"<<endl;

cin.get(department,30);

}

void display(){

cout<<"Post: "<<post<<endl;

cout<<"Department: "<<department<<endl;

}

};

int main(){

int i,n;

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

cin>>n;

lecturer l1;

Administrative\_staff a1;

cout<<"Enter the information of staffs:"<<endl;

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

cout<<"STAFF"<<endl;

l1.staff::getdata();

}

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

cout<<"ADMINISTRATIVE STAFF:"<<endl;

a1.staff::getdata();

a1.getdata();

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

l1.staff::getdata();

l1.getdata();

}

return 0;

}

4.SOURCE CODE:

#include<iostream>

#include<string.h>

using namespace std;

class student{

char name[30];

int roll;

public:

void getdata(char n[], int r){

strcpy(name,n);

roll=r;

}

void display(){

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

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

}

};

class marks: public student{

protected:

int sessional1, sessional2;

public:

void getdata(int s1,int s2){

sessional1 = s1;

sessional2 = s2;

}void display(){

cout<<"Marks of sessional 1 => "<<sessional1<<endl;

cout<<"Marks of sessional 2 => "<<sessional2<<endl;

}

};

class result: public marks{

private:

int sum;

public:

void display(){

cout<<"The total sum of result is => "<<(sum=(sessional1+sessional2))<<endl;

}

};

int main(){

result r1;

r1.student::getdata("Arush",34);

r1.student::display();

r1.marks::getdata(56,78);

r1.marks::display();

r1.display();

return 0;

}

OUTPUT:

Name => Arush

Roll no => 34

Marks of sessional 1 => 56

Marks of sessional 2 => 78

The total sum of result is => 134

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

Process exited after 0.05013 seconds with return value 0

Press any key to continue . . .

5.SOURCE CODE:

#include <iostream>

using namespace std;

class student {

char name[30];

int roll;

public:

void getdata(){

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

cin.get(name,30);

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

cin>>roll;

}

void display(){

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

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

}

};

class test: public student{

public:

int math, eng;

void getdata(){

cout<<"Enter the obtained marks in Maths:"<<endl;

cin>>math;

cout<<"Enter the obtained marks in English:"<<endl;

cin>>eng;

}

void display(){

cout<<"Marks in MATHs => "<<math<<endl;

cout<<"Marks in ENGLISH => "<<eng<<endl;

}

};

class sports{

protected:

int score;

public:

void getdata(){

cout<<"Enter the score of sports:"<<endl;

cin>>score;

}

void display(){

cout<<"Score of sports => "<<score<<endl;

}

};

class result: public test, public sports{

int total;

public:

void sum(){

total = math + eng + score;

cout<<"The total marks obtained => "<<total<<endl;

}

};

int main(){

result r1;

r1.student::getdata();

r1.test::getdata();

r1.sports::getdata();

cout<<"The result of the student is as follow:"<<endl;

r1.student::display();

r1.test::display();

r1.sports::display();

r1.sum();

return 0;

}

Enter name of the student:

Bikash

Enter the roll no:

7

Enter the obtained marks in Maths:

89

Enter the obtained marks in English:

43

Enter the score of sports:

90

The result of the student is as follow:

Name => Bikash

Roll no => 7

Marks in MATHs => 89

Marks in ENGLISH => 43

Score of sports => 90

The total marks obtained => 222

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Process exited after 25.72 seconds with return value 0

Press any key to continue . . .

6.SOURCE CODE:

#include<iostream>

using namespace std;

class staff{

char name[30];

int code;

public:

void getdata(){

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

cin.get(name,30);

cout<<"Enter the code:"<<endl;

cin>>code;

}

void display(){

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

cout<<"Code => "<<code<<endl;

}

};

class teacher: public staff{

char subject[20], publication[30];

public:

void getdata(){

cout<<"Enter the subject taught:"<<endl;

cin>>subject;

cout<<"Enter the publication of subject:"<<endl;

cin>>publication;

}

void display(){

cout<<"Subject taught => "<<subject<<endl;

cout<<"Publication => "<<publication<<endl;

}

};

class officer: public staff{

char post[30];

public:

void gatadata(){

cout<<"Enter post of the officer:"<<endl;

cin.get(post,30);

}

void display(){

cout<<"POST => "<<post<<endl;

}

};

class typist: public staff{

int speed;

public:

void getdata(){

cout<<"Enter the speed of typist (word per minute):"<<endl;

cin>>speed;

}

void display(){

cout<<"Typing speed => "<<speed<<endl;

}

};

class regular: public typist{

int salary;

public:

void getdata(){

cout<<"Enter the salary of typist:"<<endl;

cout<<salary;

}

void display(){

cout<<"Salary => "<<salary<<endl;

}

};

class casual: public typist{

int daily\_wadges;

public:

void getdata(){

cout<<"Enter daily wadges of part timer:"<<endl;

cin>>daily\_wadges;

}

void display(){

cout<<"Daily wadges of part timer => "<<daily\_wadges<<endl;

}};

int main(){

teacher t;

t.staff::getdata();

t.getdata();

t.staff::display();

t.display();

officer o;

o.staff::getdata();

o.getdata();

o.staff::display();

o.display();

regular r;

r.staff::getdata();

r.typist::getdata();

r.getdata() ;

r.staff::display();

r.typist::display();

r.display();

casual c;

c.staff::getdata();

c.typist::getdata();

c.getdata();

c.staff::display();

c.typist::display();

c.display();

return 0;

}

#include<iostream>

#include<string.h>

using namespace std;

class person{

public:

char name[30];

int code;

person(char n[], int c){

strcpy(name,n);

code = c;

}

void display(){

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

cout<<"Code => "<<code<<endl;

}

};

class account: virtual public person{

public:

int pay;

account( char n[], int c, int p): person(n,c){

pay = p;

}

void display(){

cout<<"Pay => "<<pay<<endl;

}

};

class admin:virtual public person{

public:

int experiance;

admin( char n[], int c, int e): person(n,c){

experiance = e;

}

void display(){

cout<<"Experiance (In )=> "<<experiance<<endl;

}

};

class master: public account, public admin{

public:

master(char n[], int c, int p, int e ): account(n,c,p), admin(n,c,e), person(n,c){

}

};

int main(){

master m("Natsu", 476, 75000, 3);

cout<<"Details of Employee:"<<endl;

m.person::display();

m.account::display();

m.admin::display();

return 0;

}

OUTPUT:

Details of Employee:

Name => Natsu

Code => 476

Pay => 75000

Experiance (In )=> 3

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

Process exited after 0.05836 seconds with return value 0

Press any key to continue . . .

8.SOURCE CODE:

#include<iostream>

using namespace std;

class person{

private:

char name[30];

int age;

public:

void getdata(){

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

cin.get(name,30);

cout<<"Enter the age:"<<endl;

cin<<age;

}

void display(){

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

cout<<"Age => "<<age<<endl;

}

};

class reservation: public person{

private:

int rid;

int y,m,d;

person p;

public:

void getdata(){

p.getdata();

cout<<"What is the reservation id no. ?"<<endl;

cin>>rid;

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

cin>>y>>m>>d;

}

void display(){

p.display();

cout<<"Reservation id => "<<rid;

cout<<"Date => "<<endl;

}

};

int main(){

reservation r;

r.getdata();

r.display();

return 0;

}

OUTPUT:

Enter the name of person:

Biraj

Enter the age:

29

What is the reservation id no. ?

38839

Enter the date (year/month/day)

2079

11

2

Name => Biraj

Age => 29

Reservation id => 38839

Date => 2079/11/2

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

Process exited after 22.11 seconds with return value 0

Press any key to continue . . .

9.SOURCE CODE:

#include<iostream>

using namespace std;

class base{

protected:

int i1,j1,k1,i2,j2,k2,i,j,k;

public:

void getdata(){

cout<<"Enter the coordinate of vector1:"<<endl;

cin>>i1>>j1>>k1;

cout<<"Enter the coordinates of vector2:"<<endl;\

cin>>i2>>j2>>k2;

}

friend void display(base b);

};

class derived: public base{

public:

void add\_vector(){

i = i1 + i2;

j = j1 + j2;

k = k1 + k2;

}

};

void display( base b){

cout<<"The vector coordinates after addition:"<<endl;

cout<<b.i<<"i + "<<b.j<<"j + "<<b.k<<"k"<<endl;

}

int main(){

derived d;

d.getdata();

d.add\_vector();

display(d);

return 0;

}

OUTPUT:

**Enter the coordinate of vector1:**

**4**

**8**

**3**

**Enter the coordinates of vector2:**

**8**

**9**

**1**

**The vector coordinates after addition:**

**12i + 17j + 4k**

**--------------------------------**

**Process exited after 8.989 seconds with return value 0**

**Press any key to continue . . .**