**OOP Assignment 3**

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**1) SINGLE INHERITANCE**

When a child inherits the wealth and property of his father so it becomes single inheritance.

**#include<iostream>**

**using namespace std;**

**class Father{ //base classs**

**public:**

**double money;**

**string house;**

**string car;**

**Father():money(999999),house("VILLA"),car("Porshe"){**

**}**

**};**

**class Child:protected Father{ //single inheritance, derived class**

**public:**

**Child(){**

**cout<<"The child owns: "<<endl;**

**cout<<"House: "<<house<<endl;**

**cout<<"Money: "<<money<<endl;**

**cout<<"Car: "<<car<<endl;**

**}**

**};**

**int main(){**

**Child Ali;**

**}**

**2) MULTI LEVEL INHERITANCE**

Just like a child has inherited things from his father, likewise his father might have inherited the same thing from his father that is the grandfather of the child.

#include<iostream>

using namespace std;

**class Grandfather{**

**public:**

**string factory;**

**Grandfather():factory("TIMBER FACTORY"){**

**}**

**};**

**class Father:public Grandfather{ //base classs**

**public:**

**double money;**

**string house;**

**string car;**

**Father():money(999999),house("VILLA"),car("Porshe"){**

**}**

**};**

**class Child:protected Father{ //single inheritance, derived class**

**public:**

**Child(){**

**cout<<"The child owns: "<<endl;**

**cout<<"House: "<<house<<endl;**

**cout<<"Money: "<<money<<endl;**

**cout<<"Car: "<<car<<endl;**

**cout<<"Factory: "<<factory<<endl;**

**}**

**};**

**int main(){**

**Child Ali;**

**}**

**3) MUTIPLE INHERITANCE**

Like there is a class of mammals and the land creatures so the inherited multiple class can be of Lion that can have features of mammals as it is one along with features of land animal.

**#include<iostream>**

**using namespace std;**

**class Mammals{**

**public:**

**string coat="Hair/fur";**

**string heart="Four chambered heart";**

**};**

**class Landcreatures{**

**public:**

**int run=55;**

**eat(){**

**cout<<"Eat using a claw or hand"<<endl;**

**}**

**};**

**class Lion:protected Mammals,Landcreatures{**

**public:**

**Lion(){**

**cout<<"Lion has: "<<endl;**

**cout<<coat<<endl;**

**cout<<heart<<endl;**

**cout<<"Speed: "<<run<<endl;**

**cout<<eat();**

**}**

**};**

**int main(){**

**Lion a;**

**}**

**4) HIERARCHICAL INHERITANCE**

There is a class vehicle which has three sub classes of car, bike and bus. Further the class Car can have Audi which would have further extended subclasses.This type of inheritance forms a hierarchy.

**#include<iostream>**

**using namespace std;**

**class Vehicle{**

**public:**

**string model;**

**int speed;**

**int nowheel;**

**};**

**class Car:public Vehicle{**

**public:**

**int cc;**

**Car():model("MERCEDEZ BENZ"),speed(250),nowheel(4),cc(1800){**

**}**

**};**

**class Bike:protected Vehicle{**

**int brakes;**

**public:**

**Bike():model("Kawasaki Ninja"),speed(280),nowheel(2),brakes(3){**

**}**

**};**

**class Bus:protected Vehicle{**

**int passengerseat;**

**public:**

**Bus():model("Highway Runner"),speed(200),nowheel(6),passengerseat(150){**

**}**

**};**

**int main(){**

**Bus b1;**

**}**

**5) HYBRID INHERITANCE**

There is a class university which has sub class departments, then it has sub class students. This inheritance is going like multi-level but if there is also a class of marks that is inherited by student so now there is multiple inheritance too. Hence a hybrid model of inheritance is formed.

**#include<iostream>**

**using namespace std;**

**class University{**

**};**

**class Departments:public University{**

**};**

**class Marks{**

**};**

**class Students:public Departments,Marks{ //multiple inheritance**

**};**

**int main(){**

**Students s1;**

**}**