**0//ตัวอย่างที่ 1//Implementation for Composition**

class A {

B

A

private int a;

public A() {a=0;} //constructor 1

public A(int x){a=x;} //constructor 2

public int getData() {

return a;

 }

public void setData(int x) {

 a=x;

 }

 } //end class A

class B{

private int b;

private A objA;

public B() {b = 0; objA = new A();} //constructor 1

public B(int valB) { b = valB; objA = new A();} //constructor 2

public B(int valB, int valA) {b = valB; objA = new A(valA);} //constructor 3

public void setB(int valB) {

b=valB;

}

public void setA(int valA) {

objA.setData(valA);

}

public void display() {

System.out.println("b = " + b + " a in objA = " + objA.getData());

 }

} //end class B

public class JavaApp {

public static void main(String[] args) {

 B objB1 = new B();

objB1.setB(1);

objB1.setA(101);

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b = 1 a in objA = 101

b = 2 a in objA = 201

b = 3 a in objA = 301

 B objpB2=new B(2);

objpB2.setA(201);

 B objB3 = new B(3,301);

objB1.display();

objpB2.display();

objB3.display();

 }

 }

**//ตัวอย่างที่ 2 //Implementation for Composition and Aggregation**

Faculty

Building

Room

class Room {

 private String rname; //ชื่อห้อง

 public Room(){};

 public Room( String n){ rname = n;};

 public String getName() {return rname;} ;

 public void setName( String n ){ rname=n; };

 } //end class Room

class Building {

 private int buildingId; //รหัสตึก

 private String buildingName; //ชื่อตึก

 private Room [] room= new Room[10]; //ห้องในตึก

 private int nRoom; //จำนวนห้อง

 public Building(){nRoom = 0;}; //constructor1, automatically call Room()

//so Room() must be declared

 public Building(int id, String n){ //constructor2

 buildingId = id;

 buildingName =n;

 nRoom=0;

 }

 public void setId(int id) {buildingId=id;}

 public void setName(String n) {buildingName = n;}

 public String getName() {return buildingName;}

 public void addRoom( String rname) {

 if ((nRoom >= 0) && (nRoom < 10)){

 room[nRoom] = new Room();

 room[nRoom].setName(rname);

 nRoom++;

 }

 }

public void setRoom (int i, String rname) {

 if (i < 10) room[i].setName(rname);

 }

 public void display() {

 System.out.println("Building : " + buildingId + ' ' + buildingName);

for (int i=0;i<nRoom;i++)

 System.out.println("room " + (i+1) + " " + room[i].getName());

 System.out.println("\*\*\*\*\*\*\*\*\*");

 }

} //end class Building

class Faculty {

 private int fid; //รหัสคณะ

 private String fname; //ชื่อคณะ

 private Building[] bdl = new Building[10]; //ตึกในคณะ

 private int nBdl; //จำนวนตึก

 Faculty(int id, String nameFac){ //constructor

 fid=id;

 fname=nameFac;

 nBdl=0;

 }

 void addBuilding(Building bdobj){

 if (nBdl < 10) bdl[nBdl++] = bdobj;

 }

 void display(){

 System.out.println("===================================");

 System.out.println("in Faculty Reports : " + fid + ' ' + fname);

 System.out.println("===================================");

 for (int i=0;i<nBdl;i++)

 bdl[i].display();

 System.out.println("===================================");

 }

 } //end class Faculty

public class JavaApp {

 public static void main(String[] args) {

 Building b1= new Building();

 b1.setId(1);

 b1.setName("Computer Science");

 b1.addRoom("CSB101");

 b1.addRoom("CSB201");

 b1.addRoom("CSB209");

 b1.display();

 Building b2= new Building(2,"Biology");

 Faculty f1;

 f1 = new Faculty(5,"SCIENCE");

 f1.addBuilding(b1);

 f1.addBuilding(b2);

 f1.display();

 b1.setRoom(0,"CSB100"); //edit room name from CSB101 to CSB100

 b2.addRoom("BB111");

 b2.addRoom("BB222");

 b2.addRoom("BB333");

 f1.display();

 }

}

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Building : 1 Computer Science

room 1 CSB101

room 2 CSB201

room 3 CSB209

\*\*\*\*\*\*\*\*\*

===================================

in Faculty Reports : 5 SCIENCE

===================================

Building : 1 Computer Science

room 1 CSB101

room 2 CSB201

room 3 CSB209

\*\*\*\*\*\*\*\*\*

Building : 2 Biology

\*\*\*\*\*\*\*\*\*

===================================

===================================

in Faculty Reports : 5 SCIENCE

===================================

Building : 1 Computer Science

room 1 CSB100

room 2 CSB201

room 3 CSB209

\*\*\*\*\*\*\*\*\*

Building : 2 Biology

room 1 BB111

room 2 BB222

room 3 BB333

\*\*\*\*\*\*\*\*\*

===================================

**//ตัวอย่างที่ 3//Implementation of Association : Course-Room Example**

class Course {

 private int code; //รหัสกระบวนวิชา

 private String courseName; //ชื่อกระบวนวิชา

 private Room objRoom; //ห้องที่ใช้

 public Course(){}; //constructor 1

 public Course (int c, String n ) { //constructor 2

 code=c;

 courseName=n;

Room

Course

 objRoom= new Room();

 objRoom = null;

 }

 public String getCourseName() {return courseName;}

void bookRoom(Room r){ //จองห้อง

 if (objRoom != null)

 objRoom.unbookCourse();

 objRoom = r;

}

 void unbookRoom(){ //ยกเลิกการจองห้อง

 objRoom = null;

}

void display() { //prototype

 System.out.print(objRoom != null? objRoom.getName(): "\*\*\*\*\*\*");

 System.out.println(" " + code + ' ' + courseName);

 }

} //end class Course

class Room{

 private String rname; //ชื่อห้อง

 private Course objCourse ; //วิชาที่มาใช้ห้อง

 public Room( String n){ //constructor

 rname = n;

 objCourse = new Course();

 objCourse = null;

 }

 Room() { } //constructor

String getName(){return rname;}

 void setName( String n) { rname = n;}

void bookCourse(Course c){

if (objCourse != null)

 objCourse.unbookRoom();

 objCourse = c;

}

void unbookCourse () { objCourse = null;};

void display(){

 System.out.println(rname + " " + (objCourse != null ? objCourse.getCourseName () :

"available") );

 }

 } //end class Room

public class JavaApp {

 public static void booking(Course c, Room r){

 c.bookRoom(r);

 r.bookCourse(c);

 }

public static void main(String[] args) {

 Room r100=new Room("CSB100");

 Room r308=new Room("CSB308");

 Room r207=new Room("CSB207");

 Course c101=new Course(101,"Intro to Computer" );

 Course c211=new Course(211,"OO Programming");

 Course c333=new Course(333,"Internet Application Development");

 c101.display(); //not assigned room

 c211.display(); //not assigned room

 c333.display(); //not assigned room

 r100.display(); //not assigned course

 r207.display(); //not assigned course

 r308.display(); //not assigned course

 System.out.println(" -------------------------------------- ");

booking(c101, r100);

 booking(c211, r207);

 c101.display();

 c211.display();

 c333.display(); //still not assigned room yet

 r100.display();

 r207.display();

 r308.display(); //still not assigned course yet

 System.out.println(" -------------------------------------- " );

 booking(c333, r207); //r207 changes course from c211 to c333

 booking(c333, r308); //c333 changes room from r207 to r308

 c101.display();

 c211.display();

 c333.display();

 r100.display();

 r207.display();

 r308.display();

 }

}

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\*\*\*\*\*\* 101 Intro to Computer

\*\*\*\*\*\* 211 OO Programming

\*\*\*\*\*\* 333 Internet Application Development

CSB100 available

CSB207 available

CSB308 available

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CSB100 101 Intro to Computer

CSB207 211 OO Programming

\*\*\*\*\*\* 333 Internet Application Development

CSB100 Intro to Computer

CSB207 OO Programming

CSB308 available

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CSB100 101 Intro to Computer

\*\*\*\*\*\* 211 OO Programming

CSB308 333 Internet Application Development

CSB100 Intro to Computer

CSB207 available

CSB308 Internet Application Development