

A01.java

```
package j2.exam01;
```

```
public class A01 {  
    private String name;  
    private int x;  
    private int y;  
    private int z;
```

(1)

(2)

(3)

```
// 次ページに続く
```

(4)

}

A01User.java

```
package j2.exam01;

public class A01User {
    public static void main(String[] args){
        A01 a = new A01("First");
        A01 b = new A01("Second", 100, 90, 80);

        System.out.println("a->name = " + a.getName());
        System.out.println("a->x = " + a.getX());
        System.out.println("a->y = " + a.getY());
        System.out.println("a->z = " + a.getZ());
        System.out.println("a->average = " + a.getAverage());

        System.out.println("b->name = " + b.getName());
        System.out.println("b->x = " + b.getX());
        System.out.println("b->y = " + b.getY());
        System.out.println("b->z = " + b.getZ());
        System.out.println("b->average = " + b.getAverage());
    }
}
```

A02.java

```
package j2.exam01;

public class A02 {
    // Protected fields can be accessed by subclasses
    protected String name;
    protected int[] xs;
    protected double average;
    private boolean updated;

    public A02(String name){
        this.name = name;
        this.xs = new int[]{0};
        this.updated = true;
    }
}
```

(1)

(2)

```
public String getName(){
    return this.name;
}

public int[] getXs(){
    return this.xs;
}

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```

(3)

}

A02User.java

```
package j2.exam01;

public class A02User {
    public static void main(String[] args) {
        int[] xs = new int[100];
        for(int i=0; i<100; i++)
            xs[i] = i;

        A02 a = new A02("First");
        a.setXs(xs);
        System.out.println(a.getName()+ ": " + a.getAverage());

        int[] ys = new int[10];
        for(int i=0; i<10; i++)
            ys[i] = i*i;

        A02 b = new A02("Second", ys);
        System.out.println(b.getName() + ": " + b.getAverage());
    }
}
```

A03.java

```
package j2.exam01;

public class _____{
    public A03(String name){ super(name); }

    public A03(String name, int[] xs){ super(name, xs); }

    _____ getSD(){
        _____
        _____
        _____Math.sqrt(_____)____
    }

    _____ getSumOfSquares(){
        _____
        _____
        _____
        _____
    }
}
```

A03User.java

```
package j2.exam01;

public class A03User {
    public static void main(String[] args) {
        int[] xs = new int[100];
        for(int i=0; i<100; i++)
            xs[i] = i;

        A03 a = new A03("First", xs);
        System.out.println(a.getName() + ": " + a.getSD());

        int [] ys = new int[10];
        for(int i=0; i<10; i++){
            ys[i] = i*i;
        }

        A03 b = new A03("Second", ys);
        System.out.println(b.getName() + ": " + b.getSD());
    }
}
```

A04.java

```
package j2.exam01;

public abstract class A04 {
    protected int serialNo;

    public A04() {
        super();
        this.serialNo = 1000;
    }

    public void setSerialNo(int initNo){
        this.serialNo = initNo;
    }

    (1)

    protected void printSeparator() {
        System.out.println("-----");
    }

    protected void printSerial() {
        System.out.println("> NO." + this.serialNo);
        this.serialNo++;
    }

    protected abstract void printHeader();
    protected abstract void printTrailer();
}
```

A041.java

```
package j2.exam01;
```

(2)

A042.java

```
package j2.exam01;
```

(3)



A04User.java

```
package j2.exam01;

public class A04User {
    public static void main(String[] args) {
        A04 ticketGenerator;

        // 1000 番で始まる Graduation Ceremony の入場券を 10 枚印刷する
        ticketGenerator = new A041();
        ticketGenerator.doPrint(10);

        // 100 番で始まる New Year Party の入場券を 15 枚印刷する
        ticketGenerator = new A042();
        ticketGenerator.setSerialNo(100);
        ticketGenerator.doPrint(15);
    }
}
```

Course.java

```
package j2.exam01;
import java.util.*;

public class Course {
    private String courseName;
    private LinkedList<Student> students
        = new LinkedList<Student>();

    public Course(String courseName){
        this.courseName = courseName;
    }

    public void addStudent(Student student){
        students.add(student);
    }

    public boolean removeStudent(Student student){
        return students.remove(student);
    }

    public String getCourseName(){
        return courseName;
    }

    public Iterator<Student> getStudents(){
        return students.iterator();
    }
}
```

Student.java

```
package j2.exam01;
import java.util.*;

public class Student {
    int idNumber;
    String name;

    LinkedList<Course> myCourses = new LinkedList<Course>();

    public Student(int idNumber, String name){
        this.idNumber = idNumber;
        this.name = name;
    }

    public void addCourse(Course course){
        myCourses.add(course);
        course.addStudent(this);
    }

    public String getName(){
        return this.name;
    }

    public int getIdNumber(){
        return this.idNumber;
    }

    public Iterator<Course> getCourses(){
        return myCourses.iterator();
    }
}
```

RegistrationDriver.java

```
package j2.exam01;
import java.util.*;

public class RegistrationDriver {
    public static void main(String[] args) {
        Course compiler = new Course("Compiler Theory");
        Course database = new Course("Database Management Systems");
        Course os = new Course("Operating Systems");
        Course architecture = new Course("Computer Architecture");

        Student taro = new Student(1, "Yamada Taro");
        Student hanako = new Student(2, "Hosei Hanako");
        Student jiro = new Student(3, "Koganei Jiro");
        Student sakura = new Student(4, "Ichigaya Sakura");

        // registration
        taro.addCourse(compiler);
        taro.addCourse(database);
        taro.addCourse(os);

        hanako.addCourse(compiler);
        hanako.addCourse(database);
        hanako.addCourse(os);
        hanako.addCourse(architecture);

        jiro.addCourse(database);
        jiro.addCourse(os);
        jiro.addCourse(architecture);

        sakura.addCourse(compiler);
        sakura.addCourse(os);

        // 次ページに続く
    }
}
```

```
Iterator<Student> it_students = os.getStudents();
while(it_students.hasNext()){
    Student st = it_students.next();
    System.out.println(st.getIdNumber()+ ": " + st.getName());
}

//
Iterator<Course> it_courses = jiro.getCourses();
while(it_courses.hasNext()){
    System.out.println(it_courses.next().getCourseName());
}
}
```