

```
import java.io.*;

public class Student implements Serializable {
    private String id;
    private String name;
    private char grade;

    public Student () {
        id = "";
        name = "";
        grade = ' ';
    }

    public Student(String id, String name, char grade) {
        this.id = id;
        this.name = name;
        this.grade = grade;
    }

    public String getId () {
        return id;
    }

    public void setId(String id) {
        this.id = id;
    }

    public String getName () {
        return name;
    }

    public void setName(String name) {
        this.name = name;
    }

    public char getGrade () {
        return grade;
    }

    public void setGrade(char grade) {
        this.grade = grade;
    }
}
```

```
import java.io.*;

public class Course implements Serializable {
    private Student [] ArrStudents;
    private int NbStudents;

    public Course () {
        ArrStudents = new Student [50];
        NbStudents = 0;
    }

    public boolean SearchStudent (String id) {
        for(int i = 0; i < NbStudents; i++) {
            if(ArrStudents[i].getId().equals(id)) {
                return true;
            }
        }

        return false;
    }

    public int NPassStudents () {
        int count = 0;

        for(int i = 0; i < NbStudents; i++) {
            if(ArrStudents[i].getGrade () != 'F' && ArrStudents[i].getGrade () != 'f') {
                count++;
            }
        }

        return count;
    }

    public void AddStudent (Student s) {
        if(NbStudents < ArrStudents.length) {
            ArrStudents[NbStudents] = s;
            NbStudents++;
        }
    }

    public void DelStudent (String id) {
        int index = -1;

        for(int i = 0; i < NbStudents; i++) {
            if(ArrStudents[i].getId().equals(id)) {
                index = i;
                break;
            }
        }

        if(index > -1) {
            ArrStudents[index] = ArrStudents[NbStudents - 1];
            ArrStudents[NbStudents - 1] = null;
        }
    }
}
```

```
NbStudents--;
```

```
}
```

```
}
```

```
public void DisplayStudents () {
```

```
    for(int i = 0; i < NbStudents; i++) {
```

```
        System.out.println("Student ID: " + ArrStudents[i].getId());
```

```
    }
```

```
}
```

```
}
```

```
import java.util.Scanner;
import java.io.*;

public class TestCourse {
    public static void main(String[] args) throws Exception {

        Course c = new Course();

        Scanner input = new Scanner(System.in);
        int choice;

        System.out.println("");
        System.out.println("                *** IMPORTANT NOTE ***");
        System.out.println(" You must save some data at least once before you can load it.");
        System.out.println(" If you try to load without saving at least once you will get an
error.");
        System.out.println(" This is because you are trying to load a file that doesn't exist."
);

        System.out.println(" For successful testing, follow these steps:");
        System.out.println(" - Add/Delete/Search/Display students");
        System.out.println(" - Save");
        System.out.println(" - Exit");
        System.out.println(" - Run the program again");
        System.out.println(" - Load");
        System.out.println(" - Now you can Add/Delete/Search/Display the students");
        System.out.println(" Have fun!");
        System.out.println("");

        do {
            System.out.println("-----");
            System.out.println("1- Load from file");
            System.out.println("2- Save to file");
            System.out.println("3- Add new student");
            System.out.println("4- Delete student");
            System.out.println("5- Search for a student");
            System.out.println("6- Get number of passed students");
            System.out.println("7- Display students");
            System.out.println("8- Exit");

            System.out.println("-----");
            System.out.print("Enter your choice: ");

            choice = input.nextInt();

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

            switch(choice)
            {
                case 1:
                    File ifile = new File("course.data");
                    FileInputStream fis = new FileInputStream(ifile);
                    ObjectInputStream ois = new ObjectInputStream(fis);
```

```
c = (Course)ois.readObject ();

ois.close ();

System.out.println("Done!");
break;

case 2:
File ofile = new File("course.data");
FileOutputStream fos = new FileOutputStream(ofile);
ObjectOutputStream oos = new ObjectOutputStream(fos);

oos.writeObject(c);

oos.close ();

System.out.println("Done!");
break;

case 3:
System.out.print("ID: ");
String id = input.next ();

System.out.print("Name: ");
String name = input.next ();

System.out.print("Grade: ");
char grade = input.next ().charAt (0);

Student s = new Student(id, name, grade);

c.AddStudent (s);
break;

case 4:
System.out.print("ID: ");
String delId = input.next ();

c.DelStudent (delId);
break;

case 5:
System.out.print("ID: ");
String searchId = input.next ();

boolean found = c.SearchStudent (searchId);

if(found == true)
    System.out.println("The student is found");
else
    System.out.println("The student is not found");
break;

case 6:
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int nPass = c.NPassStudents ();
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System.out.println("Number of passed students: " + nPass);
```

```
break;
```

```
case 7:
```

```
c.DisplayStudents ();
```

```
break;
```

```
}
```

```
} while(choice != 8);
```

```
System.out.println("Bye!");
```

```
}
```

```
}
```