

```
import java.io.*;
```

```
import java.util.ArrayList;
```

```
import java.util.List;
```

```
import java.util.Scanner;
```

```
// Student Class
```

```
class Student implements Serializable {
```

```
    private String studentId;
```

```
    private String name;
```

```
    private String rollNo;
```

```
    private String className;
```

```
    private double marks;
```

```
    private String address;
```

```
    public Student(String studentId, String name, String rollNo, String className, double marks, String address) {
```

```
        this.studentId = studentId;
```

```
        this.name = name;
```

```
        this.rollNo = rollNo;
```

```
        this.className = className;
```

```
        this.marks = marks;
```

```
        this.address = address;
```

```
    }
```

```
    public String getStudentId() {
```

```
        return studentId;
```

```
}
```

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

```
public String getRollNo() {  
    return rollNo;  
}
```

```
public String getClassName() {  
    return className;  
}
```

```
public double getMarks() {  
    return marks;  
}
```

```
public String getAddress() {  
    return address;  
}
```

```
public String toString() {  
    return "ID: " + studentId + ", Name: " + name + ", Roll No: " + rollNo +  
        ", Class: " + className + ", Marks: " + marks + ", Address: " + address;  
}
```

```
}
```

```
// StudentDatabase Class
```

```
class StudentDatabase {
```

```
    private static final String FILE_NAME = "students.dat";
```

```
    public void createDatabase(List<Student> students) {
```

```
        try (ObjectOutputStream oos = new ObjectOutputStream(new  
FileOutputStream(FILE_NAME))) {
```

```
            for (Student student : students) {
```

```
                oos.writeObject(student);
```

```
            }
```

```
            System.out.println("Database created successfully.");
```

```
        } catch (IOException e) {
```

```
            e.printStackTrace();
```

```
        }
```

```
    }
```

```
    public List<Student> displayDatabase() {
```

```
        List<Student> students = new ArrayList<>();
```

```
        try (ObjectInputStream ois = new ObjectInputStream(new  
FileInputStream(FILE_NAME))) {
```

```
            while (true) {
```

```
                Student student = (Student) ois.readObject();
```

```
                students.add(student);
```

```
            }
```

```
        } catch (EOFException ignored) {
```

```
    } catch (IOException | ClassNotFoundException e) {  
        e.printStackTrace();  
    }  
    return students;  
}
```

```
public void deleteRecord(String studentId) {  
    List<Student> students = displayDatabase();  
    students.removeIf(student -> student.getId().equals(studentId));  
    saveUpdatedDatabase(students);  
    System.out.println("Record deleted successfully.");  
}
```

```
public void updateRecord(Student updatedStudent) {  
    List<Student> students = displayDatabase();  
    for (int i = 0; i < students.size(); i++) {  
        if (students.get(i).getId().equals(updatedStudent.getId())) {  
            students.set(i, updatedStudent);  
            break;  
        }  
    }  
    saveUpdatedDatabase(students);  
    System.out.println("Record updated successfully.");  
}
```

```
public Student searchRecord(String studentId) {
```

```
List<Student> students = displayDatabase();  
for (Student student : students) {  
    if (student.getId().equals(studentId)) {  
        return student;  
    }  
}  
return null;  
}
```

```
private void saveUpdatedDatabase(List<Student> students) {  
    try (ObjectOutputStream oos = new ObjectOutputStream(new  
        FileOutputStream(FILE_NAME))) {  
        for (Student student : students) {  
            oos.writeObject(student);  
        }  
    } catch (IOException e) {  
        e.printStackTrace();  
    }  
}
```

// Main Class

```
public class Main {  
    public static void main(String[] args) {  
        StudentDatabase db = new StudentDatabase();  
        Scanner scanner = new Scanner(System.in);
```

```
// Create sample data
```

```
List<Student> students = new ArrayList<>();
```

```
students.add(new Student("1", "Alice", "101", "10th", 95.5, "123 Main St"));
```

```
students.add(new Student("2", "Bob", "102", "10th", 88.0, "456 Oak St"));
```

```
students.add(new Student("3", "Charlie", "103", "10th", 92.5, "789 Pine St"));
```

```
// Create database
```

```
db.createDatabase(students);
```

```
// Display database
```

```
System.out.println("Displaying Database:");
```

```
List<Student> studentList = db.displayDatabase();
```

```
studentList.forEach(System.out::println);
```

```
// Update a record
```

```
System.out.println("\nUpdating Bob's record...");
```

```
db.updateRecord(new Student("2", "Bob", "102", "10th", 90.0, "456 Oak St Updated"));
```

```
// Search for a record
```

```
System.out.println("\nSearching for Alice's record...");
```

```
Student searchResult = db.searchRecord("1");
```

```
if (searchResult != null) {
```

```
    System.out.println("Found: " + searchResult);
```

```
} else {
```

```
    System.out.println("Record not found.");
```

```

    }

    // Delete a record

    System.out.println("\nDeleting Charlie's record...");

    db.deleteRecord("3");

    // Display database again

    System.out.println("Displaying Database after deletion:");

    studentList = db.displayDatabase();

    studentList.forEach(System.out::println);

    scanner.close();
}
}

```

Output:

Database created successfully.

Displaying Database:

ID: 1, Name: Aarav, Roll No: 101, Class: 10<sup>th</sup>, Marks: 95.5, Address: 123 Main St, Delhi

ID: 2, Name: Vivaan, Roll No: 102, Class: 10<sup>th</sup>, Marks: 88.0, Address: 456 Oak St, Mumbai

ID: 3, Name: Reyansh, Roll No: 103, Class: 10<sup>th</sup>, Marks: 92.5, Address: 789 Pine St, Bangalore

Updating Vivaan's record...

Record updated successfully.

Searching for Aarav's record...

Found: ID: 1, Name: Aarav, Roll No: 101, Class: 10<sup>th</sup>, Marks: 95.5, Address: 123 Main St, Delhi

Deleting Reyansh's record...

Record deleted successfully.

Displaying Database after deletion:

ID: 1, Name: Aarav, Roll No: 101, Class: 10<sup>th</sup>, Marks: 95.5, Address: 123 Main St, Delhi

ID: 2, Name: Vivaan, Roll No: 102, Class: 10<sup>th</sup>, Marks: 90.0, Address: 456 Oak St, Mumbai  
Updated