Java Programs: Serialization & Employee Management

1. Student Serialization and Deserialization

```
import java.io.*;

class Student implements Serializable {
    private static final long serialVersionUID = 1L;
    int id;
    String name;
    double gpa;

    public Student(int id, String name, double gpa) {
        this.id = id;
        this.name = name;
        this.gpa = gpa;
    }

    public void display() {
        System.out.println("ID: " + id + ", Name: " + name + ", GPA: " + gpa);
    }
}

public class StudentSerialization {
    private static final String FILE_NAME = "student.ser";

    public static void serializeStudent(Student student) {
        try (ObjectOutputStream oos = new ObjectOutputStream(new FileOutputStream(FILE_NAME))) {
            oos.writeObject(student);
            System.out.println("Student object serialized successfully.");
        } catch (IOException e) {
            System.out.println("IOException occurred: " + e.getMessage());
        }
    }

    public static Student deserializeStudent() {
        try (ObjectInputStream ois = new ObjectInputStream(new FileInputStream(FILE_NAME))) {
            return (Student) ois.readObject();
        } catch (FileNotFoundException e) {
            System.out.println("File not found: " + e.getMessage());
        } catch (IOException e) {
            System.out.println("IOException occurred: " + e.getMessage());
        } catch (ClassNotFoundException e) {
            System.out.println("Class not found: " + e.getMessage());
        }
        return null;
    }

    public static void main(String[] args) {
        Student student = new Student(101, "John Doe", 3.8);
        serializeStudent(student);

        Student deserializedStudent = deserializeStudent();
        if (deserializedStudent != null) {
            deserializedStudent.display();
        }
    }
}
```

2. Menu-Based Employee Management

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

```
class Employee implements Serializable {
    private static final long serialVersionUID = 1L;
    int empId;
    String name;
    String designation;
    double salary;

    public Employee(int empId, String name, String designation, double salary) {
        this.empId = empId;
        this.name = name;
        this.designation = designation;
        this.salary = salary;
    }

    public void display() {
        System.out.println("ID: " + empId + ", Name: " + name + ", Designation: " + designation + ", Salary: "
+ salary);
    }
}

public class EmployeeManagement {
    private static final String FILE_NAME = "employees.dat";

    public static void addEmployee(Employee employee) {
        try (ObjectOutputStream oos = new ObjectOutputStream(new FileOutputStream(FILE_NAME, true))) {
            oos.writeObject(employee);
            System.out.println("Employee added successfully.");
        } catch (IOException e) {
            System.out.println("IOException: " + e.getMessage());
        }
    }

    public static void displayAllEmployees() {
        try (ObjectInputStream ois = new ObjectInputStream(new FileInputStream(FILE_NAME))) {
            while (true) {
                Employee employee = (Employee) ois.readObject();
                if (employee != null) {
                    employee.display();
                }
            }
        } catch (EOFException e) {
        } catch (FileNotFoundException e) {
            System.out.println("No employee records found.");
        } catch (IOException | ClassNotFoundException e) {
            System.out.println("Error: " + e.getMessage());
        }
    }

    public static void main(String[] args) {
        Scanner scanner = new Scanner(System.in);
        while (true) {
            System.out.println("\nMenu:\n1. Add Employee\n2. Display All Employees\n3. Exit");
            System.out.print("Choose an option: ");
            int choice = scanner.nextInt();

            switch (choice) {
                case 1:
                    System.out.print("Enter Employee ID: ");
                    int empId = scanner.nextInt();
                    scanner.nextLine();
                    System.out.print("Enter Name: ");
                    String name = scanner.nextLine();
                    System.out.print("Enter Designation: ");
                    String designation = scanner.nextLine();
                    System.out.print("Enter Salary: ");
                    double salary = scanner.nextDouble();
                    addEmployee(new Employee(empId, name, designation, salary));
                    break;
                case 2:
                    displayAllEmployees();
                    break;
                case 3:
                    System.out.println("Exiting...");
                    scanner.close();
                    return;
                default:
                    System.out.println("Invalid choice. Try again.");
            }
        }
    }
}
```