```java
import java.io.Serializable;
import java.util.ArrayList;
import java.util.List;
import java.util.Scanner;

class Student implements Serializable {
    private String name;
    private int rollNumber;
    private String grade;

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

    public String getName() {
        return name;
    }

    public int getRollNumber() {
        return rollNumber;
    }

    public String getGrade() {
        return grade;
    }

    @Override
    public String toString() {
        return "Name: " + name + "\nRoll Number: " + rollNumber + "\nGrade: "
+ grade;
    }
}

class StudentManagementSystem {
    private List<Student> students;

    public StudentManagementSystem() {
        students = new ArrayList<>();
    }

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

    public void removeStudent(Student student) {
        students.remove(student);
```

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    }

    public Student searchStudent(int rollNumber) {
        for (Student student : students) {
            if (student.getRollNumber() == rollNumber) {
                return student;
            }
        }
        return null;
    }

    public void displayAllStudents() {
        for (Student student : students) {
            System.out.println(student);
            System.out.println("--------------");
        }
    }
}

public class StudentManagementApp {
    public static void main(String[] args) {
        Scanner scanner = new Scanner(System.in);
        StudentManagementSystem studentSystem = new StudentManagementSystem();

        while (true) {
            System.out.println("1. Add Student");
            System.out.println("2. Remove Student");
            System.out.println("3. Search Student");
            System.out.println("4. Display All Students");
            System.out.println("5. Exit");
            System.out.print("Enter your choice: ");
            int choice = scanner.nextInt();
            scanner.nextLine(); // Consume the newline character

            switch (choice) {
                case 1:
                    System.out.print("Enter name: ");
                    String name = scanner.nextLine();
                    System.out.print("Enter roll number: ");
                    int rollNumber = readIntInput(scanner, "Enter a valid
integer for roll number: ");
                    System.out.print("Enter grade: ");
                    String grade = scanner.nextLine();
                    Student newStudent = new Student(name, rollNumber, grade);
                    studentSystem.addStudent(newStudent);
                    break;

                case 2:
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                        System.out.print("Enter the roll number of the student to
remove: ");
                        int rollNumberToRemove = readIntInput(scanner, "Enter a
valid integer for roll number: ");
                        Student student =
studentSystem.searchStudent(rollNumberToRemove);
                        if (student != null) {
                            studentSystem.removeStudent(student);
                            System.out.println("Student removed.");
                        } else {
                            System.out.println("Student not found.");
                        }
                        break;

                    case 3:
                        System.out.print("Enter the roll number of the student to
search for: ");
                        int rollNumberToSearch = readIntInput(scanner, "Enter a
valid integer for roll number: ");
                        Student foundStudent =
studentSystem.searchStudent(rollNumberToSearch);
                        if (foundStudent != null) {
                            System.out.println(foundStudent);
                        } else {
                            System.out.println("Student not found.");
                        }
                        break;

                    case 4:
                        studentSystem.displayAllStudents();
                        break;

                    case 5:
                        System.out.println("Exiting...");
                        System.exit(0);
                        break;

                    default:
                        System.out.println("Invalid choice. Please select a valid
option.");
                }
            }
        }

    private static int readIntInput(Scanner scanner, String errorMessage) {
        while (true) {
            try {
                return Integer.parseInt(scanner.nextLine());
```

```
        } catch (NumberFormatException e) {
            System.out.println(errorMessage);
        }
    }
  }
}
```

## Output

1. Add Student

2. Remove Student

3. Search Student

4. Display All Students

5. Exit

Enter your choice: