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Division:- A
Roll No.:- 27
Subject:- Java Programming Lab
Batch No.:- A2

Assignment No.3

Develop a program in Java to manage a university's faculty database.Design a base class named "Employee" with data members such as employee ID, name, and salary. Create derived classes named "Professor" and "Staff" inheriting from the Employee class. The Professor class should have additional data members such as department and research interests, while the Staff class should include details like designation and years of service. Implement methods to display the details of each employee type. Use polymorphism and exception handling concept in the program

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

class Student
{
   String name;
   String dateOfBirth;
   String bloodGroup;
   String contactAddress;

   public Student(String name, String dateOfBirth, String bloodGroup, String contactAddress)
{
      this.name = name;
      this.dateOfBirth = dateOfBirth;
      this.bloodGroup = bloodGroup;
      this.contactAddress = contactAddress;
   }
}

class PhysicalAttributes
{
   double height;
   double weight;

   public PhysicalAttributes(double height, double weight)
{
      this.height = height;
      this.weight = weight;
   }
}

class InsuranceInfo
{
```

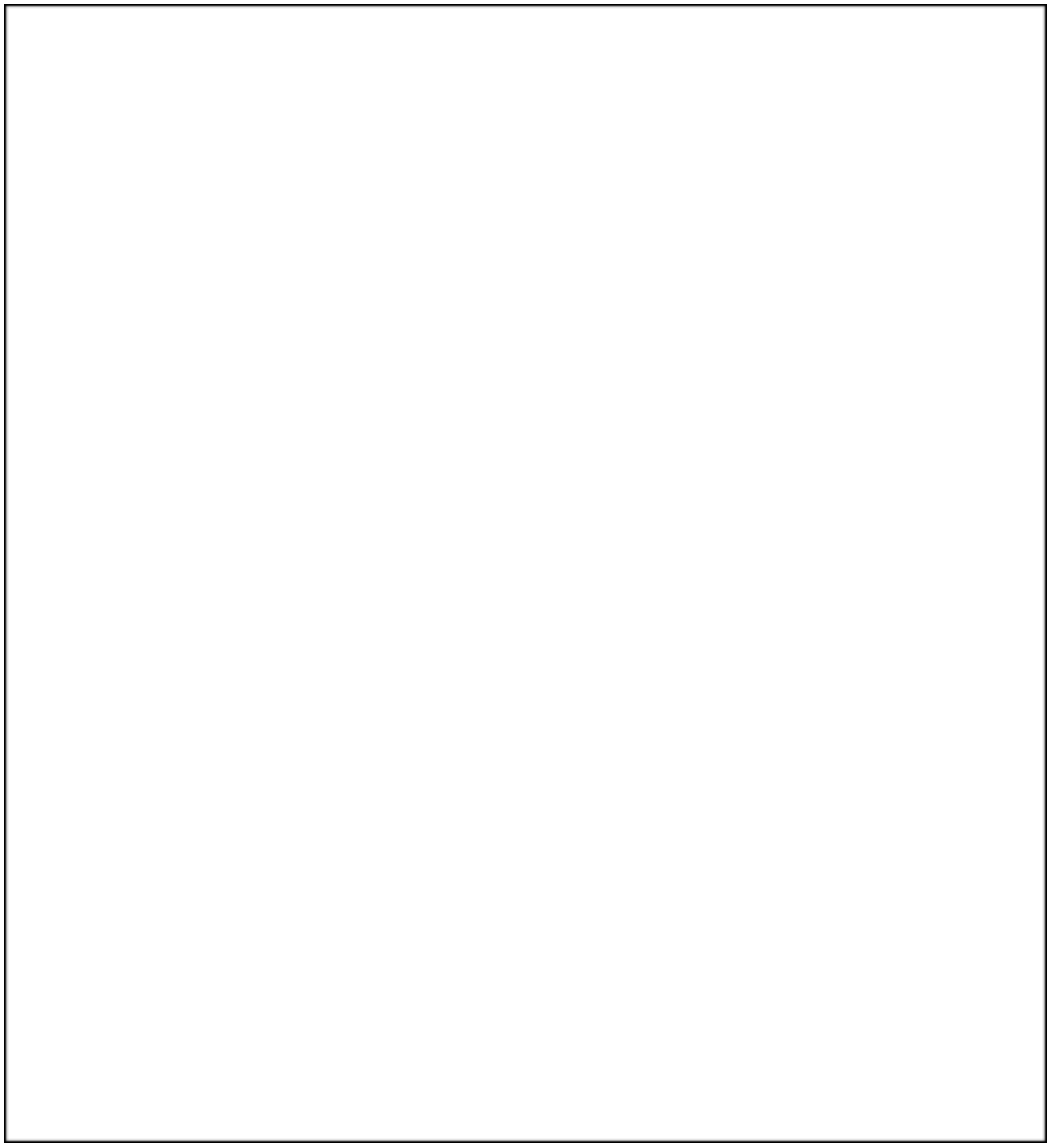
```
    String insurancePolicyNumber;

    public InsuranceInfo(String insurancePolicyNumber)
{
        this.insurancePolicyNumber = insurancePolicyNumber;
    }
}

class StudentRecord extends Student
{
    double height;
    double weight;
    String insurancePolicyNumber;
    String telephoneNumber;
    String drivingLicenseNumber;

    public StudentRecord(String name, String dateOfBirth, String bloodGroup, String contactAddress,
                         double height, double weight, String insurancePolicyNumber,
                         String telephoneNumber, String drivingLicenseNumber)
{
        super(name, dateOfBirth, bloodGroup, contactAddress);
        this.height = height;
        this.weight = weight;
        this.insurancePolicyNumber = insurancePolicyNumber;
        this.telephoneNumber = telephoneNumber;
        this.drivingLicenseNumber = drivingLicenseNumber;
    }

    @Override
    public String toString()
{
        return "Name: " + name + ", DOB: " + dateOfBirth + ", Blood Group: " + bloodGroup +
               ", Address: " + contactAddress + ", Height: " + height + " cm, Weight: " + weight +
               " kg, Insurance Policy: " + insurancePolicyNumber + ", Phone: " + telephoneNumber +
               ", Driving License: " + drivingLicenseNumber;
    }
}

public class Main
{
    private static final ArrayList<StudentRecord> records = new ArrayList<>();
    private static final Scanner scanner = new Scanner(System.in);

    public static void main(String[] args)
    {
        while (true)
{
            System.out.println("\n--- Student Database System ---");
```

```
        System.out.println("1. Build Master Table");
        System.out.println("2. Display Records");
        System.out.println("3. Insert New Entry");
        System.out.println("4. Delete Entry");
        System.out.println("5. Edit Record");
        System.out.println("6. Search Record");
        System.out.println("7. Exit");
        System.out.print("Enter your choice: ");
        int choice = scanner.nextInt();
        scanner.nextLine();
        switch (choice)
        {
           case 1 : buildMasterTable();
                    break;
           case 2 : displayRecords();
                    break;
           case 3 : insertNewEntry();
                    break;
           case 4 : deleteEntry();
                    break;
           case 5 : editRecord();
                    break;
           case 6 : searchRecord();
                    break;
           case 7 :
              {
              System.out.println("Exiting...");
              return;
              }
           default : System.out.println("Invalid choice. Please try again.");
        }
     }
}

private static void buildMasterTable()
{
   System.out.print("Enter the number of students to add: ");
   int n = scanner.nextInt();
   scanner.nextLine(); // Consume newline
   for (int i = 0; i < n; i++) {
      System.out.println("\nEnter details for student " + (i + 1) + ":");
      records.add(createStudentRecord());
   }
   System.out.println("Master table built successfully.");
}

private static void displayRecords()
{
```

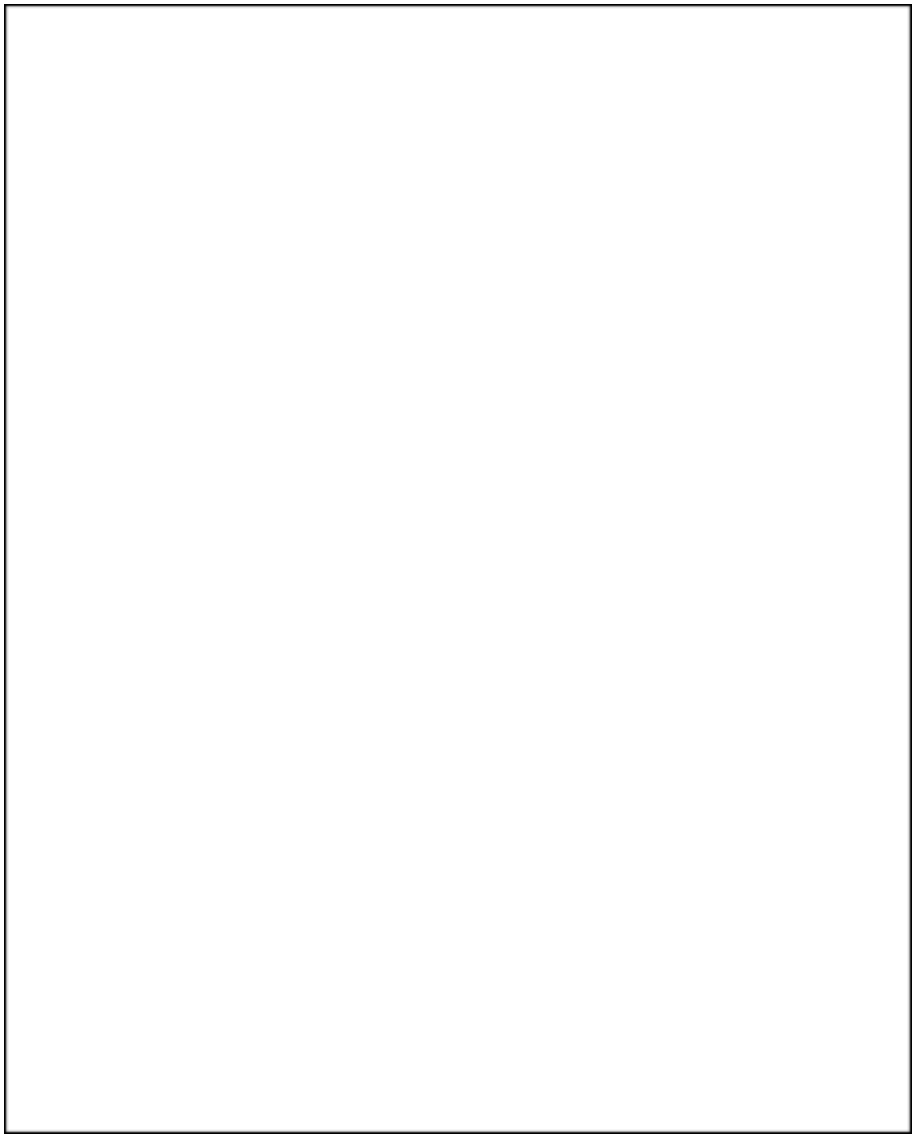
```
    if (records.isEmpty()) {
        System.out.println("No records to display.");
        return;
    }
    System.out.println("\n--- Student Records ---");
    for (StudentRecord record : records) {
        System.out.println(record);
    }
}

private static void insertNewEntry() {
    System.out.println("\nEnter details for the new student:");
    records.add(createStudentRecord());
    System.out.println("New entry added successfully.");
}

private static void deleteEntry() {
    System.out.print("Enter the name of the student to delete: ");
    String name = scanner.nextLine();
    records.removeIf(record -> record.name.equalsIgnoreCase(name));
    System.out.println("Entry deleted (if it existed).");
}

private static void editRecord() {
    System.out.print("Enter the name of the student to edit: ");
    String name = scanner.nextLine();
    for (StudentRecord record : records) {
        if (record.name.equalsIgnoreCase(name)) {
            System.out.println("Enter new details:");
            records.set(records.indexOf(record), createStudentRecord());
            System.out.println("Record updated successfully.");
            return;
        }
    }
    System.out.println("Student not found.");
}

private static void searchRecord() {
    System.out.print("Enter the name of the student to search: ");
    String name = scanner.nextLine();
    for (StudentRecord record : records) {
        if (record.name.equalsIgnoreCase(name)) {
            System.out.println("Record found:");
            System.out.println(record);
            return;
        }
    }
    System.out.println("Student not found.");
```

```
    }

    private static StudentRecord createStudentRecord() {
        System.out.print("\n Name: ");
        String name = scanner.nextLine();
        System.out.print("\n Date of Birth (DD/MM/YYYY): ");
        String dob = scanner.nextLine();
        System.out.print("\n Blood Group: ");
        String bloodGroup = scanner.nextLine();
        System.out.print("\n Contact Address: ");
        String address = scanner.nextLine();
        System.out.print("\n Height (cm): ");
        double height = scanner.nextDouble();
        System.out.print("\n Weight (kg): ");
        double weight = scanner.nextDouble();
        scanner.nextLine(); // Consume newline
        System.out.print("\n Insurance Policy Number: ");
        String policyNumber = scanner.nextLine();
        System.out.print("\n Telephone Number: ");
        String phone = scanner.nextLine();
        System.out.print("\n Driving License Number: ");
        String license = scanner.nextLine();

            return new StudentRecord(name, dob, bloodGroup, address, height, weight, policyNumber,
phone, license);
    }
}
```

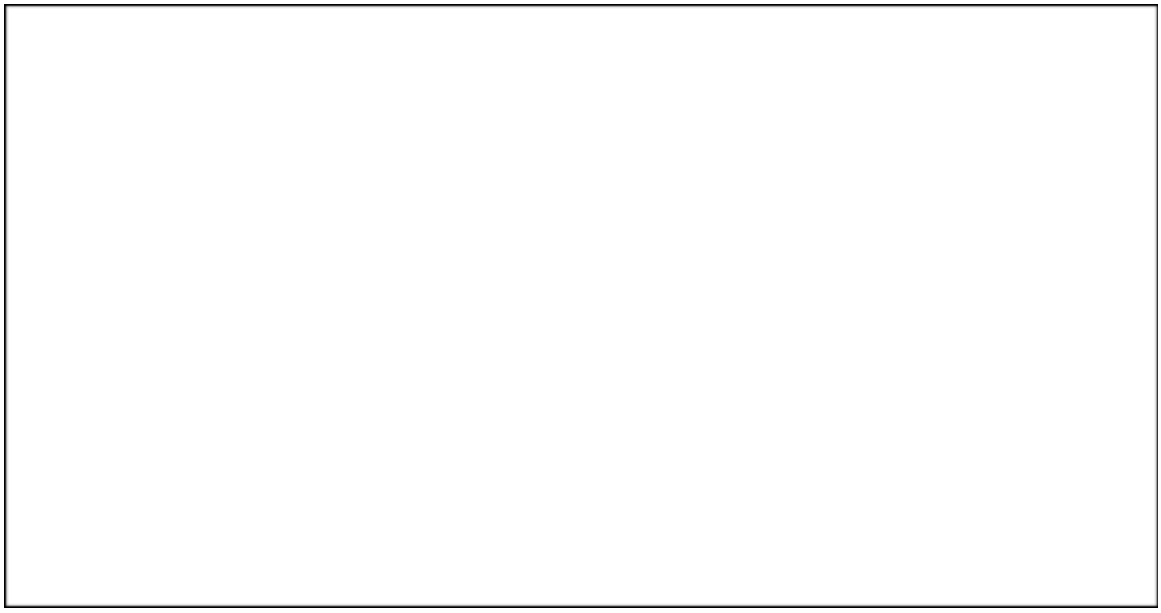
Output:-



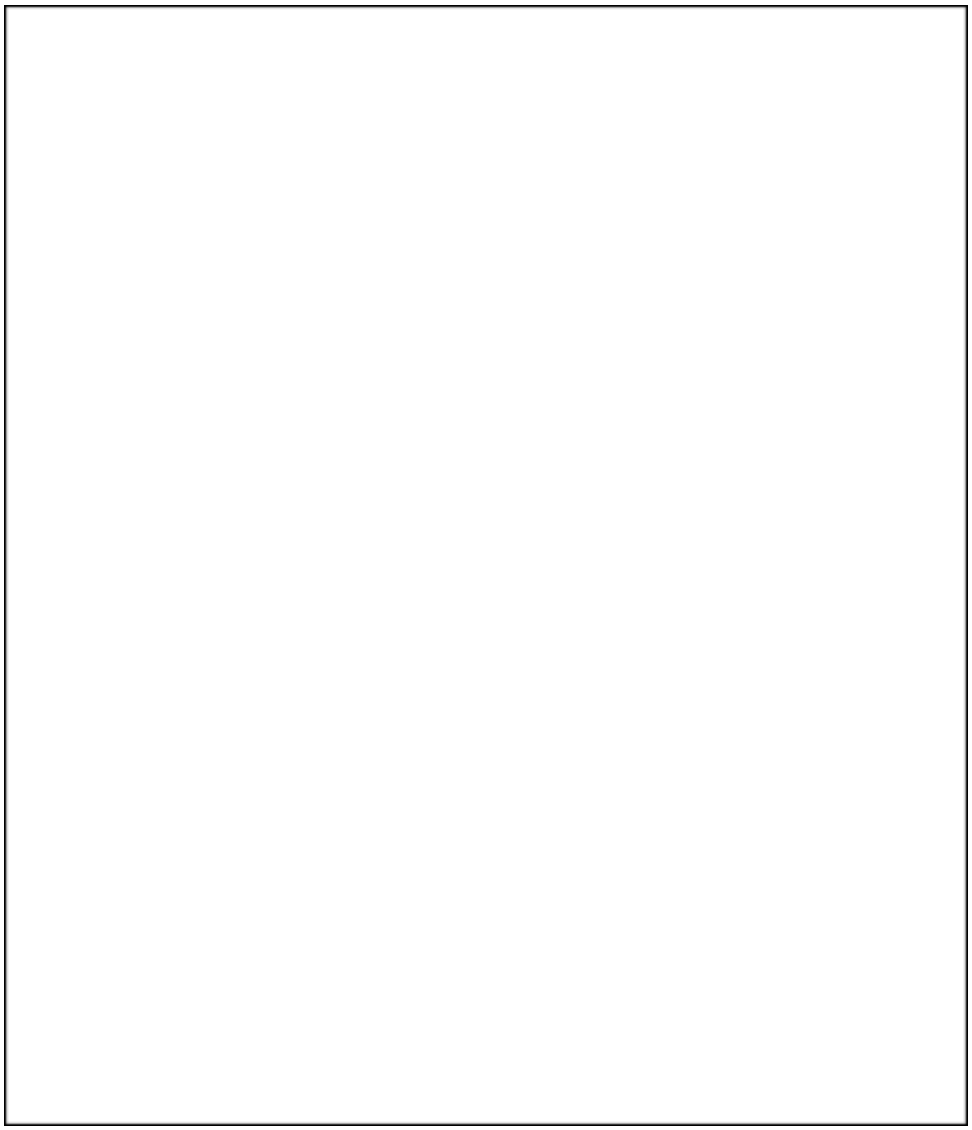
```
--- Student Database System ---
1. Build Master Table
2. Display Records
3. Insert New Entry
4. Delete Entry
5. Edit Record
6. Search Record
7. Exit
Enter your choice: 1
Enter the number of students to add: 2

Enter details for student 1:

 Name: Shruti

 Date of Birth (DD/MM/YYYY): 20/09/2005

 Blood Group: O+ve

 Contact Address: College Road, Nashik

 Height (cm): 165

 Weight (kg): 45

 Insurance Policy Number: 9685749685

 Telephone Number: 8596748574

 Driving License Number: 2222225555

Enter details for student 2:
```



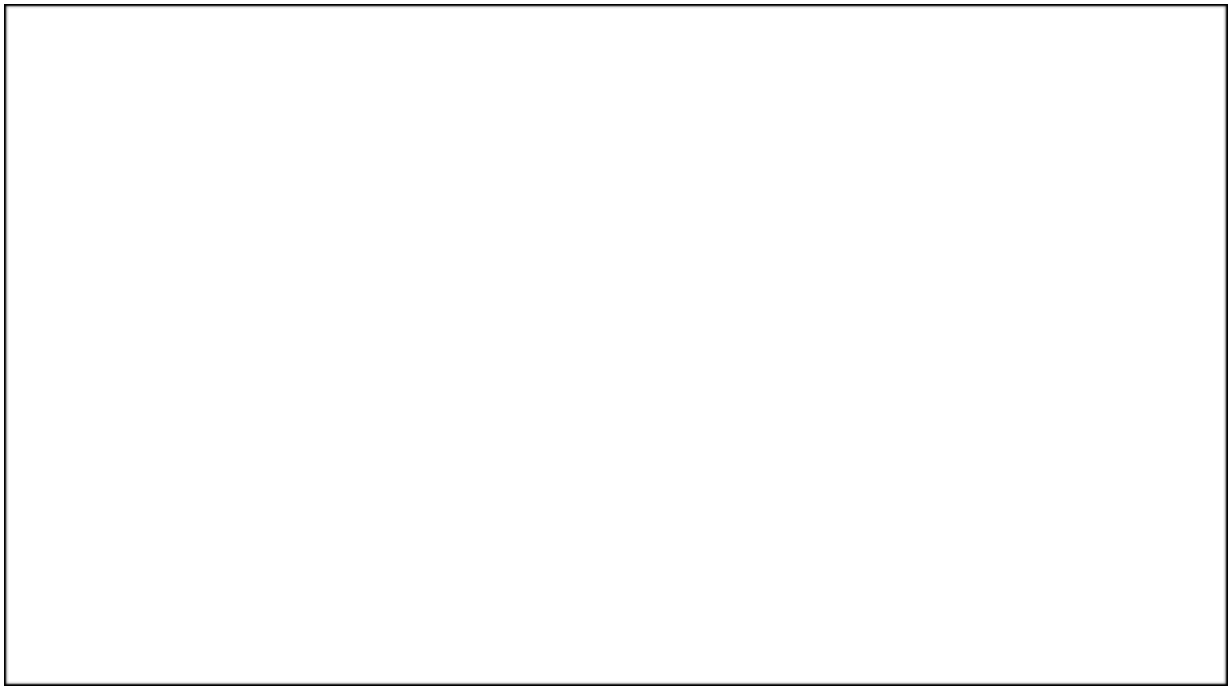
```
 Driving License Number: 2222225555

Enter details for student 2:

 Name: Aradhya

 Date of Birth (DD/MM/YYYY): 17/06/2002

 Blood Group: B+ve

 Contact Address: Panchvati, Nashik

 Height (cm): 162

 Weight (kg): 42

 Insurance Policy Number: 8574857485

 Telephone Number: 9685869685

 Driving License Number: 6688995588
Master table built successfully.

--- Student Database System ---
1. Build Master Table
2. Display Records
3. Insert New Entry
4. Delete Entry
5. Edit Record
6. Search Record
7. Exit
Enter your choice: 2
```



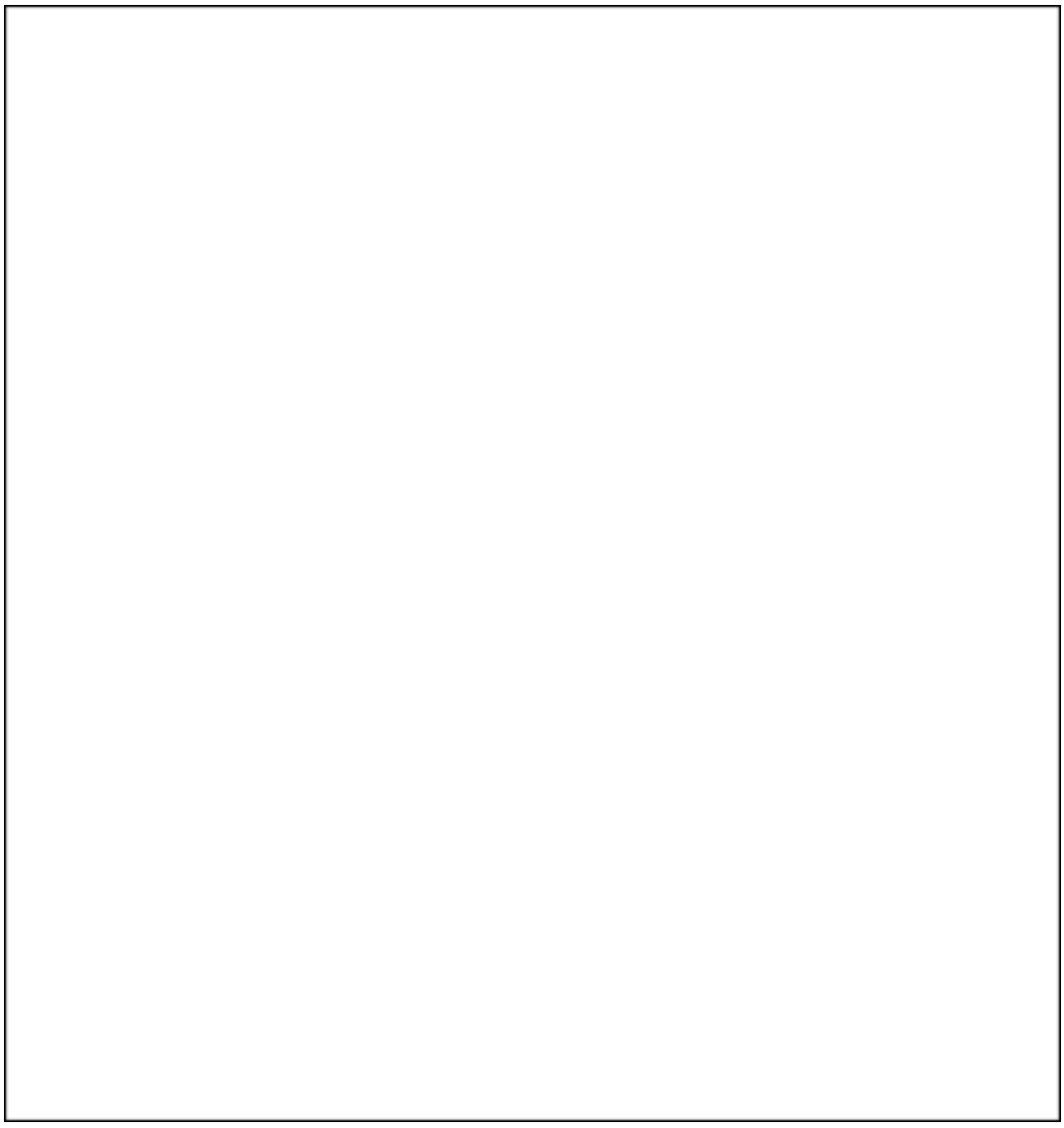
```
6. Search Record
7. Exit
Enter your choice: 2

--- Student Records ---
Name: Shruti, DOB: 20/09/2005, Blood Group: O+ve, Address: College Road, Nashik, Height: 165.0 cm, Weight: 45.0 kg, Ins
urance Policy: 9685749685, Phone: 8596748574, Driving License: 2222225555
Name: Aradhya, DOB: 17/06/2002, Blood Group: B+ve, Address: Panchvati, Nashik, Height: 162.0 cm, Weight: 42.0 kg, Insur
ance Policy: 8574857485, Phone: 9685869685, Driving License: 6688995588

--- Student Database System ---
1. Build Master Table
2. Display Records
3. Insert New Entry
4. Delete Entry
5. Edit Record
6. Search Record
7. Exit
Enter your choice: 3

Enter details for the new student:

 Name: Mitali

 Date of Birth (DD/MM/YYYY): 15/10/2003

 Blood Group: O+ve

 Contact Address: Indira Nagar, Nashik

 Height (cm): 166

 Weight (kg): 48
```



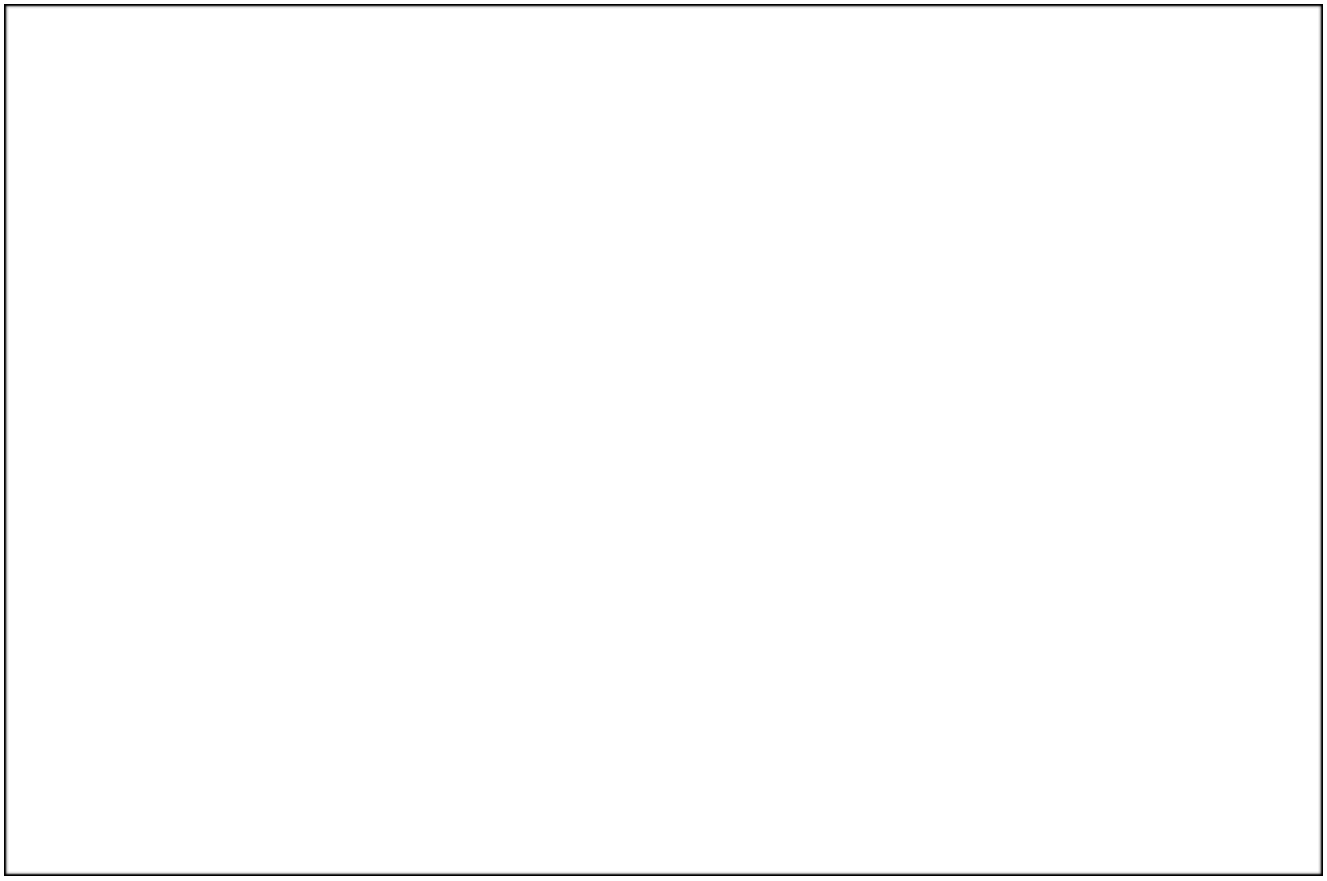
```
 Height (cm): 166

 Weight (kg): 48

 Insurance Policy Number: 9685748596

 Telephone Number: 36352826256

 Driving License Number: 4444555777
New entry added successfully.

--- Student Database System ---
1. Build Master Table
2. Display Records
3. Insert New Entry
4. Delete Entry
5. Edit Record
6. Search Record
7. Exit
Enter your choice: 4
Enter the name of the student to delete: Aradhya
Entry deleted (if it existed).

--- Student Database System ---
1. Build Master Table
2. Display Records
3. Insert New Entry
4. Delete Entry
5. Edit Record
6. Search Record
7. Exit
Enter your choice: 2
```



```
6. Search Record
7. Exit
Enter your choice: 2

--- Student Records ---
Name: Shruti, DOB: 20/09/2005, Blood Group: O+ve, Address: College Road, Nashik, Height: 165.0 cm, Weight: 45.0 kg, Ins
urance Policy: 9685749685, Phone: 8596748574, Driving License: 2222225555
Name: Mitali, DOB: 15/10/2003, Blood Group: O+ve, Address: Indira Nagar, Nashik, Height: 166.0 cm, Weight: 48.0 kg, Ins
urance Policy: 9685748596, Phone: 36352826256, Driving License: 4444555777

--- Student Database System ---
1. Build Master Table
2. Display Records
3. Insert New Entry
4. Delete Entry
5. Edit Record
6. Search Record
7. Exit
Enter your choice: 6
Enter the name of the student to search: Mitali
Record found:
Name: Mitali, DOB: 15/10/2003, Blood Group: O+ve, Address: Indira Nagar, Nashik, Height: 166.0 cm, Weight: 48.0 kg, Ins
urance Policy: 9685748596, Phone: 36352826256, Driving License: 4444555777

--- Student Database System ---
1. Build Master Table
2. Display Records
3. Insert New Entry
4. Delete Entry
5. Edit Record
6. Search Record
7. Exit
Enter your choice: 5
```



```
5. Edit Record
6. Search Record
7. Exit
Enter your choice: 5
Enter the name of the student to edit: Shruti
Enter new details:

 Name: Ruhi

 Date of Birth (DD/MM/YYYY): 20/11/2006

 Blood Group: B+ve

 Contact Address: Pune

 Height (cm): 163

 Weight (kg): 40

 Insurance Policy Number: 9685748596

 Telephone Number: 6598658965

 Driving License Number: 8888777744
Record updated successfully.

--- Student Database System ---
1. Build Master Table
2. Display Records
3. Insert New Entry
4. Delete Entry
5. Edit Record
6. Search Record
```



```
 Driving License Number: 8888777744
Record updated successfully.

--- Student Database System ---
1. Build Master Table
2. Display Records
3. Insert New Entry
4. Delete Entry
5. Edit Record
6. Search Record
7. Exit
Enter your choice: 2

--- Student Records ---
Name: Ruhi, DOB: 20/11/2006, Blood Group: B+ve, Address: Pune, Height: 163.0 cm, Weight: 40.0 kg, Insurance Policy: 968
5748596, Phone: 6598658965, Driving License: 8888777744
Name: Mitali, DOB: 15/10/2003, Blood Group: O+ve, Address: Indira Nagar, Nashik, Height: 166.0 cm, Weight: 48.0 kg, Ins
urance Policy: 9685748596, Phone: 36352826256, Driving License: 4444555777

--- Student Database System ---
1. Build Master Table
2. Display Records
3. Insert New Entry
4. Delete Entry
5. Edit Record
6. Search Record
7. Exit
Enter your choice: 7
Exiting...


...Program finished with exit code 0
Press ENTER to exit console.
```