NAME: BHUMIT TAWNAR
ROLL NO: 2401201029
COURSE: FUNDAMENTAL OF JAVA PROGRAMMING

LAB ASSIGNMENT -1

Code: (Person.java)

```java
public class Person {
    protected String name;

    public Person() {
        this.name = "";
    }

    public Person(String name) {
        this.name = name;
    }

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

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

Code: (Student.java)

```java
// Student.java
public class Student extends Person {
    private int rollNo;
    private String course;
    private double marks;
    private char grade;

    public Student() {
        super();
    }

    public Student(int rollNo, String name, String course, double marks) {
        super(name);
```

```java
        this.rollNo = rollNo;
        this.course = course;
        this.marks = marks;
        calculateGrade();
    }

    public void calculateGrade() {
        if (marks >= 90) grade = 'A';
        else if (marks >= 75) grade = 'B';
        else if (marks >= 60) grade = 'C';
        else if (marks >= 40) grade = 'D';
        else grade = 'F';
    }

    public void displayDetails() {
        System.out.println("Roll No: " + rollNo);
        System.out.println("Name    : " + name);
        System.out.println("Course : " + course);
        System.out.println("Marks   : " + marks);
        System.out.println("Grade   : " + grade);
        System.out.println("--------------------------------");
    }

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

Code: (StudentRecordApp.java)

```java
// StudentRecordApp.java
import java.util.*;

public class StudentRecordApp {
    private static ArrayList<Student> students = new ArrayList<>();
    private static Scanner sc = new Scanner(System.in);

    public static void main(String[] args) {
        int choice = 0;
        do {
            System.out.println("\n===== Student Record Menu =====");
            System.out.println("1. Add Student");
            System.out.println("2. Display All Students");
            System.out.println("3. Exit");
```

```java
            System.out.print("Enter your choice: ");

            try {
                choice = Integer.parseInt(sc.nextLine().trim());
            } catch (NumberFormatException e) {
                System.out.println("Invalid input! Enter a number 1-3.");
                continue;
            }

            switch (choice) {
                case 1:
                    addStudent();
                    break;
                case 2:
                    displayAllStudents();
                    break;
                case 3:
                    System.out.println("Exiting the application. Goodbye!");
                    break;
                default:
                    System.out.println("Please enter a valid choice (1-3).");
            }

        } while (choice != 3);
    }

    private static void addStudent() {
        try {
            System.out.print("Enter Roll No: ");
            int roll = Integer.parseInt(sc.nextLine().trim());

            System.out.print("Enter Name: ");
            String name = sc.nextLine().trim();

            System.out.print("Enter Course: ");
            String course = sc.nextLine().trim();

            System.out.print("Enter Marks (0-100): ");
            double marks = Double.parseDouble(sc.nextLine().trim());

            if (marks < 0 || marks > 100) {
                System.out.println("✗ Marks must be between 0 and 100.");
                return;
            }
```

```
            Student s = new Student(roll, name, course, marks);
            students.add(s);
            System.out.println("✅ Student added successfully!");
        } catch (NumberFormatException e) {
            System.out.println("❌ Invalid input. Please enter correct values.");
        }
    }

    private static void displayAllStudents() {
        if (students.isEmpty()) {
            System.out.println("No students added yet.");
            return;
        }
        System.out.println("\n===== Student Records =====");
        for (Student s : students) {
            s.displayDetails();
        }
    }
}
```

Output:

```
C:\Users\dell\OneDrive\Desktop\StudentApp>java StudentRecordApp

===== Student Record Menu =====
1. Add Student
2. Display All Students
3. Exit
Enter your choice: 1
Enter Roll No: 24012009
Enter Name: Bhumit
Enter Course: BCA
Enter Marks (0?100): 98
? Student added successfully!

===== Student Record Menu =====
1. Add Student
2. Display All Students
3. Exit
Enter your choice: 2

===== Student Records =====
Roll No: 24012009
Name    : Bhumit
Course : BCA
Marks   : 98.0
Grade   : A
----------------------------------

===== Student Record Menu =====
1. Add Student
2. Display All Students
3. Exit
Enter your choice:
```