

# ***Java Assignment 3***

**Vaibhav Sharma**

**AIML-B2**

**22070126125**

**2022-26**

Write a menu-driven Java Program to study the concepts of classes, array of objects, instance members, constructors in java.

Assignment description: Create a Student class describing attributes of a student like prn, name, DoB, marks etc. Create an array of objects of Student class and perform operations like: Add students, Display, Search (by prn, by name, by position), Update/Edit and Delete

## **Code:**

```
//Main.java
```

```
//Vaibhav Sharma
```

```
//AIML-B2
```

```
//2022-26
```

```
//22070126125
```

```
package Assign3;
```

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

```
public class Main {
```

```
    public static void main(String[] args) {
```

```
        // Create a Scanner object to take user input
```

```
        Scanner sc = new Scanner(System.in);
```

```
        // Create an instance of UserInput class to handle student operations
```

```
        UserInput user = new UserInput();
```

```
        // Display menu and handle user input in a loop
```

```

while (true) {
    // Display menu options
    System.out.println("Menu:");
    System.out.println("1. Add Student");
    System.out.println("2. Display Students");
    System.out.println("3. Search by PRN");
    System.out.println("4. Update Student Name");
    System.out.println("5. Delete Student");
    System.out.println("6. Exit");
    System.out.print("Enter your choice: ");

    // Read user choice
    int choice = sc.nextInt();

    // Process user choice using switch statement
    switch (choice) {
        case 1:
            // Add a new student
            user.addStudent();
            break;
        case 2:
            // Display all student details
            System.out.println("Student Details:");
            user.display();
            break;
        case 3:
            // Search for a student by PRN
            System.out.println("Enter PRN to search:");
            int prn = sc.nextInt();
            int index = user.searchByPrn(prn);
            if (index != -1) {
                System.out.println("Student found at index " + index);
            }
        }
    }
}

```

```

    }
    else {
        System.out.println("Student not found.");
    }
    break;
case 4:
    // Update student name by PRN
    System.out.println("Enter PRN to update details:");
    int prn1 = sc.nextInt();
    user.updateName(prn1);
    user.display();
    break;
case 5:
    // Delete a student by PRN
    System.out.println("Enter PRN to delete:");
    int prn2 = sc.nextInt();
    user.deleteStudent(prn2);
    user.display();
    break;
case 6:
    // Exit the program
    System.out.println("Exiting program. Goodbye!");
    System.exit(0);
default:
    // Handle invalid choice
    System.out.println("Invalid choice. Please try again.");
}
}
}
}

```

// Student.java

```
package Assign3;

public class Student {
    // Private fields to store student information
    private int prn; // PRN
    private String name; // Name of the student
    private String dob; // Date of birth of the student
    private float marks; // Marks obtained by the student

    // Constructor to initialize the Student object
    Student(int prn, String name, String dob, float marks) {
        this.prn = prn;
        this.name = name;
        this.dob = dob;
        this.marks = marks;
    }

    // Setter method to set the PRN
    public void setPrn(int prn) {
        this.prn = prn;
    }

    // Getter method to get the PRN
    public int getPrn() {
        return prn;
    }

    // Setter method to set the name
    public void setName(String name) {
        this.name = name;
    }
}
```

```
// Getter method to get the name
```

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

```
// Setter method to set the date of birth
```

```
public void setDob(String dob) {  
    this.dob = dob;  
}
```

```
// Getter method to get the date of birth
```

```
public String getDob() {  
    return dob;  
}
```

```
// Setter method to set the marks
```

```
public void setMarks(float marks) {  
    this.marks = marks;  
}
```

```
// Getter method to get the marks
```

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

```
//UserInput.java
```

```
package Assign3;
```

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

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

```

public class UserInput {
    // ArrayList to store Student objects
    ArrayList<Student> student = new ArrayList<Student>();

    // Method to add students to the ArrayList
    public void addStudent() {
        Scanner sc = new Scanner(System.in);
        System.out.println("Enter number of students: ");
        int n = sc.nextInt();
        sc.nextLine();
        for (int i = 0; i < n; i++) {
            System.out.println("Enter details of student " + (i + 1) + ": ");
            String input = sc.nextLine();
            String[] details = input.split(" ");
            if (details.length >= 4) {
                // Extracting details from input and creating Student object
                int prn = Integer.parseInt(details[0]);
                String name = details[1];
                String dob = details[2];
                float marks = Float.parseFloat(details[3]);

                // Creating Student object and adding it to the ArrayList
                Student s = new Student(prn, name, dob, marks);
                student.add(s);
            } else {
                // Error message for invalid input format
                System.out.println("Invalid input format. Please enter details in the format: PRN Name  
DOB Marks");
                i--; // Decrementing the loop counter to re-enter the details
            }
        }
    }
}

```

```
// Method to display details of all students

public void display(){
    for(int i = 0; i < student.size(); i++){
        System.out.println(student.get(i).getPrn() + " " + student.get(i).getName() + " " +
student.get(i).getDob() + " " + student.get(i).getMarks());
    }
}
```

```
// Method to search for a student by PRN
```

```
public int searchByPrn(int prn){
    int index = -1;
    for(int i = 0; i < student.size(); i++){
        if(student.get(i).getPrn() == prn){
            index = i;
            break;
        }
    }
    return index;
}
```

```
// Method to update the name of a student by PRN
```

```
public void updateName(int prn){
    int index = searchByPrn(prn);
    if(index != -1){
        Scanner sc = new Scanner(System.in);
        System.out.println("Enter new name: ");
        String name = sc.nextLine();
        student.get(index).setName(name);
        System.out.println("Name updated successfully");
    }
    else {
        System.out.println("Student not found");
    }
}
```

```
}

// Method to delete a student by PRN
public void deleteStudent(int prn){
    int index = searchByPrn(prn);
    if(index != -1){
        student.remove(index);
        System.out.println("Student deleted successfully");
    }
    else {
        System.out.println("Student not found");
    }
}
}
```

Checkout and follow my github repository for more updates:

<https://github.com/vaibhav7766/PIJ/tree/main/Assign3>