Java Assignment 3

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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

```
//Main.java
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package Assignment_3;
 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
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package Assignment_3;
 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;
    }
}
```

```java
//UserInput.java
//SAMEER KHATWANI
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package Assignment_3;
 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");
        }
    }
}
```

Github Repo

https://github.com/samv28/PIJ