

# 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

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//Main.java
//SAMEER KHATWANI
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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;
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        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
//SAMEER KHATWANI
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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

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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
//SAMEER KHATWANI
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//22070126099
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++){

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        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>