PROGRAMMING IN JAVA LAB-3

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BATCH-AIML A1

Problem: Write a menu-driven Java Program to study the concepts ofclasses, arrayof objects, instance members, constructors in java.Assignment description: Create a Student class describing attributes of astudent like prn, name, DoB, marks etc. Create an array of objects ofStudent class and perform operations like: Add students, Display, Search(by prn, by name, by position), Update/Edit and Delete.

Solution: Using private(accessing using getter and setter) variables in a student class and using a student_functions class to perform operations on the student class such as add, display, search, update and delete. 2 classes are used to implement the solution.

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CODE:

```
import java.util.*;

public class StudentManager {
   public static void main(String[] args)
   {
      student_functions student_functions_object = new student_functions();

      // menu for add, display, search, update, delete
      while(true){
         System.out.println("Select the operation to modify database: ");
         System.out.println("0. Exit");
         System.out.println("1. Add student details");
         System.out.println("2. Display all");
         System.out.println("3. Search student");
         System.out.println("4. Update Details");
         System.out.println("5. Delete record");

         Scanner sc = new Scanner(System.in);
         int choice = sc.nextInt();

         switch(choice){
            case 0:
               System.out.println("Exiting...");
               break;
            case 1:
               student_functions_object.add_student();
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                break;
            case 2:
                student_functions_object.display();
                break;
            case 3:
                student_functions_object.search();
                break;
            case 4:
                student_functions_object.update();
                break;
            case 5:
                student_functions_object.delete();
                break;
            default:
                System.out.println("Invalid choice");
        }
        if(choice==0){
            break;
        }

    }
  }
}

class student {
  private int prn;
  private String name;
  private String dob;
  private int marks;

  public student(int prn, String name, String dob, int marks) {
    this.prn = prn;
    this.name = name;
    this.dob = dob;
    this.marks = marks;
  }

  public int getPrn() {
    return prn;
  }

  public void setPrn(int prn) {
    this.prn = prn;
  }

  public String getName() {
    return name;
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    }

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

    public String getDob() {
        return dob;
    }

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

    public int getMarks() {
        return marks;
    }

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

class student_functions {
    ArrayList<student> student_list = new ArrayList<student>();


    public void print_student(int i)
    {
        System.out.print("Name: " + student_list.get(i).getName()+" | ");
        System.out.print("PRN: " + student_list.get(i).getPrn()+" | ");
        System.out.print("DOB: "+ student_list.get(i).getDob()+" | ");
        System.out.print("Marks: " +student_list.get(i).getMarks()+"  | \n\n");
    }

    public void add_student() {
        Scanner sc = new Scanner(System.in);
        System.out.println("Enter the number of students to be added: ");
        int n = sc.nextInt();

        for (int i = 0; i < n; i++) {
            System.out.println("Enter the details of the student in the following format: PRN,
Name, Date of Birth (dd/mm/yyyy), Marks");
            String details = sc.next();

            String[] details_array = details.split(",");
            int prn = Integer.parseInt(details_array[0]);
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        String name = details_array[1];

        String dob_string = details_array[2];

        int marks = Integer.parseInt(details_array[3]);

        student new_student = new student(prn, name, dob_string, marks);
        student_list.add(new_student);
    }
}

public void display() {
    for (int i = 0; i < student_list.size(); i++) {
        print_student(i);
    }
}

public void search(){

    System.out.println("Select the search criteria: ");
    System.out.println("1. PRN");
    System.out.println("2. Name");
    System.out.println("3. Position");

    Scanner sc = new Scanner(System.in);
    int choice = sc.nextInt();

    switch(choice){
        case 1:
            // //Using contains method
            // System.out.println("Enter the PRN to be searched: ");
            // int temp_prn = sc.nextInt();
            // if(student_list.contains(temp_prn)){
            // int found = student_list.indexOf(temp_prn);
            // print_student(found);
            // }
            // else{
            //     System.out.println("PRN not found");
            // }

            //OR

            System.out.println("Enter the PRN to be searched: ");
            int prn = sc.nextInt();
            for (int i = 0; i < student_list.size(); i++) {
                if (student_list.get(i).getPrn() == prn) {
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                print_student(i);
            }
        }

        break;
    case 2:
        System.out.println("Enter the Name to be searched: ");
        String name = sc.next();
        for (int i = 0; i < student_list.size(); i++) {
            if (student_list.get(i).getName() == name) {
                print_student(i);
            }
        }
        break;
    case 3: //position
        System.out.println("Enter the Position to be searched: ");
        int position = sc.nextInt();
        for (int i = 0; i < student_list.size(); i++) {
            if (i == position) {
                print_student(i);
            }
        }
        break;
    default:
        System.out.println("Invalid choice");
  }

}

  public void update(){
    System.out.println("Enter the PRN of the student to be updated: ");
    Scanner sc = new Scanner(System.in);
    int prn = sc.nextInt();

    for (int i = 0; i < student_list.size(); i++) {
        if (student_list.get(i).getPrn() == prn) {
            System.out.println("Enter the details of the student in the following format: PRN,
Name, Date of Birth (dd/mm/yyyy), Marks");
            String details = sc.next();

            String[] details_array = details.split(",");
            int prn_new = Integer.parseInt(details_array[0]);

            String name_new = details_array[1];

            String dob_string_new = details_array[2];
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```
            int marks_new = Integer.parseInt(details_array[3]);

            student new_student = new student(prn_new, name_new, dob_string_new,
marks_new);
            student_list.set(i, new_student);
          }
        }
    }

    public void delete(){
        System.out.println("Enter the PRN of the student to be deleted: ");
        Scanner sc = new Scanner(System.in);
        int prn = sc.nextInt();

        for (int i = 0; i < student_list.size(); i++) {
          if (student_list.get(i).getPrn() == prn) {
            System.out.println("Student named:"+ student_list.get(i).getName() + " deleted
successfully");
            student_list.remove(i);
          }
        }
    }

}
```

OUTPUT: