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();  
 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;  
 }  
  
 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]);  
  
 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) {  
 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];  
  
 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:

Text

Description automatically generated