Case Studies..

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Case study 1 :

Create Student class (id, name, dateofbirth)

- Cover constructors, getters and setters

- Create class Info

- Write a method called as:

public void display(Student student) {

//Code here to display the details of given student

}

- Create App class with main method. Then

- Write a method called as scenario1 to:

- Create few objects of Student class

- Call the display method of Info class

- Write a method called as scenario2 to:

- Create array of Student class and store few objects in it

- Demonstrate how to iterate over the array and call the display method for each student

- Write a method called as scenario3 to:

- Take Student data as input from the user, store it in Student object

- Repeat the above process using loops

- Use Arrays to store the Student objects as covered in scenario2

- Finally iterate over the array to display all the collected data

- Now ask the trainees to create Course class on their own (id, name, duration, fees)

- Modify Info class by adding one more method:

public void display(Course course) {

//Code here to display the details of given course

}

- Ask them to practice some of the scenarios again

- Organize the code using packages/namespaces (for ex: com.mypack.casestudy.day1)

Class Course :

**public** **class** Course {

**private** **int** Cid;

**private** String cname;

**private** String cdur;

**private** **double** cfees;

**public** Course(**int** cid, String cname, String cdur, **double** cfees) {

**super**();

Cid = cid;

**this**.cname = cname;

**this**.cdur = cdur;

**this**.cfees = cfees;

}

**public** **int** getCid() {

**return** Cid;

}

**public** **void** setCid(**int** cid) {

Cid = cid;

}

**public** String getCname() {

**return** cname;

}

**public** **void** setCname(String cname) {

**this**.cname = cname;

}

**public** String getCdur() {

**return** cdur;

}

**public** **void** setCdur(String cdur) {

**this**.cdur = cdur;

}

**public** **double** getCfees() {

**return** cfees;

}

**public** **void** setCfees(**double** cfees) {

**this**.cfees = cfees;

}

}

Class Student :

**public** **class** Student {

**private** **int** stdid;

**private** String stdname;

**private** String stddob;

**private** **int** stdRoll;

**private** Course cr;

**public** Student(**int** stdid, String stdname, String stddob, **int** stdRoll, Course cr) {

**super**();

**this**.stdid = stdid;

**this**.stdname = stdname;

**this**.stddob = stddob;

**this**.stdRoll = stdRoll;

**this**.cr = cr;

}

**public** **int** getStdid() {

**return** stdid;

}

**public** **void** setStdid(**int** stdid) {

**this**.stdid = stdid;

}

**public** String getStdname() {

**return** stdname;

}

**public** **void** setStdname(String stdname) {

**this**.stdname = stdname;

}

**public** String getStddob() {

**return** stddob;

}

**public** **void** setStddob(String stddob) {

**this**.stddob = stddob;

}

**public** **int** getStdRoll() {

**return** stdRoll;

}

**public** **void** setStdRoll(**int** stdRoll) {

**this**.stdRoll = stdRoll;

}

**public** Course getCr() {

**return** cr;

}

**public** **void** setCr(Course cr) {

**this**.cr = cr;

}

}

Class StudentInfo :

**import** java.util.Scanner;

**public** **class** StudentInfo {

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

**public** Student[] CreateStudent() { // to create student data

System.***out***.println("How many students do you want : ");

**int** s = sc.nextInt();

Student student[] = **new** Student[s];

**for**(**int** i=0;i<student.length;i++) {

System.***out***.println("Enter Student ID : ");

**int** id = sc.nextInt();

System.***out***.println("Enter Student Name : ");

String name = sc.next();

System.***out***.println("Enter Student Birth date : ");

String dob = sc.next();

System.***out***.println("Enter Student Roll no : ");

**int** roll = sc.nextInt();

System.***out***.println("\nHow many Courses do you want : ");

**int** ye = sc.nextInt();

Course classroom[] = **new** Course[ye];

**for**(**int** j=0;j<classroom.length;j++) {

System.***out***.println("Enter Course ID : ");

**int** cid = sc.nextInt();

System.***out***.println("Enter Course name : ");

String cname = sc.next();

System.***out***.println("Enter Course duration : ");

String cdur = sc.next();

System.***out***.println("Enter Course fees : ");

**double** cfees = sc.nextDouble();

Course cor = **new** Course(cid, cname, cdur, cfees);

Student stud = **new** Student(id, name, dob, roll, cor);

student[i] = stud;

}

}

**return** student;

}

**public** **void** display(Student student[], Course classroom[]) { // to display student data

System.***out***.println("\n-----Details of the account------");

**for**(**int** i=0;i<student.length;i++) {

System.***out***.println("\nDetails of the" + (i+1) + "Student :-");

System.***out***.println("Student ID : " + student[i].getStdid());

System.***out***.println("Student Name : " + student[i].getStdname());

System.***out***.println("Student Birth date : " + student[i].getStddob());

System.***out***.println("Student Roll no : " + student[i].getStdRoll());

System.***out***.println("\n----Details of the Course----");

System.***out***.println("Course ID : " + student[i].getCr().getCid());

System.***out***.println("Course Name : " + student[i].getCr().getCname());

System.***out***.println("Course duration : " + student[i].getCr().getCdur());

System.***out***.println("Course fees : " + student[i].getCr().getCfees());

}

}

}

Class StudentMain :

**import** java.util.Scanner;

**public** **class** StudentMain {

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

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

StudentInfo sinfo = **new** StudentInfo();

**int** ch = 0;

Student s[] = **null**;

Course c[] = **null**;

**do** {

System.***out***.println("\n\tScenerio 1 : Create Student Information\n\tScenerio 2 : Display Student Information");

System.***out***.println("\nEnter your choice : ");

ch = sc.nextInt();

**switch**(ch) {

**case** 1 :

s = sinfo.CreateStudent();

**break**;

**case** 2 :

sinfo.display(s, c);

**break**;

**default** :

System.***out***.println("Invalid choice !");

**break**;

}

System.***out***.println("\nDo you want to continue? press 1");

ch = sc.nextInt();

}**while**(ch==1);

System.***out***.println("\n--Thank you--");

}

}

Case Study 2 :

- Create Enroll class with the following structure:

- public class Enroll {

private Student student;

private Course course;

private LocalDate enrollmentDate;

//constructors & getters/setters

}

- Next create AppEngine class which will contain the following methods:

- public void introduce(Course course) {

}

- public void register(Student student) {

}

- public Student[] listOfStudents() {

}

- public Course[] listOfCourses() {

}

- public void enroll(Student student, Course course) {

}

- public Enroll[] listOfEnrollments() {

}

- Write App class with main method to test the above functionalities

- Ask trainees to modify Info class by adding new methods for displaying Enrollment details

Class Student :

**public** **class** Student {

**private** **int** stdid;

**private** String stdname;

**private** String stdob;

**public** Student(**int** stdid, String stdname, String stdob) {

**super**();

**this**.stdid = stdid;

**this**.stdname = stdname;

**this**.stdob = stdob;

}

**public** **int** getStdid() {

**return** stdid;

}

**public** **void** setStdid(**int** stdid) {

**this**.stdid = stdid;

}

**public** String getStdname() {

**return** stdname;

}

**public** **void** setStdname(String stdname) {

**this**.stdname = stdname;

}

**public** String getStdob() {

**return** stdob;

}

**public** **void** setStdob(String stdob) {

**this**.stdob = stdob;

}

}

Class LocalDate :

**import** java.util.Date;

**public** **class** LocalDate {

**private** Date jdate;

**public** LocalDate(Date jdate) {

**super**();

**this**.jdate = jdate;

}

**public** Date getJdate() {

**return** jdate;

}

**public** **void** setJdate(Date jdate) {

**this**.jdate = jdate;

}

}

Class Course :

**public** **class** Course {

**private** **int** courseid;

**private** String coursename;

**private** String coursedur;

**private** **double** coursefee;

**public** Course(**int** courseid, String coursename, String coursedur, **double** coursefee) {

**super**();

**this**.courseid = courseid;

**this**.coursename = coursename;

**this**.coursedur = coursedur;

**this**.coursefee = coursefee;

}

**public** **int** getCourseid() {

**return** courseid;

}

**public** **void** setCourseid(**int** courseid) {

**this**.courseid = courseid;

}

**public** String getCoursename() {

**return** coursename;

}

**public** **void** setCoursename(String coursename) {

**this**.coursename = coursename;

}

**public** String getCoursedur() {

**return** coursedur;

}

**public** **void** setCoursedur(String coursedur) {

**this**.coursedur = coursedur;

}

**public** **double** getCoursefee() {

**return** coursefee;

}

**public** **void** setCoursefee(**double** coursefee) {

**this**.coursefee = coursefee;

}

}

Class Enroll :

**public** **class** Enroll {

**private** Student stud;

**private** Course course;

**private** LocalDate ldate;

**public** Enroll(Student stud, Course course, LocalDate ldate) {

**super**();

**this**.stud = stud;

**this**.course = course;

**this**.ldate = ldate;

}

**public** Student getStud() {

**return** stud;

}

**public** **void** setStud(Student stud) {

**this**.stud = stud;

}

**public** Course getCourse() {

**return** course;

}

**public** **void** setCourse(Course course) {

**this**.course = course;

}

**public** LocalDate getLdate() {

**return** ldate;

}

**public** **void** setLdate(LocalDate ldate) {

**this**.ldate = ldate;

}

}

Class AppEngine :

**import** java.util.Scanner;

**public** **class** AppEngine {

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

**public** Course introduce() { // To create course information of single course

System.***out***.println("Enter Course ID : ");

**int** cid = sc.nextInt();

System.***out***.println("Enter Course Name : ");

String cname = sc.next();

System.***out***.println("Enter Course duration : ");

String cdur = sc.next();

System.***out***.println("Enter Course fees : ");

**double** fees = sc.nextDouble();

Course cor = **new** Course(cid, cname, cdur, fees);

**return** cor; //1

}

**public** Student register() { // To create student information of single student

System.***out***.println("Enter Student ID : ");

**int** sid = sc.nextInt();

System.***out***.println("Enter Student Name : ");

String sname = sc.next();

System.***out***.println("Enter Student DOB : ");

String sdob = sc.next();

Student student = **new** Student(sid, sname, sdob);

**return** student; //2

}

**public** Student[] listofStudents() { // To create student information of multiple students

System.***out***.println("How many students do you want to enroll for the Course : ");

**int** n = sc.nextInt();

Student stud[] = **new** Student[n];

**for**(**int** i=0;i<stud.length;i++) {

System.***out***.println("Enter Student ID, Student Name and Student DOB : ");

**int** stid = sc.nextInt();

String stname = sc.next();

String stdob = sc.next();

Student ssud = **new** Student(stid, stname, stdob);

stud[i] = ssud;

}

**return** stud; //3

}

**public** Course[] listofCourses() { // To create course information of multiple students

System.***out***.println("How many Courses do you want a student to enroll ?");

**int** n1 = sc.nextInt();

Course cour[] = **new** Course[n1];

**for**(**int** i=0;i<cour.length;i++) {

System.***out***.println("Enter Course ID, Course Name, Course duration and Course fees : ");

**int** corid = sc.nextInt();

String corname = sc.next();

String cordur = sc.next();

**double** corfees = sc.nextDouble();

Course corr = **new** Course(corid, corname, cordur, corfees);

cour[i] = corr;

}

**return** cour; //4

}

**public** **void** display(Student stud[], Course cour[]) { // To display Course and Student information of multiple Students..

System.***out***.println("\n---One Student Many courses---");

System.***out***.println("\n");

System.***out***.println("----------Student Details----------");

**for**(**int** i=0;i<stud.length;i++) {

System.***out***.println("Student ID : " + stud[i].getStdid());

System.***out***.println("Student Name : " + stud[i].getStdname());

System.***out***.println("Student DOB : " + stud[i].getStdob());

System.***out***.println("\n---Course Information----");

**for**(**int** i1=0;i1<cour.length;i1++) {

System.***out***.println("Course ID : " + cour[i1].getCourseid());

System.***out***.println("Course Name : " + cour[i1].getCoursename());

System.***out***.println("Course Duration : " + cour[i1].getCoursedur());

System.***out***.println("Course Fees : " + cour[i1].getCoursefee());

System.***out***.println("\n");

}

}

}

**public** **void** enroll(Student student, Course cor) { // To display course and student information of single student

System.***out***.println("----------Student Details----------");

System.***out***.println("Student ID : " + student.getStdid());

System.***out***.println("Student Name : " + student.getStdname());

System.***out***.println("Student DOB : " + student.getStdob());

System.***out***.println("\n--------Course Details---------");

System.***out***.println("Course ID : " + cor.getCourseid());

System.***out***.println("Course Name : " + cor.getCoursename());

System.***out***.println("Course Duration : " + cor.getCoursedur());

System.***out***.println("Course Fees : " + cor.getCoursefee());

}

}

Class AppClass :

**import** java.util.Scanner;

**public** **class** AppClass {

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

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

**int** ch = 0;

AppEngine engine = **new** AppEngine();

**do**

{

System.***out***.println("1 - To Display Course information for a single student\n2 - To Display Course information for Multiple Students : ");

System.***out***.println("Enter your Choice : ");

ch = sc.nextInt();

**switch**(ch)

{

**case** 1 :

Student s = engine.register();

Course er = engine.introduce();

engine.enroll(s, er);

**break**;

**case** 2 :

Student[] s1 = engine.listofStudents();

Course[] c1 = engine.listofCourses();

engine.display(s1, c1);

**break**;

**default** :

System.***out***.println("Invalid Choice...");

**break**;

}

System.***out***.println("\nDo you want to continue ? (Press 1)");

ch = sc.nextInt();

}**while**(ch==1);

System.***out***.println("-----Thank you----");

}

}

Case Study 3 :

- Enchance the Enroll class from Day 2 and ask the trainees to use Collection API instead of Arrays

- Then the next step is to create user interface for our application.

- Create an abstract class/interface (UserInterface) with the following methods:

public void showFirstScreen();

public void showStudentScreen();

public void showAdminScreen();

public void showAllStudentsScreen();

public void showStudentRegistrationScreen(); // Execute the register method of

AppEngine class

public void introduceNewCourseScreen();

public void showAllCoursesScreen();

- The code for showFirstScreen() may look like this in Java:

public void showFirstScreen() {

System.out.println("Welcome to SMS(Student Mgmt. System) v1.0");

System.out.println("Tell us who you are : \n1. Student\n2. Admin");

System.out.println("Enter your choice ( 1 or 2 ) : ");

Scanner scanner = new Scanner(System.in);

int op = Integer.parseInt(scanner.nextLine());

switch(op) {

case 1:

showStudentScreen();

break;

case 2:

showAdminScreen();

break;

}

}

- From the App class now, all we would do in the main method is:

- new UserInterface().showFirstScreen();

Case Study 4 :

- We had created an AppEngine class before to store data in memory.

- All we need to do now is to modify that code and introduce database connectivity.

For ex: the code for register method might look like this in Java

public void register(Student student) {

Connection conn = null;

PreparedStatement stmt = null;

try {

Class.forName("org.apache.derby.jdbc.ClientDriver");

conn = DriverManager.getConnection("jdbc:derby://localhost:1527/training","user","pass");

String sql = "insert into student values(?,?,?)";

stmt = conn.prepareStatement(sql);

stmt.setInt(1, student.getId());

stmt.setString(2, student.getName());

stmt.setInt(3, student.getRollno());

stmt.executeUpdate();

}

catch(ClassNotFoundException | SQLException e) {

e.printStackTrace(); //instead throw user defined exception

}

finally {

try { stmt.close(); } catch(Exception e) { }

try { conn.close(); } catch(Exception e) { }

}

}