

Project 1:

Build a Solution Using Object Oriented Programming in Java

Description:

To build the Solution using Object Oriented Programming in Java. This assignment is designed to help understand working with OOPS in Java and how the polymorphic behavior can be implemented.

Problem Statement:

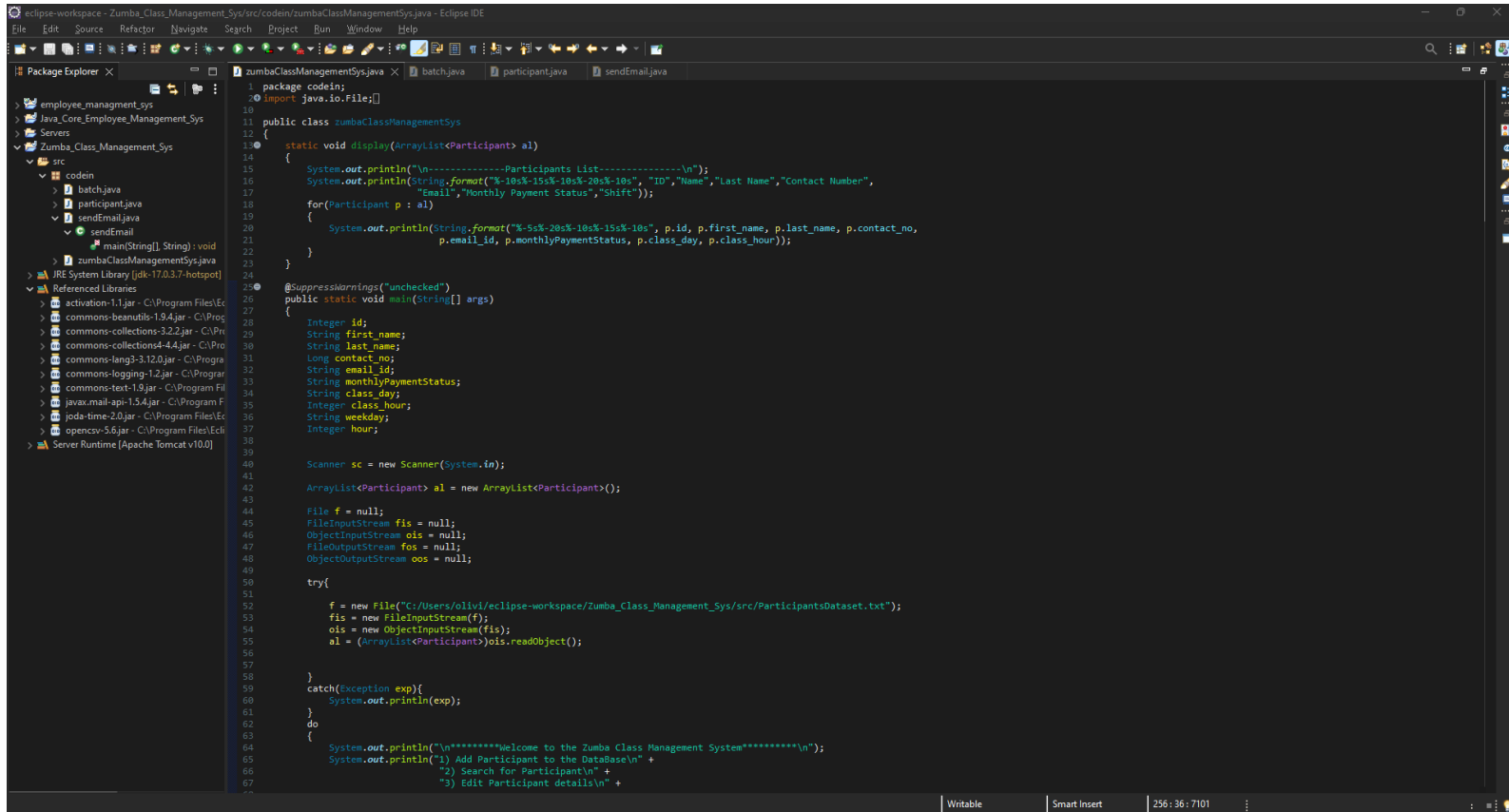
Yasmin is a Gym Instructor. She takes multiple sessions of Zumba during the day, for which she has divided his participants into batches running in the morning and evening hours. To manage his participants, she needs a software solution to record the details of his participants and batches. Luckily his friend Mike runs a software company. Therefore, Yasmin has requested the company to develop a software solution to manage his participants and batches.

The company aims to develop a core java based solution using OOPS.

Perform the below tasks as a solution:

1. Create a Java Project in Eclipse
2. Create a Participant Class
3. Create a Batch Class
4. Create 1 to many relationship mapping for the Batch and Participant
5. Take the inputs from the User using Scanner class to create Participant and Batch Objects
6. Implement Method callbacks using Run time Polymorphism, when a batch starts, the Participant should receive a message.
7. Run the Code in the main class.

zumbaClassManagementSys.java



```
1 package codein;
2 import java.io.File;
3
4 public class zumbaClassManagementSys
5 {
6     static void display(ArrayList<Participant> al)
7     {
8         System.out.println("\n-----Participants List-----\n");
9         System.out.println(String.format("%-10s%-15s%-10s%-10s", "ID", "Name", "Last Name", "Contact Number",
10             "Email", "Monthly Payment Status", "Shift"));
11         for(Participant p : al)
12         {
13             System.out.println(String.format("%-5s%-20s%-10s%-15s%-10s", p.id, p.first_name, p.last_name, p.contact_no,
14                 p.email_id, p.monthlyPaymentStatus, p.class_day, p.class_hour));
15         }
16     }
17
18     @SuppressWarnings("unchecked")
19     public static void main(String[] args)
20     {
21         Integer id;
22         String first_name;
23         String last_name;
24         Long contact_no;
25         String email_id;
26         String monthlyPaymentStatus;
27         String class_day;
28         Integer class_hour;
29         String weekday;
30         Integer hour;
31
32         Scanner sc = new Scanner(System.in);
33
34         ArrayList<Participant> al = new ArrayList<Participant>();
35
36         File f = null;
37         FileInputStream fis = null;
38         ObjectInputStream ois = null;
39         FileOutputStream fos = null;
40         ObjectOutputStream oos = null;
41
42         try{
43             f = new File("C:/Users/olivi/eclipse-workspace/Zumba_Class_Management_Sys/src/ParticipantsDataset.txt");
44             fis = new FileInputStream(f);
45             ois = new ObjectInputStream(fis);
46             al = (ArrayList<Participant>)ois.readObject();
47         }
48         catch(Exception exp){
49             System.out.println(exp);
50         }
51         do
52         {
53             System.out.println("\n*****Welcome to the Zumba Class Management System*****\n");
54             System.out.println("1) Add Participant to the DataBase\n" +
55                 "2) Search for Participant\n" +
56                 "3) Edit Participant details\n" +
57                 "4) Delete Participant details\n" +
58                 "5) Display all Participant signed up in Zumba Classes\n" +
59                 "6) Send message to Participants from actual Batch\n" +
60                 "7) EXIT\n");
61
62             System.out.println("Enter your choice:");
63             int ch = sc.nextInt();
64
65             switch(ch)
66             {
67                 case 1: System.out.println("Enter the following details to ADD list:");
68                     System.out.println("Enter ID:");
69                     id = sc.nextInt();
70
71                     System.out.println("Enter Name:");
72                     first_name = sc.next();
73
74                     System.out.println("Enter Last Name:");
75                     last_name = sc.next();
76
77                     System.out.println("Enter Contact Number:");
78                     contact_no = sc.nextLong();
79
80                     System.out.println("Enter Email:");
81                     email_id = sc.next();
82
83                     System.out.println("Enter Monthly Payment Status:");
84                     monthlyPaymentStatus = sc.next();
85
86                     System.out.println("Enter Class Day:");
87                     class_day = sc.next();
88
89                     System.out.println("Enter Class Hour:");
90                     class_hour = sc.nextInt();
91
92                     al.add(new Participant(id, first_name, last_name, contact_no, email_id, monthlyPaymentStatus, class_day, class_hour));
93                     display(al);
94                     break;
95
96                 case 2: System.out.println("Enter the Participant ID to search:");
97                     id = sc.nextInt();
98
99                     int i=0;
100                     for(Participant p: al)
101                     {
102                         if(id == p.id)
103                         {
104                             System.out.println(p + "\n");
105                             i++;
106                         }
107                     }
108                     if(i == 0)
109                     {
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eclipse-workspace - Zumba_Class_Management_Sys/src/codem/zumbaClassManagementSys.java - Eclipse IDE
File Edit Source Refactor Navigate Search Project Run Window Help

Package Explorer X
  employee_management_sys
  Java_Core_Employee_Management_Sys
  Servers
  Zumba_Class_Management_Sys
    src
      codem
        batch.java
        participant.java
        sendEmail.java
        zumbaClassManagementSys.java
          display(ArrayList<Participant>
            main(String[]) : void
  JRE System Library [jdk-17.0.3.7-hotspot]
  Referenced Libraries
    activation-1.1.jar - C:\Program Files\Ec
    commons-beanutils-1.9.4.jar - C:\Progr
    commons-collections-3.2.2.jar - C:\Pro
    commons-collections-4.4.jar - C:\Progr
    commons-lang3-3.12.0.jar - C:\Progra
    commons-logging-1.2.jar - C:\Program
    commons-text-1.9.jar - C:\Program Fi
    javax.mail-api-1.5.4.jar - C:\Program F
    joda-time-2.0.jar - C:\Program Files\Ec
    opencv-5.6.jar - C:\Program Files\Ech
    Server Runtime [Apache Tomcat v10.0]

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case 9: j++;
break;

default : System.out.println("\nEnter a correct choice from the List:");
break;

}

while(j==1);
}

if(j == 0)
{
    System.out.println("\nParticipant Details are not available.\nPlease enter a valid ID!");
}

break;

case 4: System.out.println("\nEnter Participant ID to DELETE from the Database:");
id = sc.nextInt();
int k=0;
try{
    for(Participant p: al)
    {
        if(id == p.id)
        {
            al.remove(p);
            display(al);
            k++;
        }
    }
    if(k == 0)
    {
        System.out.println("\nParticipant Details are not available.\nPlease enter a valid ID!");
    }
}
catch(Exception ex){
    System.out.println(ex);
}
break;

case 5: try {
    al = (ArrayList<Participant>)ois.readObject();
} catch (ClassNotFoundException e2) {
    System.out.println(e2);
} catch (Exception e2) {
    System.out.println(e2);
}

display(al);
break;

case 6: System.out.println("Enter the Class Weekday:");
weekday = sc.next();

System.out.println("Enter the Class Hour:");
hour = sc.nextInt();

}

}

while(true);
}

}
```

```
eclipse-workspace - Zumba_Class_Management_Sys/src/codem/zumbaClassManagementSys.java - Eclipse IDE
File Edit Source Refactor Navigate Search Project Run Window Help

Package Explorer X
  employee_management_sys
  Java_Core_Employee_Management_Sys
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  Zumba_Class_Management_Sys
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        batch.java
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    commons-text-1.9.jar - C:\Program Fi
    javax.mail-api-1.5.4.jar - C:\Program F
    joda-time-2.0.jar - C:\Program Files\Ec
    opencv-5.6.jar - C:\Program Files\Ech
    Server Runtime [Apache Tomcat v10.0]

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case 6: System.out.println("Enter the Class Weekday:");
weekday = sc.next();

System.out.println("Enter the Class Hour:");
hour = sc.nextInt();

int counter=0;
for(Participant p: al)
{
    if(weekday == p.class_day && hour == p.class_hour)
    {
        sendEmail.main(args, p.email_id);
        counter++;
    }
}

if(counter == 0)
{
    System.out.println("\nParticipant Details are not available.\nPlease enter a valid Weekday and Hour!");
}

break;

case 7: try {
    fos = new FileOutputStream(f);
    oos = new ObjectOutputStream(fos);
    oos.writeObject(al);
} catch (IOException e1) {
    e1.printStackTrace();
}

catch(Exception e2){
    e2.printStackTrace();
}

finally{
    try {
        fis.close();
        ois.close();
        fos.close();
        oos.close();
    } catch (Exception e1) {
        e1.printStackTrace();
    }

    System.out.println("\nYou have chosen EXIT!\nSaving Files and closing the tool.");
    sc.close();

    System.exit(0);
    break;
}

default : System.out.println("\nEnter a correct choice from the List:");
break;

}

}

while(true);
}

}
```

batch.java

```
package codein;
import java.io.Serializable;

@SuppressWarnings("serial")
class Batch extends Participant implements Serializable{

    String day;
    int hour;

    public Batch(int id, String first_name, String last_name, long contact_no, String email_id, String
monthlyPaymentStatus, String day, int hour)
    {
        super(id, first_name, last_name, contact_no, email_id, monthlyPaymentStatus, day, hour);
        this.day = day;
        this.hour= hour;
    }

    public String getDay()
    {
        return day;
    }

    public int getHour(int hour)
    {
        return hour;
    }

    public String toString()
    {
        return "\nBatch Details:" + "\nShift:" + this.day + "\nHour:" + this.hour;
    }
}
```

participant.java

```
package codein;
import java.io.Serializable;

@SuppressWarnings("serial")
class Participant implements Serializable{

    int id;
    String first_name;
    String last_name;
    long contact_no;
    String email_id;
    String monthlyPaymentStatus;
    String class_day;
    int class_hour;

    public Participant(int id, String first_name, String last_name, long contact_no, String email_id, String
monthlyPaymentStatus, String class_day, int class_hour)
    {
        this.id = id;
        this.first_name = first_name;
        this.last_name = last_name;
        this.contact_no = contact_no;
        this.email_id = email_id;
        this.monthlyPaymentStatus = monthlyPaymentStatus;
        this.class_day = class_day;
        this.class_hour = class_hour;
    }

    public String toString()
    {
        return "\nParticipant Details:" + "\nID: " + this.id + "\nName: " + this.first_name + "\nLast Name:
" + this.last_name
                + "\nContact Number: " + this.contact_no + "\nEmail: " + this.email_id +
"\nMonthly Payment Status: " + this.monthlyPaymentStatus
                + "\nClass Day: " + this.class_day + "\nClass Hour: " + this.class_hour;
    }
}
```

sendEmail.java

```
package codein;
import java.util.Properties;
import javax.mail.Message;
import javax.mail.MessagingException;
import javax.mail.Session;
import javax.mail.Transport;
import javax.mail.internet.InternetAddress;
import javax.mail.internet.MimeMessage;

public class sendEmail {

    public static void main(String [] args, String email_id) {
        // Recipient's email ID needs to be mentioned.
        String to = email_id;

        // Sender's email ID needs to be mentioned
        String from = "teacher_yasmin@gmail.com";

        // Assuming you are sending email from localhost
        String host = "localhost";

        // Get system properties
        Properties properties = System.getProperties();

        // Setup mail server
        properties.setProperty("mail.smtp.host", host);

        // Get the default Session object.
        Session session = Session.getDefaultInstance(properties);

        try {
            // Create a default MimeMessage object.
            MimeMessage message = new MimeMessage(session);

            // Set From: header field of the header.
            message.setFrom(new InternetAddress(from));

























            // Set To: header field of the header.
            message.addRecipient(Message.RecipientType.TO, new InternetAddress(to));

            // Set Subject: header field
            message.setSubject("Zumba Class Remainder");

            // Now set the actual message
            message.setText("Your Zumba Class is about to begin!");
```

```
// Send message
Transport.send(message);
System.out.println("Sent message successfully...");
} catch (MessagingException mex) {
    mex.printStackTrace();
}
}
```


Zumba Java Project Architecture

- ▼  Zumba_Class_Management_Sys
 - ▼  src
 - ▼  codein
 - ▼  batch.java
 - ▼  Batch
 - △ day
 - △ hour
 - Batch(int, String, String, long, String, String, String, int)
 - getDay() : String
 - getHour(int) : int
 - toString() : String
 - ▼  participant.java
 - ▼  Participant
 - △ class_day
 - △ class_hour
 - △ contact_no
 - △ email_id
 - △ first_name
 - △ id
 - △ last_name
 - △ monthlyPaymentStatus
 - Participant(int, String, String, long, String, String, String, int)
 - toString() : String
 - ▼  sendEmail.java
 - ▼  sendEmail
 - main(String[], String) : void
 - ▼  zumbaClassManagementSys.java
 - ▼  zumbaClassManagementSys
 - ▲ main(ArrayList<Participant>) : void
 - main(String[]) : void
 - >  JRE System Library [jdk-17.0.3.7-hotspot]
 - ▼  Referenced Libraries
 - >  activation-1.1.jar - C:\Program Files\Eclipse Adoptium\jdk-17.0.3.7-hotspot
 - >  commons-beanutils-1.9.4.jar - C:\Program Files\Eclipse Adoptium\jdk-17.0.3.7-hotspot
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 - >  opencsv-5.6.jar - C:\Program Files\Eclipse Adoptium\jdk-17.0.3.7-hotspot
 - >  Server Runtime [Apache Tomcat v10.0]