



Informatics Institute of Technology School of Computing Software Development II Coursework Report

Module : 4COSC010C.2: Software Development II (2023)

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Tutorial group (day, time, and tutor/s):

Group: 7

Day: Wednesday

Time: 1.30pm - 3.30pm

Tutors: Dimithri Premachandra

Dinusha Ruwan Kumara

"I confirm that I understand what plagiarism / collusion / contract cheating is and have read and understood the section on Assessment Offences in the Essential Information for Students. The work that I have submitted is entirely my own. Any work from other authors is duly referenced and acknowledged."

Name : Sashiraj Akaash

Student ID : IIT No- 20231979 | UOW No - w2051998

Self-assessment form and test plan

1) Self-assessment form

| Task | Self-assessment (select | Comments |
|--|------------------------------|---|
| | one) | |
| 1 | ⊠Fully implemented | Here a 2D array was used for |
| | □Partially implemented | the seating plan. At the start |
| | □Not attempted | of this program all seats are |
| | | should be available for that I |
| | | used Enhanced for-loop to |
| | | assigned zero for seats. |
| 2 | ⊠Fully implemented | This menu option is created |
| | □Partially implemented | as a separate method called |
| | □Not attempted | menu(). And user in input 0, |
| | | When program ask to select |
| | | the option the program will terminated. |
| Insert here a sereenshet o | f your welcome message and i | |
| | . your wordsmo moodage and i | |
| 1) Buy a seat 2) Cancel a seat 3) Find first seat available 4) Show seating plan 5) Print tickets information 6) Search tickets 0) Quit *********************************** | and total sales | The huy goot method coles |
| 3 | ⊠Fully implemented | The buy_seat method asks the user to enter a seat |
| | ☐Partially implemented | number and a row letter (A- |
| | □Not attempted | D), validates the input, determines whether the seat is available, marks the seat as sold. Error messages are displayed in response to invalid input and unavailable seats. |

| 4 | ☑Fully implemented☐Partially implemented☐Not attempted | If a reserved seat is available, the cancel_seat function requests the row letter and seat number from the user, cancels it, and verifies the cancellation. The user is notified if the assigned seat is not reserved. | | | |
|--------------------|---|--|--|--|--|
| 5 | □ Fully implemented□ Partially implemented□ Not attempted | The find_first_available function loops through the seat array in search of the first open seat on the plane. The first available seat's row letter and seat number are printed. It prints a notice stating that all tickets are reserved if there are no seats available .here used nested for-loop for check the availability of seats in 2D array | | | |
| 6 | □ Fully implemented□ Partially implemented□ Not attempted | The plane's seating arrangement is shown using the show_seating_plan method. using an enhanced loop., it iterates through each row of seats, printing the row label ('A', 'B', 'C', etc.) and the seat status ('0' for available, 'X' for booked). | | | |
| Select your option | Insert here a screenshot of the seating plan: | | | | |
| 4 | | | | | |
| A O O O O O O O | $egin{array}{cccccccccccccccccccccccccccccccccccc$ | | | | |
| C O O O O O | | | | | |
| D 0 0 0 0 0 | 0 0 0 0 0 0 0 | | | | |

| 7 | ☑Fully implemented☐Partially implemented☐Not attempted | Print method print the information input by the passenger by taking them from getters. |
|----|--|---|
| 8 | ☑Fully implemented☐Partially implemented☐Not attempted | Information about tickets, including row letter, seat number, price, and passenger details, are managed by the Tickets class. It provides ways to obtain and modify these properties. The TicketDetails method prints the ticket information with passenger detail |
| 9 | ☑Fully implemented☐Partially implemented☐Not attempted | Ticket and user's input will added to the array. |
| 10 | ☑Fully implemented☐Partially implemented☐Not attempted | The method outputs the information about each booked seat, iterates through them, and determines the total cost of all booked tickets. To access ticket objects stored in a 2D array and display ticket details, it runs the TicketDetails function using nested loops. |
| 11 | ☑Fully implemented☐Partially implemented☐Not attempted | By entering the row letter (A–D) and seat number, the user can search for a booked ticket using this method. The user is notified that the seat is available for booking if there is no ticket at the indicated location; if there is, its details are provided. |
| 12 | ☑Fully implemented☐Partially implemented☐Not attempted | This method saves the passenger information and seat information that is entered by user.This create |

| | a external file to save the details that entered by user. |
|--|---|
| | |

2) Test Plan

Complete the test plan describing which testing you have performed on your program. Add as many rows as you need.

Part A Testing

| Test case / scenario | Input | Expected Output | Output | Pass/Fail |
|------------------------------------|--|---|---|----------------|
| When invalid option selected | Option = any alphabet letter or something not in 0-6 | Give a message to user to enter the number between 0-6. | Prints "Incorrect input. Please enter a number (0-6):" | ⊠Pass □Fail |
| When user input valid row and seat | Option= 1 Row=A Seat=3 Name=Sachin Surname=Tendulkar Email=sachin@12.com | A3 seat is booked and information saved as ticket | Prints "Your Ticket is booked. Thank you " And also save ticket in booking information file as text file named "A3" | ⊠Pass □Fail |
| When user input invalid row | Option= 1 Row=S Seat=3 | Print a message to user that the input is invalid | Prints" Your selection is invalid. Please try again" | ⊠Pass □Fail |
| When user input invalid seatno | Option= 1 Row=A Seat=30 | Print a message to user that the input is invalid | Prints" Your selection is invalid. Please try again" | ⊠Pass □Fail |
| When user not enter the name | Option= 1 Row=A Seat=3 Name= | Print a message that name cannot be empty | Prints" Passenger's Name cannot be empty. Enter passenger's name:" | ⊠Pass □Fail |

| When user not enter the surname | Option= 1 Row=A Seat=3 Name=Sachin Surname= | Print a message that Surname cannot be empty | Prints" Passenger's Surname cannot be empty. Enter passenger's surname:" | ⊠Pass □Fail |
|--|---|---|--|----------------|
| When user not enter the email | Option= 1 Row=A Seat=3 Name=Sachin Surname=Tendulkar Email= | Print a message that email cannot be empty | Prints" Passenger's Email cannot be empty. Enter passenger's Email: " | ⊠Pass □Fail |
| When user enter the already booked row and seat number | Option= 1 Row=A Seat=3 | Print a message that this seat is already booked. | Prints" Sorry this ticket is already bookedTry another seat to book" | ⊠Pass □Fail |
| When user enter the valid row and seat to cancel the booking | Option= 2 Row=A Seat=3 | Print a message that that seat booking is canceled. | Prints "Your booking is cancelled" | ⊠Pass □Fail |
| When user enter the invalid row and seat to cancel the booking | Option= 2 Row=A Seat=5 | Print a message that that seat is not booked yet. | Prints "This seat is not booked yet" | ⊠Pass □Fail |
| When user input valid row and seat to see | Option= 3 | Print the seat that available first. | Prints" First available seats: row= A Seat Number= 1" | ⊠Pass □Fail |

| first available seat When all seat are booked | Option=3 | Print a message that all seats are booked | Prints "All Tickets are booked" | ⊠Pass □Fail |
|--|--|---|---|----------------|
| When user want to buy another seat | Option= 1 Row=A Seat=5 Name=Virat Surname=kohli Email=virat@12.com | A15seat is booked and information saved as ticket | Prints "Your Ticket is booked. Thank you " And also save ticket in booking information file as text file named "A5" | ⊠Pass □Fail |
| When user needs to see seating plan | Option=4 | Print seating plan (0000X0000000000000000000000000000000 | Print seating plan (0000X0000000000000000000000000000000 | ⊠Pass □Fail |

Part B testing

| Test case / scenario | Input | Expected Output | Output | Pass/Fail |
|------------------------------------|---|---|---|----------------|
| When user want to buy another seat | Option= 1 Row=A Seat=5 Name=Virat Surname=kohli Email=virat@12.com | A15seat is booked and information saved as ticket | Prints "Your Ticket is booked. Thank you " And also save ticket in booking information file as text file named "A5" | ⊠Pass □Fail |
| When user needs to search a ticket | Option=6 Row=A | Print the detail that store in txt file named as "A5" | Passenger Ticket Information Row: A Seat: 5 | ⊠Pass □Fail |

| | 0 | | Drings COOO | |
|-------------------------|-----------|---------------------------|------------------------------------|-------|
| | Seat=5 | | Price: £200 | |
| | | | Passenger's detail | |
| | | | Name: virat | |
| | | | Surname: kohli | |
| | | | Email:virat@12.com | |
| | | | | |
| When user input invalid | Option= 1 | Print a message to user | Prints" Your selection is invalid. | ⊠Pass |
| row to search seat | Row=S | that the input is invalid | Please try again" | □Fail |
| | Seat=3 | | | ши |
| | | | | |
| | | | | |
| | | | | |
| When user input invalid | Option= 1 | Print a message to user | Prints" Your selection is invalid. | ⊠Pass |
| seat number to search | Row=A | that the input is invalid | Please try again" | □Fail |
| seat | Seat=30 | | | |
| | | | | |
| | | | | |
| | | | | |
| When user need to see | | | Passenger Ticket Information | ⊠Pass |
| all the tickets deatail | | | Row: A | □Fail |
| and Total price | | | Seat: 3 Price: £200 | |
| • | | | FIICE. £200 | |
| | | | Passenger's detail | |
| | | | Name: Sachin | |
| | | | Surname: tendulkar | |
| | | | Email:sachin@12.com | |
| | | | | |
| | | | Passenger Ticket Information | |
| | | | Row: A | |
| | | | Seat: 5 Price: £200 | |
| | | | FIICE. ZZUU | |
| | | | Passenger's detail | |
| | | | Name: virat | |
| | | | Surname: kohli | |
| | | | Email:virat@12.com | |
| | | | | |
| | | | Total price is a CACC | |
| | | | Total price is: £400 | |
| | | | | |

Are there any specific parts of the coursework which you would like to get feedback?

1. I created this preview of the seating plan at the starting of this program for give a information about price of seats for user.

```
<<<<Welcome to Plane Management System!!>>>>
       2
                   5
                                8
                                        10
                                          11
                                                12
                                                        14
   1
           3
                        6
                                                   13
   0
       0
           0
               0
                   0
                       0
                           0
                                0
                                    0
                                        0
                                            0
                                                0
                                                    0
   0
       0
           0
               0
                   0
                       0
                           0
                               0
                                    0
                                        0
                                            0
                                                0
   0
       0
                   0
                                   0
                                                0
   0
       0
           0
                0
                   0
                       0
                           0
                                0
                                    0
                                        0
                                            0
                                                0
                                                    0
                                                        0
Price of seats according to the column:
1-5 = £200
6-9 = £150
9-14= £180
```

2. I created a separate file called "Booking information" to store the details that entered by user.

```
public void save() {
    String fileName = "Booking Information"+File.separator +getRowLetter() +""+getSeatNo() + ".txt";
    try {
        String folderPath = "Booking Information"; // Folder path
        File folder = new File(folderPath);

        // Check if folder doesn't exist, then create it
        if (!folder.exists()) {
            folder.mkdirs();
        }
}
```

You will need to demonstrate your understanding of the submitted code. Your tutor will arrange a coursework demonstration. During the coursework demonstration, your tutor will ask you to execute your program and questions on your code.

Failure to attend the demonstration will result in <u>0 for the coursework</u>.

3) Code:

1.w2051998_PlaneManagement.java

```
import java.util.InputMismatchException;
     import java.util.Scanner;
     import java.io.File;
     public class w2051998 PlaneManagement {
         public static int[][] seats = { //2D array
                 new int[14], new int[12], new int[12], new int[14] //This
         };
         public static void main(String[] args) {
             Tickets[][] tickets= new Tickets[4][14]; //This 2D array for
             System.out.println("\n<<<<Welcome to Plane Management
     System!!>>>>");
             System.out.println("\n");
             System.out.println("""
                     1-5 = £200
                     6-9 = £150
                     """);
             boolean terminate=false;
```

```
int menuSelection = menu();
      switch (menuSelection) { //here i use switch case to select
          case 0:
              terminate = true;
              System.out.println("Thank you for choosing
us.....Contact our team for more details"); //this for terminate the
              break;
              break;
          case 2:
              cancel seat(tickets);
              break;
          case 3:
              find first available();
              break;
          case 4:
              show seating plan();
              break;
          case 5:
              print ticket info(tickets);
              break;
              search ticket(tickets);
          default:
              System.out.println("Invalid option. Please try
again."); //If user input invalid data this message will be thrown.
  } while (!terminate);
   private static int menu() { //this menu() prints menu option for
        Scanner scanner = new Scanner(System.in);
        int menuSelection;
            System.out.println("\n");
            System.out.println("""
```

```
1) Buy a seat
                      6) Search tickets
                         ******
           System.out.println("Select your option (0-6): ");
           while (!scanner.hasNextInt()) { // here check if input
               System.out.println("Incorrect input. Please enter a
              scanner.next(); // Consume the invalid input
           menuSelection = scanner.nextInt();
           if (menuSelection < 0 || menuSelection > 6) {
               System.out.println("Incorrect input. Please enter a
number between 0 and 6.");
       } while (menuSelection < 0 || menuSelection > 6);
       return menuSelection;
   private static void buy seat(int[][] seats, Tickets[][]
tickets) {
       {Scanner scanner= new Scanner (System.in);
               System.out.println("Enter the row letter (A-D)");
               char rowLetter =
scanner.next().toUpperCase().charAt(0);//here we use char to get an
               int row = rowLetter - 'A'; /* Here we are subtract
```

```
System.out.println("Enter the seat number : ");
            int seatNo = scanner.nextInt();
            scanner.nextLine();
            if (seats[row][seatNo - 1] == 0) {//this condition
                seats[row][seatNo - 1] = 1;
                String name = "";
                while (name.trim().isEmpty()) {
                    System.out.println("Enter passenger's name: ");
                    name = scanner.nextLine();
                    if (name.trim().isEmpty()) {//if user skip to
                        System.out.println("Passenger's Name cannot
be empty.");
                String surname = "";
                while (surname.trim().isEmpty()) {
                    System.out.println("Enter passenger's surname:
");
                    surname = scanner.nextLine();
                    if (surname.trim().isEmpty()) {//if user skip to
                        System.out.println("Passenger's Surname
cannot be empty.");
                String email = "";
                while (email.trim().isEmpty()) {
                    System.out.println("Enter passenger's Email id:
                    email = scanner.nextLine();
                    if (email.trim().isEmpty()) {//if user skip to
                        System.out.println("Email cannot be
empty.");
```

```
Person newPerson = new
Person(name, surname, email); //here creating new object with user
                int price;
                if (seatNo <= 5 ) {</pre>
                    price= 200;
                }else if (seatNo <= 9) {</pre>
                    price = 150;
                }else{
                    price=180;
                Tickets newTickets = new Tickets( rowLetter, seatNo
, price, newPerson);
                tickets[row][seatNo - 1] = newTickets;
                newTickets.save();
                System.out.println("Your Ticket is booked. Thank
you...");
            } else {
                System.out.println("Sorry this ticket is already
booked...Try another seat to book");
        }catch
(InputMismatchException | ArrayIndexOutOfBoundsException e) {
            System.out.println("Your selection is invalid. Please
try again");
    private static void cancel seat(Tickets[][] tickets){
        {Scanner scanner= new Scanner (System.in);
            System.out.println("Enter the row letter (A-D)");
            char rowLetter = scanner.next().toUpperCase().charAt(0);
            int row = rowLetter - 'A';
            System.out.println("Enter the seat number : ");
            int seatNo = scanner.nextInt();
```

```
if (seats[row][seatNo - 1] == 1) {//this condition
                seats[row][seatNo - 1] = 0;
                System.out.println("Your booking is cancelled");
                tickets[row][seatNo - 1] = null; //this used to remove
                String fileName = rowLetter + "" + seatNo +".txt";
                File delefile = new File(fileName);
                delefile.delete();
            } else {
                System.out.println("This seat is not booked yet");
        }catch (InputMismatchException |
ArrayIndexOutOfBoundsException e) {
            System.out.println("Invalid input. Please try again");
    private static void find first available(){
        boolean available=false; //here this used to check if any
            for(int seatNO=0; seatNO<seats[row].length;seatNO++</pre>
                if (seats[row][seatNO]==0) {
                    char rowLetter = (char) (row +'A'); //here I
                    System.out.println("First available seats: row=
" + rowLetter +"\tSeat Number= "+ (seatNO + 1) );
                    available = true;
                    break;
            if (available) {//Exit outer loop once an available seat
```

```
break;
            if (!available) { // If no available seat is found after
                System.out.println("All Tickets are booked....");
   private static void show seating plan(){
        char rowLabel = 'A'; // Start with row label A
            System.out.print(rowLabel++ + ""); //print row label for
                for (int seat : seats[i]) { //here i used enhanced
                    if (seat == 0) {
                        System.out.print(" 0 ");// Print '0' to
                    } else {
                        System.out.print(" X ");// Print 'X' to
                System.out.println();// Move to the next line after
   private static void print ticket info(Tickets[][] tickets){
        int totalprice = 0;//here initializing the total price
        for(int row=0; row< tickets.length; row++) {// Iterate over</pre>
            for (int seatNO = 0; seatNO < seats[row].length;</pre>
seatNO++) {
                if (tickets[row][seatNO] != null) {
                    tickets[row][seatNO].TicketDetails();// Print
                    totalprice = totalprice +
tickets[row][seatNO].getPrice();// Add the ticket price to the total
```

```
System.out.println("\n");
        System.out.println("Total price is : f" + totalprice);//here
    private static void search ticket(Tickets[][] tickets) {
        Scanner scanner = new Scanner(System.in);
            System.out.println("Enter the row letter (A-D)");
            char rowLetter = scanner.next().toUpperCase().charAt(0);
            int row = rowLetter - 'A';
            System.out.println("Enter the seat number : ");
            int seatNo = scanner.nextInt();
            if (tickets[row][seatNo - 1] != null) {// Check if a
                tickets[row][seatNo - 1].TicketDetails();// Print
            } else {
                System.out.println("This seat is not booked. You can
book this seat");
        } catch (InputMismatchException |
ArrayIndexOutOfBoundsException e) { // Catch exceptions for invalid
            System.out.println("Invalid input. Please try again");
            scanner.nextLine();
```

Person.java

```
public class Person {
   private String name;//here stores passenger's name
   private String surname;//here stores passenger's surname
   private String email;//here stores passenger's email
   public Person(String name, String surname, String email) {
        this.name= name;// Initialize name attribute
        this.surname = surname; // Initialize surname attribute
        this.email= email;// Initialize email attribute
   public String getName() {
   public String getSurname() {
   public String getEmail(){
   public void setName(String name) {
   public void setSurname(String surname) {
       this.surname = surname;
   public void setEmail(String email){
        this.email = email;
```

Tickets.java

```
import java.io.FileWriter;
import java.io.IOException;
import java.io.File;
public class Tickets {
   private Person person; // Stores the person associated with the
   public Tickets(char rowLetter, int seat, int price, Person
person) {
        this.rowLetter = rowLetter; // Initialize rowLetter attribute
        this.seatNo = seat;// Initialize seatNo attribute
        this.price = price;// Initialize price attribute
        this.person = person;// Initialize person attribute
    public Tickets(char rowLetter, int seatNo, int price) {
    public char getRowLetter() {
```

```
public int getSeatNo() {
   public int getPrice() {
   public Person getPerson() {
       return this.person;
   public void setRowLetter(char rowLetter) {
        this.rowLetter = rowLetter;
   public void setSeatNo(int seatNO) {
        this.seatNo = seatNO;
   public void setPrice(int price) {
       this.price = price;
   public void setPerson(Person person) {
       this.person = person;
   public void TicketDetails() { //By this going to disply ticket
       System.out.println("Passenger Ticket Information " +
                "\n\tRow: " + getRowLetter()+
                "\n\tPrice: f" + getPrice() );
       person.personDetail();
   public void save() {//this method is used to save the ticket
       String fileName = "Booking Information"+File.separator
+getRowLetter() +""+getSeatNo() + ".txt";//here I define the path
```

```
String folderPath = "Booking Information";
           File folder = new File(folderPath);
           if (!folder.exists()) {
               folder.mkdirs();
           FileWriter file = new FileWriter(fileName); //Here i
----\n");
           file.write("\tTicket information of seat booked\n");
           file.write("------
----\n");
           file.write("\backslash n");
           file.write("\tRow: " + getRowLetter() + "\n"+ "\tSeat
Number: " + getSeatNo() +"\n");
           file.write("\tPrice: full + getPrice() + "\n");
           file.write("\n-----Passenger's Information----
    ---\n");
            file.write("\n");
            file.write("\tName of Passenger: " + person.getName()+
           file.write("\tPassenger's Surname: " +
person.getSurname() + "\n");
           file.write("\tPassenger's E-mail Id: " +
person.getEmail() + "\n");
            file.close();// Close the FileWriter object
        } catch (IOException e) {
           System.out.println("Error occurred");
```