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CS 3331 – Advanced Object-Oriented Programming – Spring 2023

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PA4

This work was done individually and completely on my own. I did not share, reproduce, or alter any part of this assignment for any purpose. I did not share code, upload this assignment online in any form, or view/received/modified code written from anyone else. All deliverables were produced entirely on my own. This assignment is part of an academic course at The University of Texas at El Paso and a grade will be assigned for the work I produced.

1. Program Explanation

In PA4, I added new user interaction and customer/employee menu options to my flight booking program. The main feature added was the implementation of a dynamically read file that creates objects from provided data files by creating a HashMap with the indexes of where words are and placing them in the corresponding place within the object as well as an Automatic Ticket Purchasing Feature and another menu option to view information regarding airports. I also added functionality to purchase tickets for employees and introduced fees such as security fees, minor airline fees, and standard sales taxes. Additionally, I made the code more modular and separated the main method into different void methods within the main file to print the menu options. As a result, the code looks much cleaner and well-organized.

2. What did I learn?

During PA4, I gained valuable experience in improving user interaction functionality, updating customer and employee role objects, and implementing features such as ticket purchasing, a new way to handle cancellation, and refunds. I also learned how to log actions to a separate file to track program actions. To improve my program further, I plan to simplify complex and lengthy code blocks into more manageable and readable sections of code. I will add more documentation throughout the program to improve its overall readability and understandability and have already started adding Javadoc throughout the program. Additionally, I will focus on adding more error handling and input validation to prevent potential issues and ensure the program runs smoothly, which again I have added but there may be some exceptions I haven't caught. Lastly, I will conduct more rigorous testing to identify and resolve any lingering bugs. I found that using HashMaps and multiple files to form one program was helpful in organizing my code better and optimizing the usage of functions. I also learned that separating one big menu into smaller submenus helps with readability.,

3. Design

This program simulates a flight booking system and requires students to modify or add to existing code developed since PA0. I followed the assignment guidelines to create a program that offers a seamless user experience while minimizing input exceptions. The program utilizes multiple HashMaps as the primary data structure to manage important objects from CSV files, such as tickets and objects created during customer and employee ticket purchases. I followed the assignment instructions, however I did make the assumption that employees do not have the

option to cancel their own tickets. The purpose of this lab report is to document improvements made to the program's functionality, specifically in the areas of customer and employee role functionalities and user interactions. These updates aimed to enhance the program's usability and effectiveness in managing flight reservations. While the program is not yet fully refined and polished, it is satisfactory and provides a good user experience.

4. Testing

During testing, I conducted thorough testing by inputting values for various scenarios I anticipated and ensured that my program could handle them efficiently. Although I did not create standardized tests, my testing was for the most part rigorous, and I was able to verify that my program worked in most scenarios. In addition to white-box testing, I experimented with the use of test cases performed on multiple functions present within my project.

5. Test results

I added new search functionality for customers, allowing them to search for flights by origin/destination airport codes. I also added airport functionality to employees, enabling them to inquire about airport information by airport code. Additionally, I added automatic purchasing functionality for employees using the "Autopurchase.csv" file. These new features performed as expected during my testing. I plan to continue to refine and improve my code by identifying and addressing any potential issues as they arise.

```
Please make your selection: 2
Please enter the ID of the flight that you would like to cancel: 1
Exception in thread "main" java.lang.NullPointerException: Cannot invoke "Customer.getTotalMoney()" because the return value of "java.util.HashMap.get(Object)" is null
    at FlightRunner.cancelTicketsForFlight(FlightRunner.java:781)
    at FlightRunner.cancelTicketMenu(FlightRunner.java:232)
    at FlightRunner.employeeMenu(FlightRunner.java:1021)
    at FlightRunner.main(FlightRunner.java:1073)
sethrodriguez@Seths-MacBook-Pro pa4-igeeekoutz %

Here are the following menu options
1. View a Flights information
2. Purchase Tickets
3. Cancel a ticket
4. View Tickets
5. Go Back
4

Here are all your tickets:
Ticket for flight number: 1
Ticket Type: Main Cabin
Seats Purchased: 1
Ticket Total: 612.80165625
Confirmation Number: 1

To go back to log in screen type 'return' otherwise enter any character: 
```

Flight ID: 91
Origin Airport: ELP
Destination Airport: DFW
Departure Date: 3/24/2023
Departure Time: 5:30 AM
Arrival Date: 3/24/2023
Arrival Time: 8:04 AM
Duration: 94
Distance: 551
Time Zone Difference: 1
First Class Price: 2852
Business Class Price: 664
Main Cabin Price: 355
First Class Seats: 9
Business Class Seats: 44
Main Cabin Seats: 85
Total Seats: 138

Flight ID: 92
Origin Airport: ELP
Destination Airport: DFW
Departure Date: 3/24/2023
Departure Time: 8:25 AM
Arrival Date: 3/24/2023
Arrival Time: 10:59 AM
Duration: 94
Distance: 551
Time Zone Difference: 1
First Class Price: 3390
Business Class Price: 611
Main Cabin Price: 484
First Class Seats: 14
Business Class Seats: 54
Main Cabin Seats: 85
Total Seats: 153

Flight ID: 93
Origin Airport: ELP
Destination Airport: DFW
Departure Date: 3/24/2023
Departure Time: 12:10 PM
Arrival Date: 3/24/2023
Arrival Time: 2:44 PM
Duration: 94
Distance: 551
Time Zone Difference: 1
First Class Price: 3121
Business Class Price: 715
Main Cabin Price: 375
First Class Seats: 8
Business Class Seats: 57
Main Cabin Seats: 90
Total Seats: 155

Would you like to purchase a ticket for any of these flights?

1. Yes
2. No

PLEASE WRITE DOWN THE FLIGHT ID YOU'D LIKE TO BUY TICKETS FOR BEFORE MOVING ON

```
Added $9.15 MinerAirlinesFee to transaction
Added $5.60 Security Fee to transaction
Added Texas Taxes (8.25%) to total

User is not a Miner Airlines Member, 5% discount not added.

Added $9.15 MinerAirlinesFee to transaction
Added $5.60 Security Fee to transaction
Added Texas Taxes (8.25%) to total

User is not a Miner Airlines Member, 5% discount not added.

Added $9.15 MinerAirlinesFee to transaction
Added $5.60 Security Fee to transaction
Added Texas Taxes (8.25%) to total

User is a Miner Airlines member, 5% discount has been added

Added $9.15 MinerAirlinesFee to transaction
Added $5.60 Security Fee to transaction
Added Texas Taxes (8.25%) to total

User is a Miner Airlines member, 5% discount has been added

Added $9.15 MinerAirlinesFee to transaction
Added $5.60 Security Fee to transaction
Added Texas Taxes (8.25%) to total

User is a Miner Airlines member, 5% discount has been added

As an employee you have access to the following menu options:
1. View Flight Information by ID
2. Cancel flights
3. Purchase Tickets
4. View Airport Information by Airport Code
5. Automatic Ticket Purchasing
6. Go Back to Log In Screen

Please make your selection: █
As an employee you have access to the following menu options:
1. View Flight Information by ID
2. Cancel flights
3. Purchase Tickets
4. View Airport Information by Airport Code
5. Automatic Ticket Purchasing
6. Go Back to Log In Screen

Please make your selection: 5

Welcome to the Automatic ticket purchaser, there are 3 options

1. AutoPurchaser10k
2.AutoPurchaser100k
3.AutoPurchaser400k
4. Go Back

1█
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Please enter your selection: a
Please enter the flight that you would like to see inquire about: 1
Invalid menu option
As an employee you have access to the following menu options:
1. View Flight Information by ID
2. Cancel flights
3. Purchase Tickets
4. View Airport Information by Airport Code
5. Automatic Ticket Purchasing
6. Go Back to Log In Screen

Please make your selection: 3
What Flight would you like to purchase Tickets for?
There are 3 types of tickets available, First Class, Business Class and Main Cabin
1. First Class Price: $1745 Seats available: 14
2. Business Class Price: $618 Seats available: 54
3. Main Cabin Price: $528 Seats available: 98
Total money available: 5238.47

What type of ticket you would like to purchase?:
3
How many Main Cabin Tickets would you like to purchase?
1
As an Employee of MinerAirlines you get 75% off your Main Cabin Ticket Purchase.

Added $9.15 MinerAirlinesFee to transaction
Added $5.60 Security Fee to transaction
Added Texas Taxes (8.25%) to total

User is a Miner Airlines member, 5% discount has been added
Your total comes out to: 1073.76303125 Would you like to proceed?
1. Yes
2. No
1
Thank you for your purchase

Here is your ticket information:
Ticket is active: true
Ticket associated to user: sethrodriguez
Tickets for Flight Number: 2
Ticket type: Main Cabin
Number of seats purchased: 1
Amount paid: 1073.76303125
As an employee you have access to the following menu options:
1. View Flight Information by ID
2. Cancel flights
3. Purchase Tickets
4. View Airport Information by Airport Code
5. Automatic Ticket Purchasing
6. Go Back to Log In Screen

Please make your selection: 4
Here you may view Airport Information by airport code, to begin please enter an Airport code
Airport Code: ELP
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Airport Code: ELP
Airport Name: El Paso International Airport
Airport City: El Paso
Airport State: Texas
Airport Country: United States
Airport Fees: 3.5
Lounge Status: false
-----
Would you like to see the information for another Airport?
1. Yes
2. No

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Please enter your password: Fun!23
Log in succesful

=====
Would you like to continue your session?

1. Yes
2. No

1
As an employee you have access to the following menu options:
1. View Flight Information by ID
2. Cancel flights
3. Purchase Tickets
4. View Airport Information by Airport Code
5. Automatic Ticket Purchasing
6. Go Back to Log In Screen

Please make your selection: 1

1. View Flight Information
2. View total number of seats remaining
3. View first class seats remaining
4. View business class seats remaining
5. View main cabin seats remaining
6. Inquire list of customer
7. Compute amount collected from frist class seats
8. Compute amount collected from Business Class Seats
9. Compute amount collected from Main Cabin Seats
10. Compute amount collected from all seats sold
11. Compute the total profit expected for the flight
12. View total Security Fee collected for flight
13. View Total MinerAirlinesFee Collected for flight
14. View Total tax collected for the flight

Please enter your selection: a

Please eneter the flight that you would like to see inquire about: 1

Invalid menu option
As an employee you have access to the following menu options:
1. View Flight Information by ID
2. Cancel flights
3. Purchase Tickets
4. View Airport Information by Airport Code
5. Automatic Ticket Purchasing
6. Go Back to Log In Screen

Please make your selection: 1
Invalid menu option, you may proceed.

Client is not a customer.
First or Last name entered do not match up with username, please make sure you enetered the information correctly.
First Name: Seth

Last Name: Rodriguez

Client is not a customer.
First and Last name associated with username match up, you may proceed.

Please enter your password: 1
Hello and welcome to MinerAir, to get started please enter your first and Last name.

First Name: s
Last Name: r

Thank you s r, now please enter your username and password.

Username: sethr
The username you entered was invalid please try again: 1

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6. Code Review

After completing my code, I carefully reviewed the instructions for PA and other provided documents to ensure that I included all necessary functionalities and made required changes. However, I acknowledge that my code may not handle all exceptions gracefully. Still, I'm confident that my skills will improve as the class progresses, and I plan to dedicate more time to studying the code to make it more robust and efficient. In addition to self-study, I intend to seek feedback from peers and instructors to identify areas for improvement. I'm excited to continue learning and improving my coding skills in this class.