Flight Booking System

1 DESCRIPTION OF THE TASK

- Swing-based GUI
    - either a menu bar and one of the classes: JTable, JTree, JComboBox
    - or using low-level graphics routines (Graphics class)
- Collections framework
- File output and input using Java serialization
- Unit tests (JUnit)

2 PROJECT DESCRIPTION

The Objective of the project was to create a ’Flight Booking System’ interface which will show the user real time quotes of flights between 2 destinations.

The users could book the desired flights after comapring the prices among all the options.

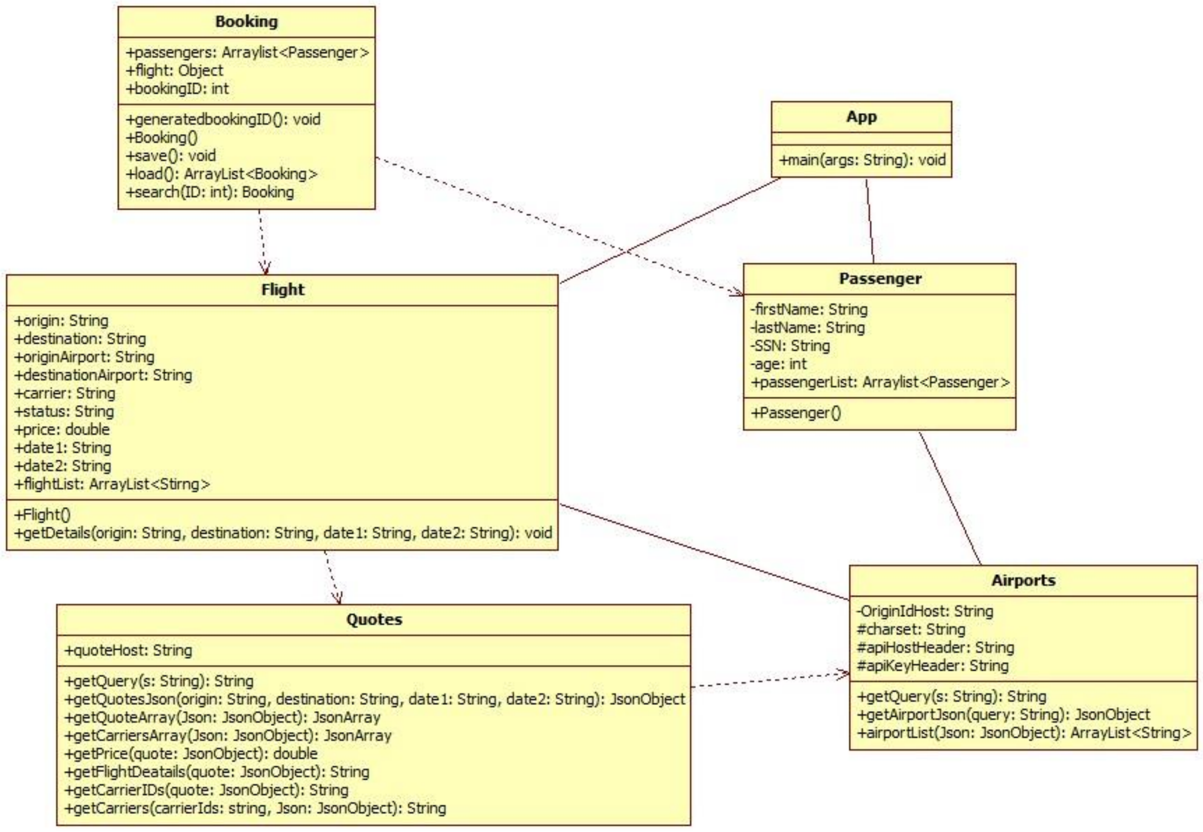
The Flight Details included the Name of the Airline, Origin and Destination airports,Price of 1 passenger and information whether the flight is Direct or Not.

The user can also search for their previous booking by using the Booking ID generated at the end of Each booking.

3 Structural Description

The Project was done with the help of the SkyScanner API for live flight data.

The Data from th API was in JSON form and needed to parsed to get all the required details from the website. The HTTP response has to be dealt with by using the Unirest dependency which has been added as a Maven Dependency via the POM XML file.


Booking
+passengers: Arraylist<Passenger>
+flight: Object
+bookingID: int
+generatedbookingID(): void
+Booking()
+save(): void
+load(): ArrayList<Booking>
+search(ID: int): Booking
App
+main(args: String): void
Flight
+origin: String
+destination: String
+originAirport: String
+destinationAirport: String
+carrier: String
+status: String
+price: double
+date1: String
+date2: String
+flightList: ArrayList<Stirng>
+Flight()
+getDetails(origin: String, destination: String, date1: String, date2: String): void
Passenger
-firstName: String
-lastName: String
-SSN: String
-age: int
+passengerList: Arraylist<Passenger>
+Passenger()
Quotes
+quoteHost: String
+getQuery(s: String): String
+getQuotesJson(origin: String, destination: String, date1: String, date2: String): JsonObject
+getQuoteArray(Json: JsonObject): JsonArray
+getCarriersArray(Json: JsonObject): JsonArray
+getPrice(quote: JsonObject): double
+getFlightDeatails(quote: JsonObject): String
+getCarrierIDs(quote: JsonObject): String
+getCarriers(carrierIds: string, Json: JsonObject): String
Airports
-OriginIdHost: String
#charset: String
#apiHostHeader: String
#apiKeyHeader: String
+getQuery(s: String): String
+getAirportJson(query: String): JsonObject
+airportList(Json: JsonObject): ArrayList<String>

3.1 Booking

Responsibilities

The Class contains all the data required for a Flight ticket booking got be made

Attributes

+passengers: Arraylist<Passenger>	Contains a list of all the passengers
+flight: Object	The Flight Chosen by the User
+bookingID: int	The Booking ID

Methods

+Booking()	Sets the Values needed for the Booking
+save():void	Serializes all Booking Objects and writes/appends them to a txt file
+load():ArrayList<Booking>	Reads all the Booking objects from the Txt file and stores them In an ArrayList for searching before returning the list
+search(ID:int):Booking	Calls the load() function and searches the list for the same Booking ID returns the Object if found otherwise creates ad returns a Booking Object with BookingID == 0
+generateBookingID():void	Generates a Random 6 digit long integer which acts as the Booking confirmation ID

3.2 AIRPORTS

Responsibilities

Gets the HTTP response from the API and parses throught he JSON to find the names and number of the airports in the origin and destination

Attributes

-originIdHost:String	The link to the API for getting the names of Airports
#charset:String	Character set
-apiHostHeader:String	Header for accessing JSON
-apiKeyHeader:String	Header for accessing JSON

Methods

+getQuery(s: String): String	function to convert charset to Unicode and takes parameter
+getAirportJson(query: String): JsonObject	gets the Json from the API
+airportList(Json: JsonObject): ArrayList<String>	Puts the airport names in a new list after removing the quotations

3.3 FLIGHT

Responsibilities

The Class creates a list of all the Flights going from all the airports from the origin to the destination airports

Attibutes

+origin:String	Name of Origin
+destination:String	Name of Destination
+originAirport:String	Code of origin airport
+destinatonAirport:String	Code of destination airport
+carrier:String	Name of airline
+status:String	Direct or Indirect flight
+price:double	Cost of ticket
+date1:String	Date of Departure
+date2:Strinng	Date od Arrival
+flightList:ArrayList<Flight>	List of al the Flights

Methods

+getDetails(origin: String, destination: String, date1: String, date2: String): void	Goes through the API functions to get all the required details of the flight
+Flight()	Constructor

3.4 Passenger

Responsibilities

Stores all the details of the passengers

Attributes

-firstName:String	First name of the passenger
-lastName:String	Last name of the passenger
-SSN:String	Social Security Number of the Passenger
-age:int	Age of the Passenger
+passengerList:ArrayList<Passenger>	The list of all Passengers

Methods

+Passenger()	Constructor

3.5 Quotes

Responsbilities

Gets the HTTP response from the API and parses the JSON to find all the data required for a flight

Attributes

-quotesHost:String	host for getting the flight quotes

Methods

+getQuery(s: String): String	converts the given String to Unicode for passing in the response
+getQuotesJson(origin: String, destination: String, date1: String, date2: String): JsonObject	Gets the JSON from the API
+getQuoteArray(Json: JsonObject): JsonArray	Gets the Quotes array from the Json
+getCarriersArray(Json: JsonObject): JsonArray	gets the carriers from Json
+getPrice(quote: JsonObject): double	gets the price from each quote
+getFlightDeatails(quote: JsonObject): String	gets whether the flight is direct or not
+getCarrierIDs(quote: JsonObject): String	gets a list of all the carriers/flights ids that are in a quote
+getCarriers(carrierIds: string, Json: JsonObject): String	gets a list of the names of the flight carriers for a trip

3.6 APP

Responsibilities

The Class consists of the MainWindow object call which will launch the GUI application

Methods

+Main()	Starts the Program

3.2CLASS DIAGRAM

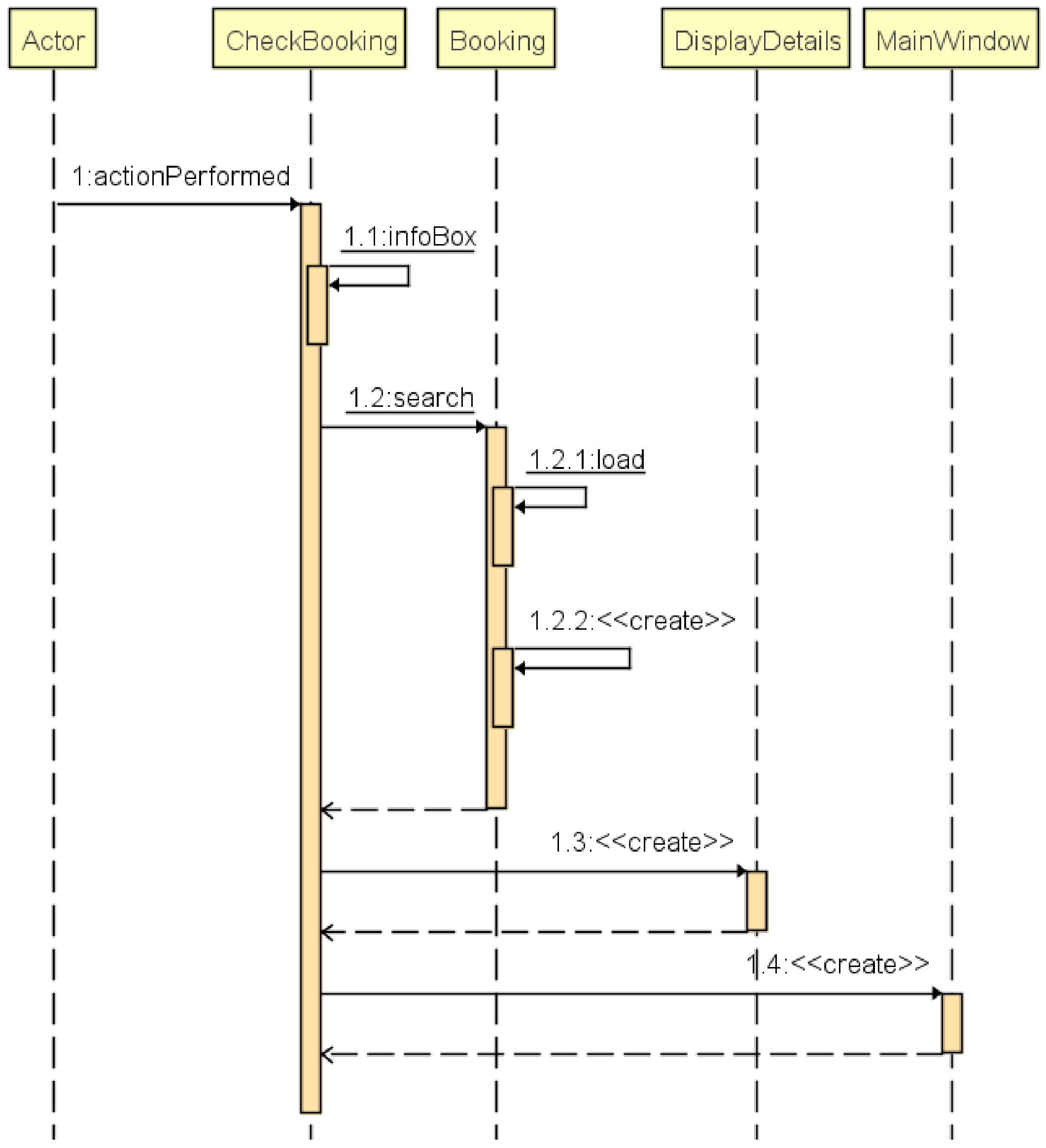
<insert the Class Diagram here>

4 BEHAVIORAL DESCRIPTION

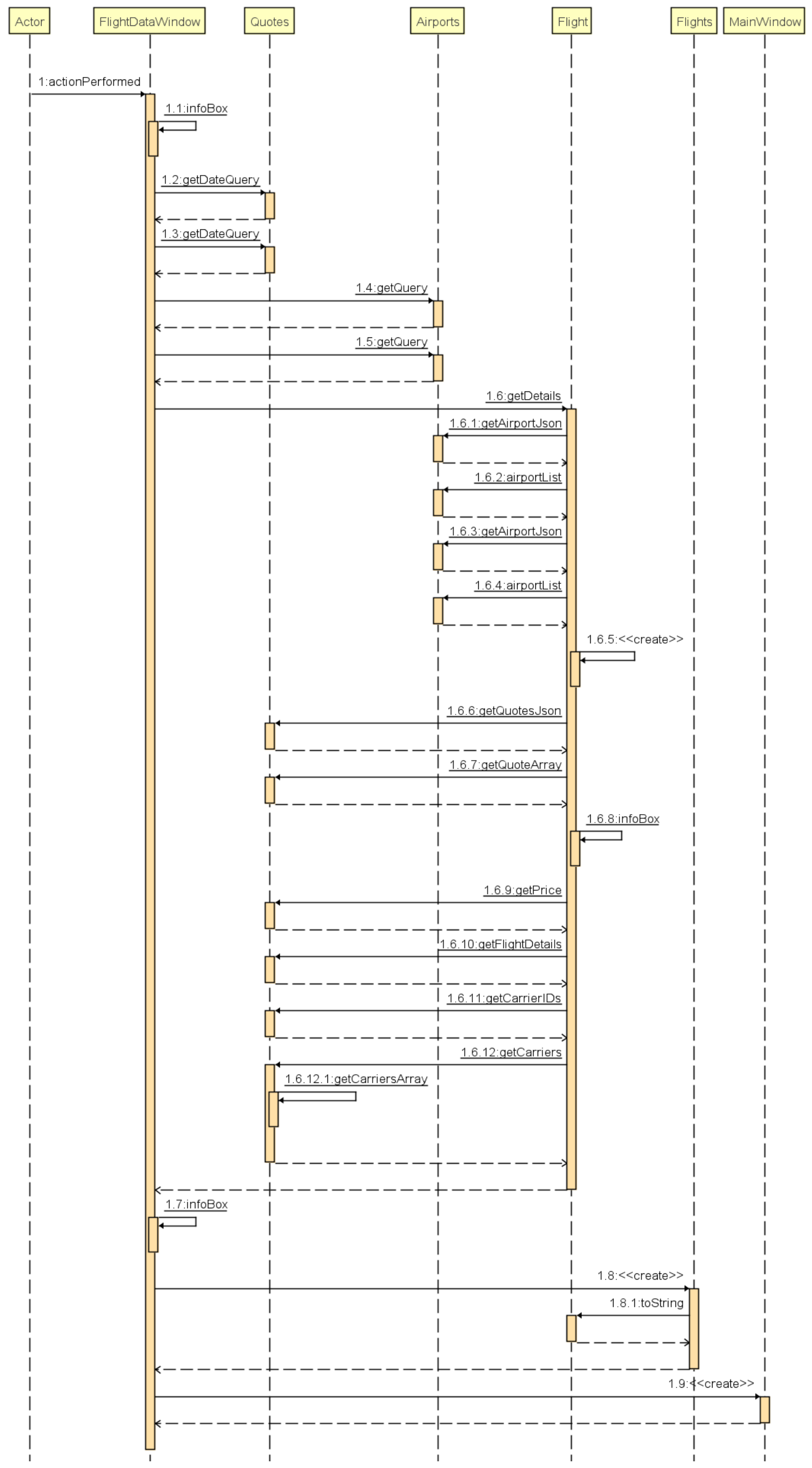
4.1 SEQUENCE DIAGRAMS

4.1.1 CheckBooking ActionListener

The CheckBooking Actoin Listener invokes a search throught the Serialized for the Booking ID which has been inuputted

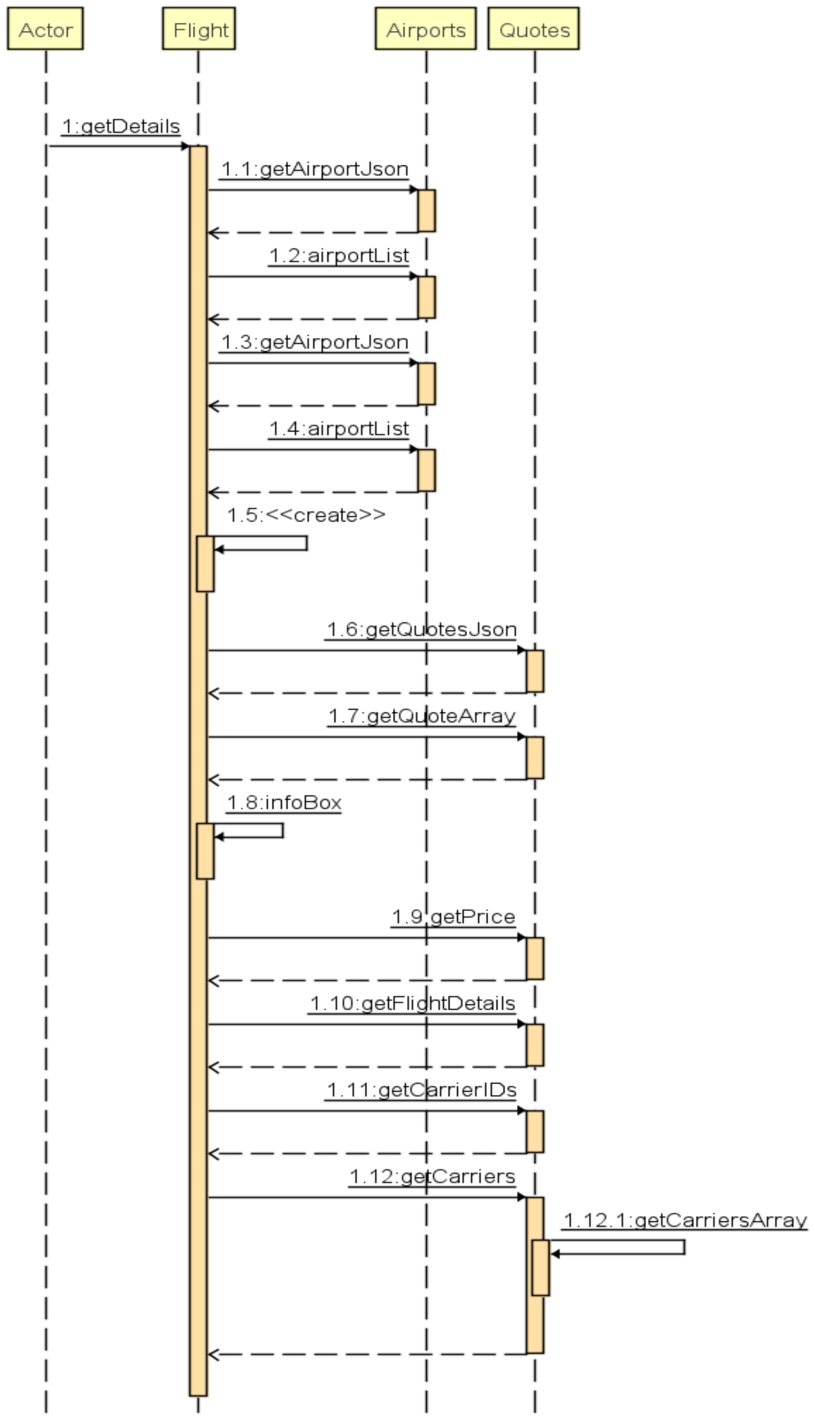


4.1.2 Flight ActionListener

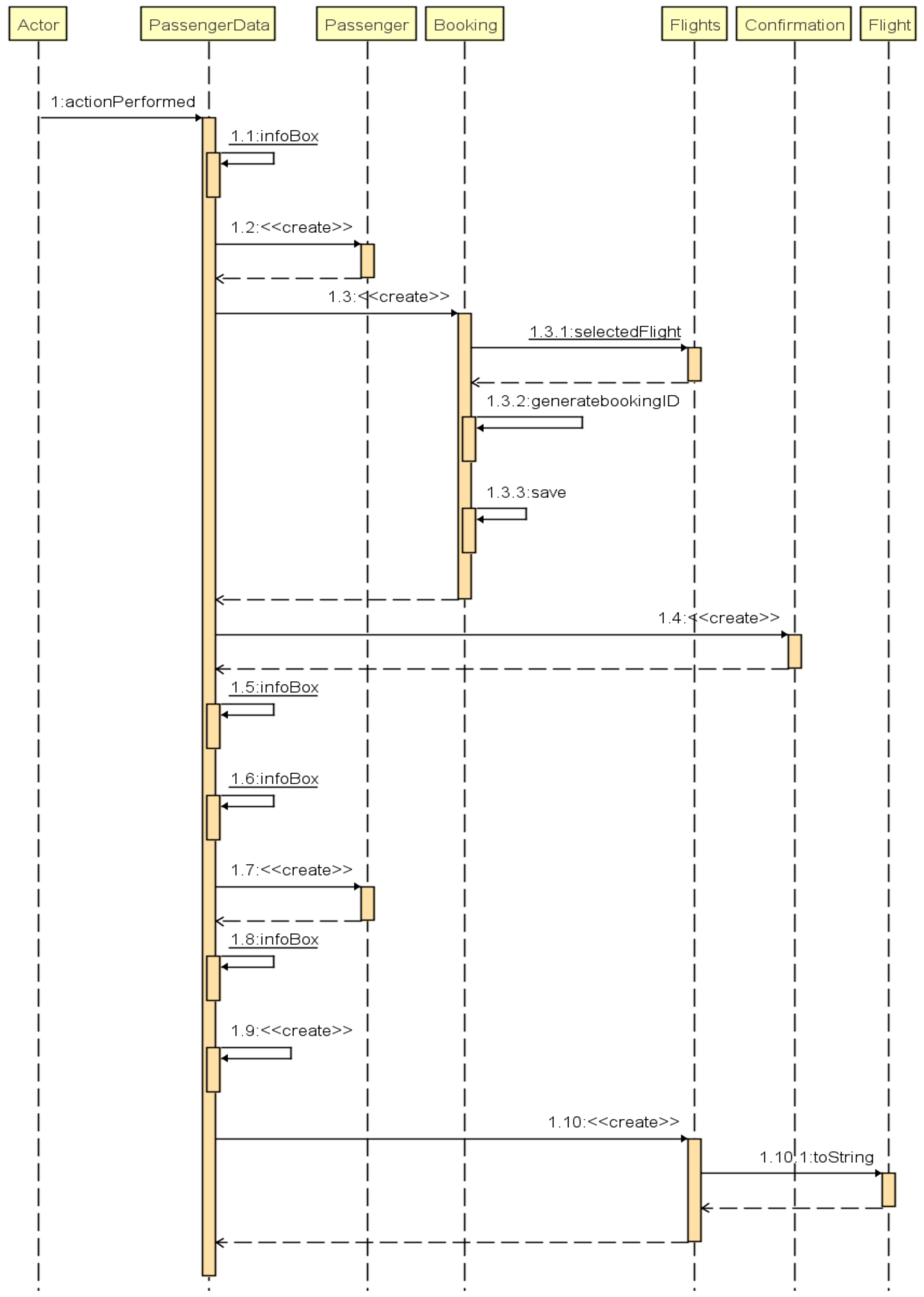


4.1.3 Get Flight Details

Gathers all the information of the flight and adds the flights to the list

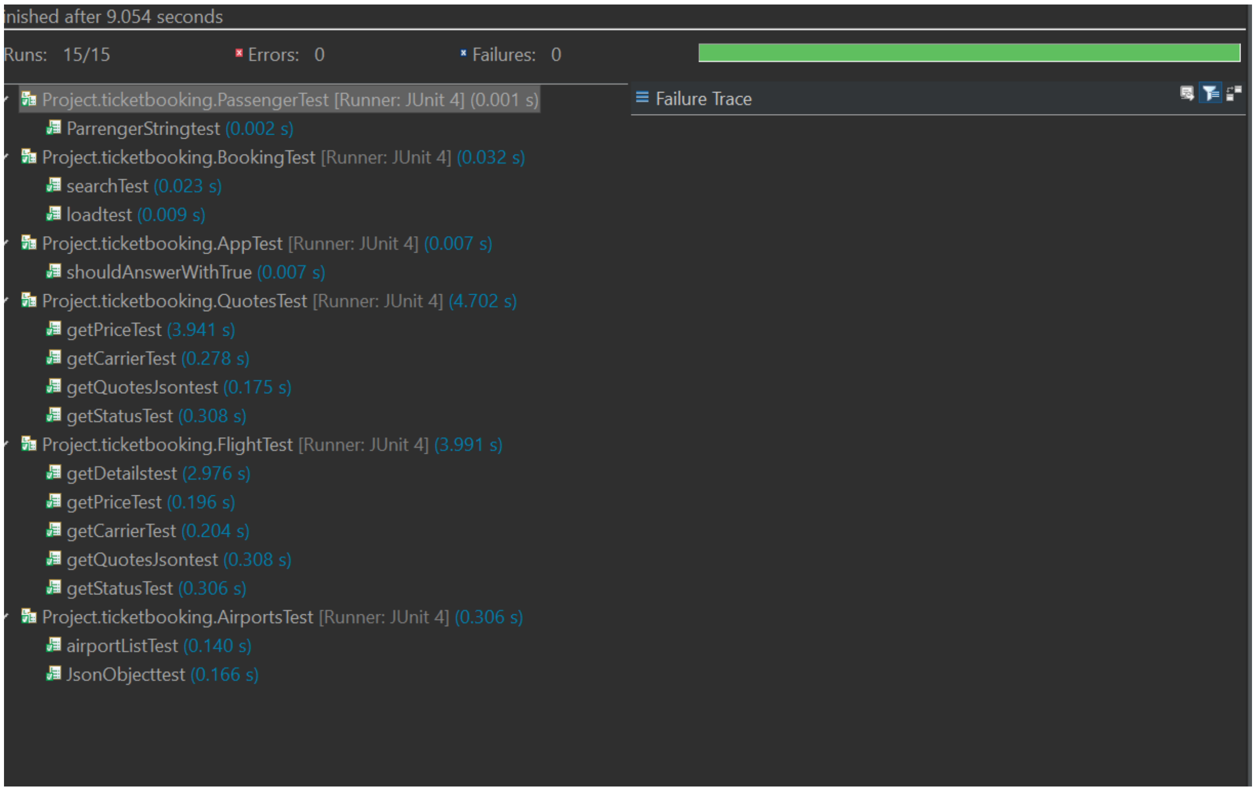


4.1.4 Passenger Action Listener



5 JUNIT TEST CASES

5.1 Overview



```
inished after 9.054 seconds
Runs:   15/15          Errors:   0          Failures:   0

Project.ticketbooking.PassengerTest [Runner: JUnit 4] (0.001 s)
    ParrengerStringtest (0.002 s)
Project.ticketbooking.BookingTest [Runner: JUnit 4] (0.032 s)
    searchTest (0.023 s)
    loadtest (0.009 s)
Project.ticketbooking.AppTest [Runner: JUnit 4] (0.007 s)
    shouldAnswerWithTrue (0.007 s)
Project.ticketbooking.QuotesTest [Runner: JUnit 4] (4.702 s)
    getPriceTest (3.941 s)
    getCarrierTest (0.278 s)
    getQuotesJsontest (0.175 s)
    getStatusTest (0.308 s)
Project.ticketbooking.FlightTest [Runner: JUnit 4] (3.991 s)
    getDetailstest (2.976 s)
    getPriceTest (0.196 s)
    getCarrierTest (0.204 s)
    getQuotesJsontest (0.308 s)
    getStatusTest (0.306 s)
Project.ticketbooking.AirportsTest [Runner: JUnit 4] (0.306 s)
    airportListTest (0.140 s)
    JsonObjecttest (0.166 s)
```

5.2 Test Cases

5.2.1 JsonObjecttest()

Description	Tests whether the API is return
Behavior	Tests the getAirportJson() function by passing the value ”Budapest” and checks the return of an JsonObject

5.2.2 airportListTest()

Description	Test the airportList() function
Behavior	Tests whether the function returns a value when “Budapest” has been passed as a value

5.2.3 loadtest()

Description	Test the load() function
Behavior	Tests whether the De-Serialization function works properly and adds values to the booking list

5.2.4 searchTest()

Description	Tests the search() function
Behavior	Uses the value ‘907477’ as a Booking Id and checks whether the function can find a match in the list

5.2.5 getDetailsCheck()

Description	Tests the getDetails() function

Behavior	Passes the values
	Origin = “Budapest”
	Destination = “London”
	Date1 = ‘2020-12-21’
	Date = ‘2021-01-13’
	And check whether there is an output with the flights being added to the flight list

5.2.6 PassengeStringtest()

Description	Tests the toString function in Passenger
Behavior	Compares a pre-set string to the one generated by the function

5.2.7 getQuotesJson()

Description	Test the getQuotesJson function
Behavior	Finds whether the value returned from the API is a JsonObject or not

5.2.8 getCarrierTest()

//MAY CHANGE DUE TO LIVE QUOTES

Description	Tests the getCarrier function
Behavior	Test the whether the name of the Carrier is same .

5.2.9 getPriceTest()

Description	Test the getPrice
Behavior	Test whether the price has changed

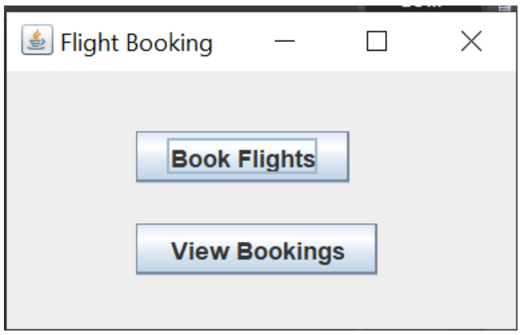
5.2.10 getStatusCheck()

Description	Test whether the flight is direct or not
Behavior	Detects status

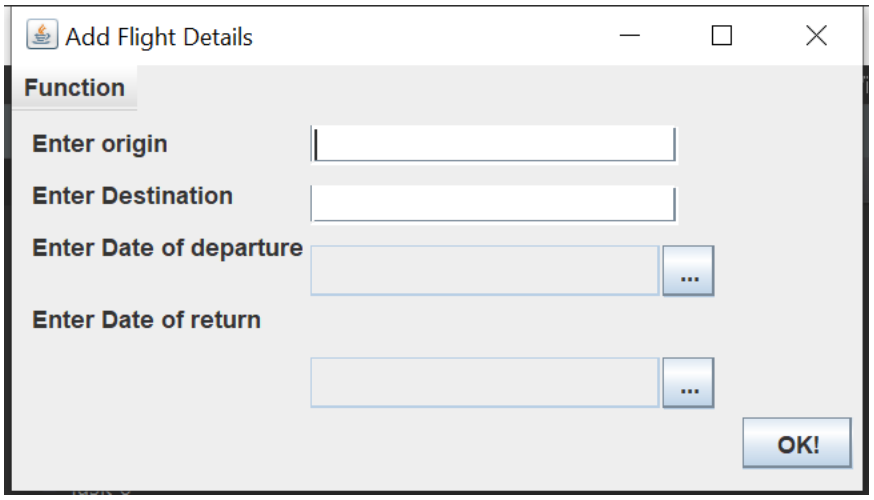
6 GUI

The Swing Graphical User Interface was implemented by using 7 classes for each of the windows:

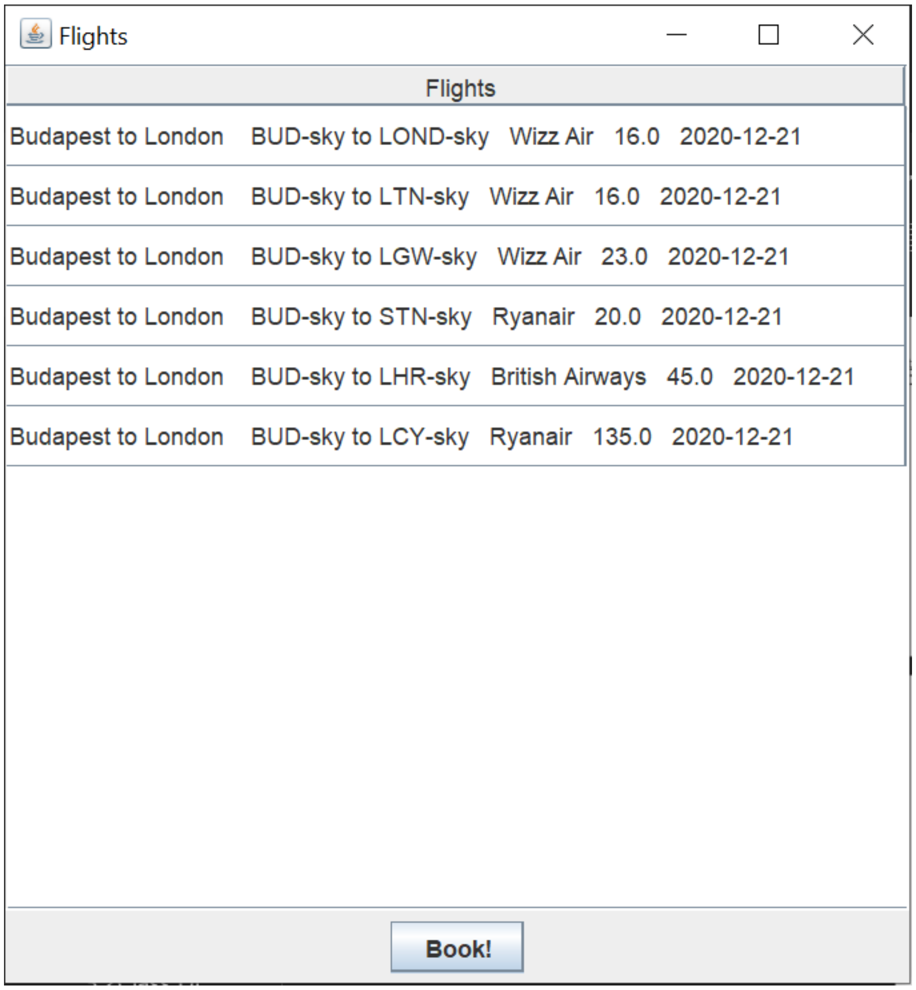
6.1 MainWindow.java



6.2 FlightDataWindow.java

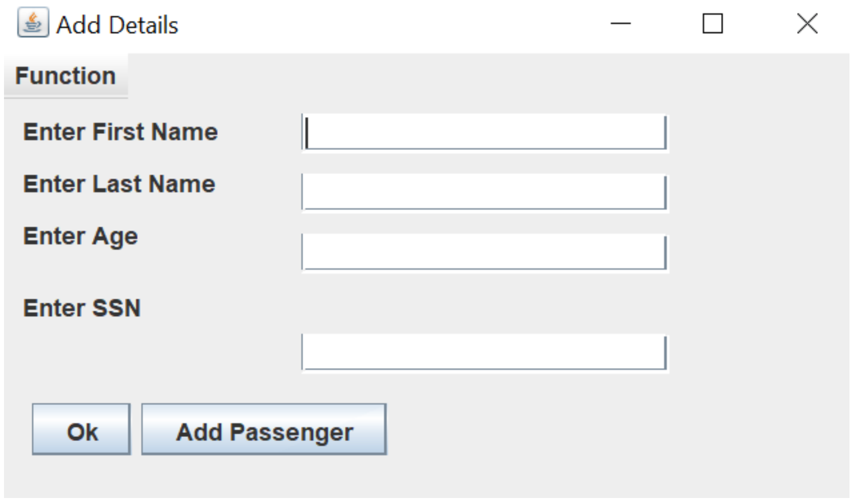


6.3 FLIGHTS.JAVA

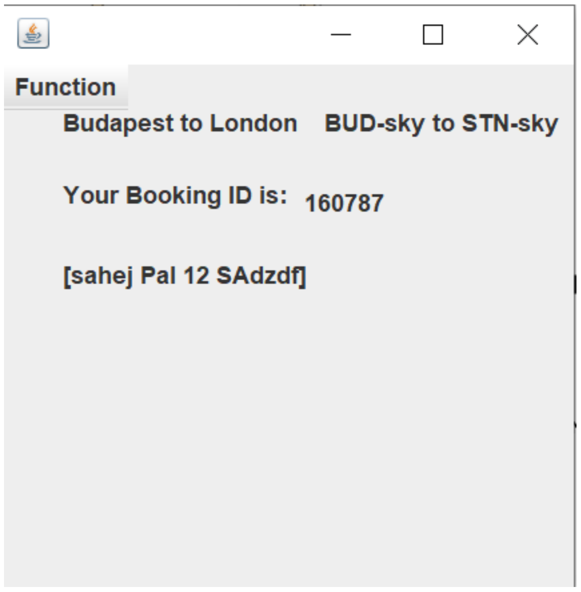


```
Flights
Budapest to London   BUD-sky to LOND-sky   Wizz Air   16.0   2020-12-21
Budapest to London   BUD-sky to LTN-sky   Wizz Air   16.0   2020-12-21
Budapest to London   BUD-sky to LGW-sky   Wizz Air   23.0   2020-12-21
Budapest to London   BUD-sky to STN-sky   Ryanair   20.0   2020-12-21
Budapest to London   BUD-sky to LHR-sky   British Airways   45.0   2020-12-21
Budapest to London   BUD-sky to LCY-sky   Ryanair   135.0   2020-12-21
```

6.4 PASSENGERDATA.JAVA



6.5 CONFIRMATION.JAVA

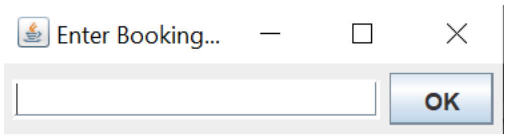


Budapest to London BUD-sky to STN-sky

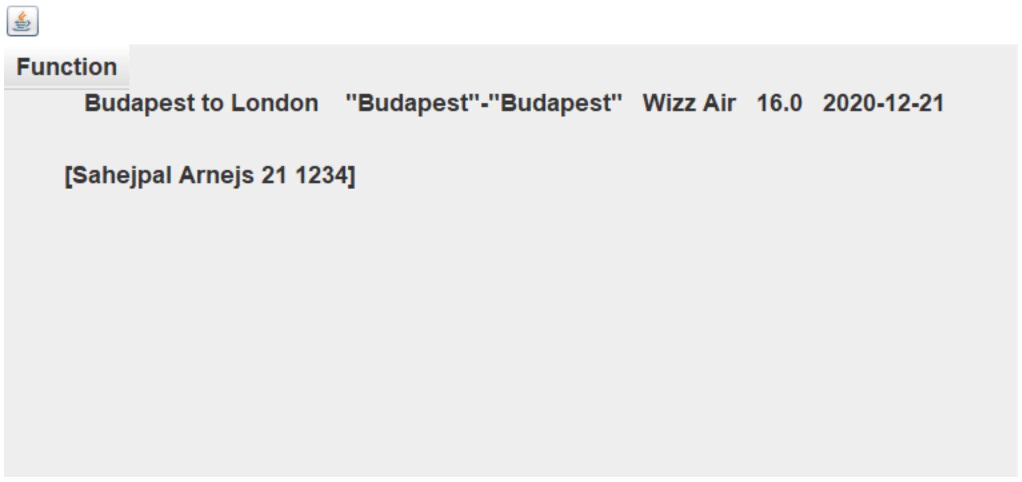
Your Booking ID is: 160787

[sahej Pal 12 SAdzdf]

6.6 CHECKBOOKING.JAVA



6.7 DISPLAYDETAILS.JAVA



Budapest to London "Budapest"-"Budapest" Wizz Air 16.0 2020-12-21

[Sahejpal Arnejs 21 1234]