CT2106 Assignment 4

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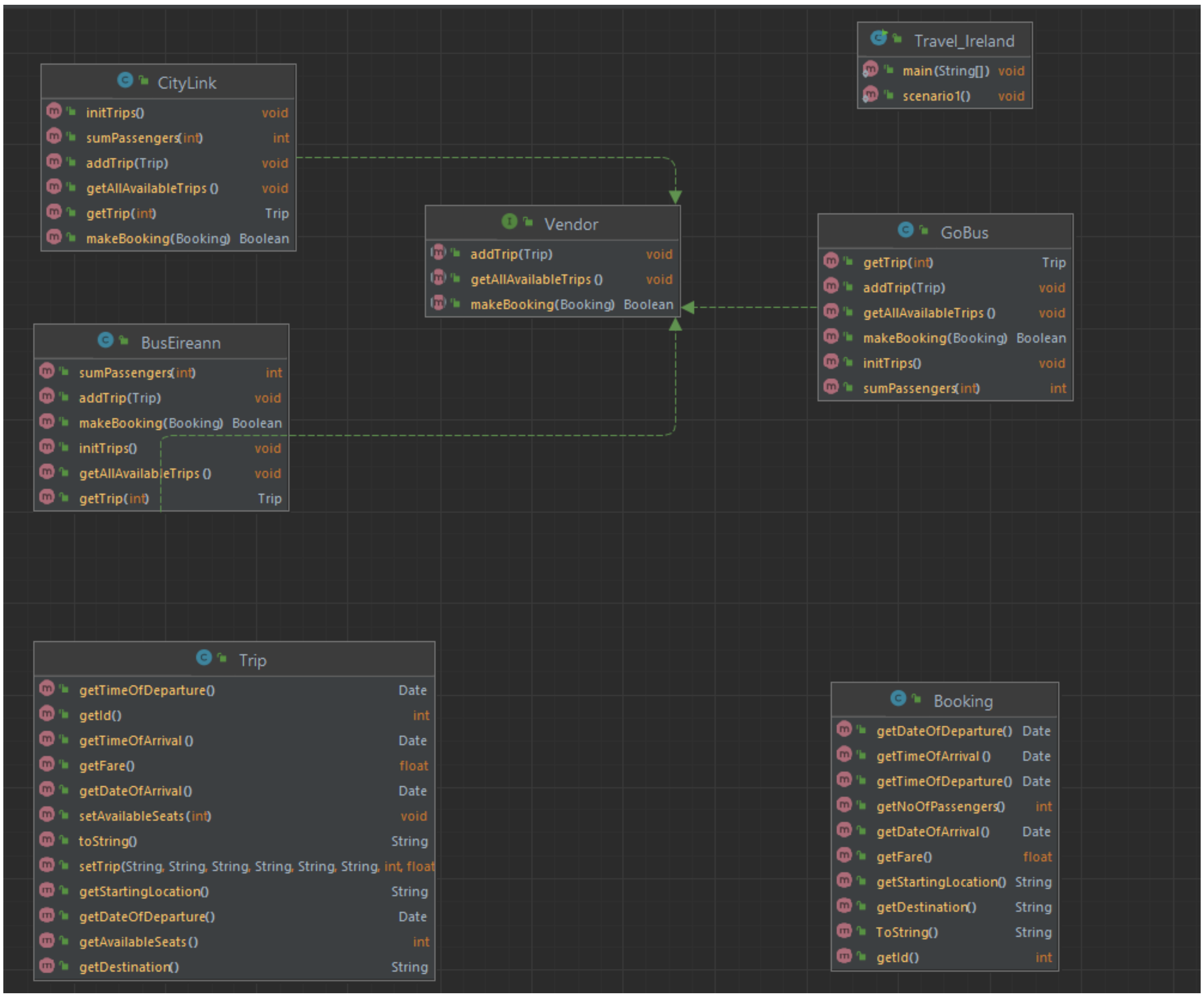
Project Overview



Vendor class is an interface with the key methods of each vendor (**BusEireann**, **CityLink**, **GoBus**).

Each of these vendors has an arrayList of **Trips** (routes travelled to) and **Bookings** for these trips. Each vendor implements its own logic to display available trips and also to decide whether a booking is possible or not.

The main class, **Travel_Ireland,** simulates a server that interacts with these vendors. It displays trip information from each vendor, then requests bookings. It then displays information about the booking and whether it was successful or not.

Travel_Ireland

```java
public class Travel_Ireland {

    public static void main(String[] args) {
        scenario1();
    }


    public static void scenario1() {

        // Scenario 1: Booking trips from all 3 vendors (2 valid and 1
invalid)

        BusEireann be = new BusEireann();
        CityLink cl = new CityLink();
        GoBus gb = new GoBus();

        be.initTrips();
        cl.initTrips();
        gb.initTrips();

        System.out.println("List of available trips:");
        be.getAllAvailableTrips();
        cl.getAllAvailableTrips();
        gb.getAllAvailableTrips();


        Trip selectedTrip = be.getTrip(1);

        Booking booking = new Booking(selectedTrip, 10);
        System.out.printf("\nAttempting to book trip %d with %d
passengers.\n", booking.getId(), booking.getNoOfPassengers());

        if (be.makeBooking(booking)) {
            System.out.println("Booking successful.");
            System.out.println("------------");
            System.out.printf("\nNumber of passengers: %d",
booking.getNoOfPassengers());
            System.out.printf("\nTraveling from %s to %s",
booking.getStartingLocation(), booking.getDestination());
            System.out.printf("\nTrip ID: %d", booking.getId());
            System.out.printf("\nTotal cost: €%.2f", booking.getFare());
            System.out.println("\n----------");

        } else {
            System.out.println("Too many passengers. Booking failed.");
            System.out.println("------------");
        }
        System.out.println("List of available trips:");
        be.getAllAvailableTrips();
        cl.getAllAvailableTrips();
        gb.getAllAvailableTrips();

        Trip selectedTrip2 = cl.getTrip(1);

        Booking booking2 = new Booking(selectedTrip2, 10);
        System.out.printf("\nAttempting to book trip %d with %d
passengers.\n", booking2.getId(), booking2.getNoOfPassengers());

        if (cl.makeBooking(booking2)) {
            System.out.println("Booking successful.");
            System.out.println("------------");
            System.out.printf("\nNumber of passengers: %d",
booking2.getNoOfPassengers());
            System.out.printf("\nTraveling from %s to %s",
booking.getStartingLocation(), booking2.getDestination());
            System.out.printf("\nTrip ID: %d", booking2.getId());
            System.out.printf("\nTotal cost: €%.2f", booking2.getFare());
            System.out.println("\n----------");

        } else {
            System.out.println("Too many passengers. Booking failed.");
            System.out.println("------------");
        }

        System.out.println("List of available trips:");
        be.getAllAvailableTrips();
        cl.getAllAvailableTrips();
        gb.getAllAvailableTrips();

        Trip selectedTrip3 = gb.getTrip(1);

        Booking booking3 = new Booking(selectedTrip2, 58);
        System.out.printf("\nAttempting to book trip %d with %d
passengers.\n", booking3.getId(), booking3.getNoOfPassengers());

        if (cl.makeBooking(booking3)) {
            System.out.println("Booking successful.");
            System.out.println("------------");
            System.out.printf("\nNumber of passengers: %d",
booking3.getNoOfPassengers());
            System.out.printf("\nTraveling from %s to %s",
booking.getStartingLocation(), booking3.getDestination());
            System.out.printf("\nTrip ID: %d", booking3.getId());
            System.out.printf("\nTotal cost: €%.2f", booking3.getFare());
            System.out.println("\n----------");

        } else {
            System.out.println("Too many passengers. Booking failed.");
            System.out.println("------------");
        }

    }
}
```

Vendor

```
import java.util.ArrayList;

public interface Vendor {
    public void addTrip(Trip t);

    public void getAllAvailableTrips();

    public Boolean makeBooking(Booking b);
}
```

Trip

```
import java.text.ParseException;
import java.text.SimpleDateFormat;
import java.util.Date;


public class Trip {


    String date = "dd/MM/yyyy";
    String time = "HH:mm";
    SimpleDateFormat df = new SimpleDateFormat(date);
    SimpleDateFormat tf = new SimpleDateFormat(time);
    private int id;
    private String startingLocation;
    private String destination;
    private Date DateOfDeparture;
    private Date TimeOfDeparture;
    private Date DateOfArrival;
    private Date TimeOfArrival;
    private float fare;
    private int availableSeats = 56; // arbitrary available seat number
(assumes standardised buses across vendors)
```

```java
public void setTrip(String startingLocation, String destination, String
DoD, String ToD,
                        String DoA, String ToA, int id, float fare) {

        this.startingLocation = startingLocation;
        this.destination = destination;
        this.id = id;
        this.fare = fare;

        try {
            this.DateOfDeparture = df.parse(DoD);
            this.TimeOfDeparture = tf.parse(ToD);
            this.DateOfArrival = df.parse(DoA);
            this.TimeOfArrival = tf.parse(ToA);
        } catch (java.text.ParseException e) {
            System.out.println("Parsing error");
            e.printStackTrace();
        }

    }

    public int getAvailableSeats() {
        return availableSeats;
    }

    public void setAvailableSeats(int availableSeats) {
        this.availableSeats = availableSeats;
    }

    public String getStartingLocation() {
        return startingLocation;
    }

    public String getDestination() {
        return destination;
    }

    public Date getDateOfDeparture() {
        return DateOfDeparture;
    }

    public Date getTimeOfDeparture() {
        return TimeOfDeparture;
    }

    public Date getDateOfArrival() {
        return DateOfArrival;
    }

    public Date getTimeOfArrival() {
        return TimeOfArrival;
    }

    public float getFare() {
        return fare;
    }

    public int getId() {
        return id;
    }
    public String toString() {
        return (String.format("[%s-%s] %s %s %s %s [%d] €%.2f\n",
startingLocation, destination, df.format(DateOfDeparture),
                tf.format(TimeOfDeparture), df.format(DateOfArrival),
tf.format(TimeOfArrival), id, fare));
    }

}
```

Booking

```
import java.text.DateFormat;
import java.text.SimpleDateFormat;
import java.time.LocalDate;
import java.time.LocalTime;
import java.util.Date;

public class Booking {

    String date = "MM/dd/yyyy";
    String time = "HH:mm";
    DateFormat df = new SimpleDateFormat(date);
    DateFormat tf = new SimpleDateFormat(time);
    private int id;
    private int noOfPassengers;
    private String startingLocation;
    private String destination;
    private Date DateOfDeparture;
    private Date TimeOfDeparture;
    private Date DateOfArrival;
    private Date TimeOfArrival;
    private float fare;
    public Booking(Trip trip, int noOfPassengers) {
        this.noOfPassengers = noOfPassengers;
        this.startingLocation = trip.getStartingLocation();
        this.destination = trip.getDestination();
        this.DateOfDeparture = trip.getDateOfDeparture();
        this.TimeOfDeparture = trip.getTimeOfDeparture();
        this.DateOfArrival = trip.getDateOfArrival();
        this.TimeOfArrival = trip.getTimeOfArrival();
        this.fare = trip.getFare();
        this.id = trip.getId();


    }

    public int getNoOfPassengers() {
        return noOfPassengers;
    }

    public int getId() {
        return id;
    }

    public String getStartingLocation() {
        return startingLocation;
    }
    public String getDestination() {
        return destination;
    }

    public Date getDateOfDeparture() {
        return DateOfDeparture;
    }

    public Date getTimeOfDeparture() {
        return TimeOfDeparture;
    }

    public Date getDateOfArrival() {
        return DateOfArrival;
    }

    public Date getTimeOfArrival() {
        return TimeOfArrival;
    }

    public float getFare() {
        return fare;
    }

    public String ToString() {
        return (String.format("%d %s %s %s %s %s %s %d %.2f\n",
noOfPassengers, destination, df.format(DateOfDeparture),
                tf.format(TimeOfDeparture), df.format(DateOfArrival),
tf.format(TimeOfArrival), id, fare));
    }

}
```

BusEireann

```java
import java.util.ArrayList;

public class BusEireann implements Vendor {

    Trip trip1 = new Trip();
    Trip trip2 = new Trip();
    private ArrayList<Trip> availableTrips = new ArrayList<>();
    private ArrayList<Booking> bookings = new ArrayList<>();

    // initialise hardcoded trips
    public void initTrips() {
        trip1.setTrip("Galway", "Dublin", "20/11/2022", "15:00",
                "20/11/2022", "18:00", 1989, 7.50F);


        trip2.setTrip("Galway", "Limerick", "22/11/2022", "12:00",
                "22/11/2022", "15:00", 1995, 6.50F);

        addTrip(trip1);
        addTrip(trip2);
    }

    public void addTrip(Trip t) {
        availableTrips.add(t);
    }

    public Trip getTrip(int index) {
        return (availableTrips.get(index));
    }

    public void getAllAvailableTrips() {
        for (Trip i : availableTrips) {
            System.out.printf(i.toString());
        }
    }

    public int sumPassengers(int id) {
        int numPassengers = 0;

        for (Booking booking : bookings) {
            if (booking.getId() == id) {
                numPassengers += booking.getNoOfPassengers();
            }
        }
        return numPassengers;
    }

    public Boolean makeBooking(Booking b) {
        // sum up total booked passengers for trip, if less than capacity
then return false

        // get trip that corresponds to booking

        Trip trip;
        int passengerSum = sumPassengers(b.getId());

        for (int i = 0; i < availableTrips.size(); i++) {
            if (availableTrips.get(i).getId() == b.getId()) {
                trip = availableTrips.get(i);

                if (passengerSum + b.getNoOfPassengers() <=
trip.getAvailableSeats()) {
                    // add booking
                    bookings.add(b);

                    // update amount of seats
                    trip.setAvailableSeats(56 - passengerSum);
                    return true;
                }
            }
        }
        return false;
    }
}
```

CityLink

```java
import java.util.ArrayList;

public class CityLink implements Vendor {

    Trip trip1 = new Trip();
    Trip trip2 = new Trip();
    private ArrayList<Trip> availableTrips = new ArrayList<>();
    private ArrayList<Booking> bookings = new ArrayList<>();

    // initialise hardcoded trips
    public void initTrips() {
        trip1.setTrip("Dublin", "Wexford", "20/11/2022", "15:00",
                "20/11/2022", "18:00", 4002, 7.50F);


        trip2.setTrip("Dundalk", "Dublin", "22/11/2022", "10:00",
                "22/11/2022", "13:00", 4004, 6.50F);

        addTrip(trip1);
        addTrip(trip2);
    }

    public void addTrip(Trip t) {
        availableTrips.add(t);
    }

    public Trip getTrip(int index) {
        return (availableTrips.get(index));
    }

    public void getAllAvailableTrips() {
        for (Trip i : availableTrips) {
            System.out.printf(i.toString());
        }
    }

    public int sumPassengers(int id) {
        int numPassengers = 0;

        for (Booking booking : bookings) {
            if (booking.getId() == id) {
                numPassengers += booking.getNoOfPassengers();
            }
        }
        return numPassengers;
    }


    public Boolean makeBooking(Booking b) {
        // sum up total booked passengers for trip, if less than capacity
then return false

        // get trip that corresponds to booking

        Trip trip;
        int passengerSum = sumPassengers(b.getId());

        for (int i = 0; i < availableTrips.size(); i++) {
            if (availableTrips.get(i).getId() == b.getId()) {
                trip = availableTrips.get(i);

                if (passengerSum + b.getNoOfPassengers() <=
trip.getAvailableSeats()) {
                    // add booking
                    bookings.add(b);

                    // update amount of seats
                    trip.setAvailableSeats(56 - passengerSum);
                    return true;
                }
            }
        }
        return false;
    }
}
```

GoBus

```java
import java.util.ArrayList;

public class GoBus implements Vendor {

    Trip trip1 = new Trip();
    Trip trip2 = new Trip();
    private ArrayList<Trip> availableTrips = new ArrayList<>();
    private ArrayList<Booking> bookings = new ArrayList<>();

    // initialise hardcoded trips
    public void initTrips() {
        trip1.setTrip("Donegal", "Sligo", "20/11/2022", "11:00",
                "20/11/2022", "13:00", 2004, 7.50F);


        trip2.setTrip("Cork", "Limerick", "22/11/2022", "12:00",
                "22/11/2022", "15:00", 2006, 6.50F);

        addTrip(trip1);
        addTrip(trip2);
    }

    public void addTrip(Trip t) {
        availableTrips.add(t);
    }

    public Trip getTrip(int index) {
        return (availableTrips.get(index));
    }

    public void getAllAvailableTrips() {
        for (Trip i : availableTrips) {
            System.out.printf(i.toString());
        }
    }

    public int sumPassengers(int id) {
        int numPassengers = 0;

        for (Booking booking : bookings) {
            if (booking.getId() == id) {
                numPassengers += booking.getNoOfPassengers();
            }
        }
        return numPassengers;
    }
    public Boolean makeBooking(Booking b) {
        // sum up total booked passengers for trip, if less than capacity
then return false

        // get trip that corresponds to booking

        Trip trip;
        int passengerSum = sumPassengers(b.getId());

        for (int i = 0; i < availableTrips.size(); i++) {
            if (availableTrips.get(i).getId() == b.getId()) {
                trip = availableTrips.get(i);

                if (passengerSum + b.getNoOfPassengers() <=
trip.getAvailableSeats()) {
                    // add booking
                    bookings.add(b);

                    // update amount of seats
                    trip.setAvailableSeats(56 - passengerSum);
                    return true;
                }
            }
        }
        return false;
    }
}
```