Solution Validation Checker - Specifications

ROADEF Challenge 2009

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1   Introduction

The solution checker provided to the ROADEF Challenge 2009 competitors is meant to verify that all problem constraints are respected. Based on input files, error reports, which depend on the nature of analyzed aspects (passengers, aircrafts, airports,…) are produced.

2   Access path and execution

All input files must be located under a %DATA% directory (for example, ./inputData). A «results» directory contains all output files ; it is produced automatically in the %DATA% directory.
The executable is called *solutionchecker*.

To run it, one should specify the access path to the %DATA% directory. For example:

> *solutionchecker ./inputData*

The output files are placed under the %DATA%/results directory

For the above run, the files are organized as follows:

./inputData/InputFiles.csv
./inputData/results/OutputFiles.txt
./solutionchecker

3   Input files

3.1 Format

All input files must adhere to the file format requirements specified in the challenge subject. No comment line should be left at the beginning of the fiile. Moreover, there should be no space left at the end of the lines.
All input files names are in lower case caracters

3.2 List of relevant files

aircraft.csv
airports.csv
alt_aircraft.csv
alt_airports.csv
alt_flights.csv
config.csv
dist.csv
flights.csv
itineraries.csv
rotations.csv
sol_rotations.csv
sol_itineraries.csv

The position file is not necessary to the solution validation checker

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4   Output files

11 output files are created in the *results* directory. If the solution fulfills all constraints, the files are empty. Otherwise, error messages are displayed in the files. See below the details of the files and messages.

4.1   checkItinerary.txt

`Fixed part of itinerary 3 missing flight(s) 3344, 3345`
Itinerary part outside recovery period is incomplete.

`Cancelled flight 5128 is taken on itinerary 3`

`Flight 4347 after cancellation on itinerary 3`
Itinerary 3 has a flight after the label « cancelled ». Example : `3 A 287.5 1 4344 07/01/06 E cancelled 4347 07/01/06 E`).

`Arrival of flight 3344 and departure of flight 5128 differ on itinerary 3`

`Connection time not respected between flight 4344 and flight 4333 on itinerary 3`

`Empty itinerary 3`

4.2   checkPassengerReac.txt

`Wrong type for itinerary 3`
Outbound itinerary in the input and Inbound in the solution, or the other way round

`Itinerary 3 departs before its original departure date`

`Violation of 18h max delay on itinerary 3`
For an outbound domestic or continental itinerary

`Violation of 36h max delay on itinerary 3`
For an outbound international itinerary

`Origin problem on itinerary 3`
Itinerary 3 origin in the solution doesn't match the origin in the input.

`Final destination problem on itinerary 3`

`Incorrect number of passengers reaccomodated on itinerary 3`

4.3   checkRotation.txt

`Wrong initial position for aircraft A319#2`

`Range violated on flight 145 on 2006-Mar-01 operated by aircraft A319#2`

Turn-round time violated on flight 145 on 2006-Mar-01 operated by aircraft A319#2

Transit time violated on flight 145 on 2006-Mar-01 operated by aircraft A319#2

Aircraft A319#2 arrives after maintenance start time on 2006-Mar-01 (10:00)

Max flying time before maintenance violated for aircraft A319#2

Maintenance position not respected for aircraft A319#2
At the start of maintenance service, aircraft A319#2 is not located at the right airport.

Aircraft A319#2 leaves before end of maintenance on 2006-Mar-01

Rotation continuity problem on aircraft A319#2
Two consecutive flights do not connect at the same airport for aircraft A319#2 rotation

Arrival flight 145 on 2006-Mar-01 after the end of recovery period

4.4 checkFlight.txt

Duration changed on flight 145 on 2006-Mar-01

Origin/destination changed on flight 145 on 2006-Mar-01

Flight 145 departing before planned departure time on 2006-Mar-01

Flight 145 linked flight changed on 2006-Mar-01

Newly created flight 146 on 2006-Mar-01 possesses a non null linked flight

Duration problem on newly created flight 200 on 2006-Mar-01

Flight 145 operated more than once on 2006-Mar-01

4.5 checkAircraftBreakdownPeriod.txt

Breakdown period not respected for aircraft A319#2
Breakdown unavailability of aircraft A319#2 is violated

4.6 checkAircraftCreation.txt

Aircraft A319#2 doesn't exist in original fleet

4.7 checkAircraftCapacity.txt

First cabin capacity exceeded on flight 145 on 2006-Mar-01 operated by aircraft A319#2

```
Business cabin capacity exceeded on flight 145 on 2006-Mar-01 operated by
aircraft A319#2

Eco cabin capacity exceeded on flight 145 on 2006-Mar-01 operated by
aircraft A319#2
```

4.8 checkAircraftSwap.txt

```
Swap incompatibility on flight 145 on 2006-Mar-01 (families of original
aircraft A319#2 and solution aircraft CRJ100#1 differ)
```

4.9 checkCancellationofCreatedRotation.txt

```
Cancellation of newly created flight 200 on 2006-Mar-01
```

4.10 checkAirportCapacity.txt

```
Departure capacity violated at airport ORY on 2006-Mar-01 (time window 8)

Arrival capacity violated at airport ORY on 2006-Mar-01 (time window 8)
```

4.11 checkFixedFlights.txt

This file refers to flight changes that do not respect disruption information provided in alt_flights.csv file, or to flights which are outside the recovery period (so called *fixed flights*) and should thus not be changed.

```
Departure/arrival time changed on disrupted flight 145 on 2006-Mar-01

Operating aircraft changed on disrupted flight 145 on 2006-Mar-01

Disrupted flight 145 cancelled on 2006-Mar-01

Cancelled flight 145 not respected on 2006-Mar-01

Departure/arrival time changed on fixed flight 145 on 2006-Mar-01

Operating aircraft changed on fixed flight 145 on 2006-Mar-01

Fixed flight 145 cancelled on 2006-Mar-01
```

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