

Java Coding Exercise

Welcome to Trelleborg coding exercise!

Please complete the exercise below and send us your solution. We perform these tests to get a feel for how you approach a problem, how you think and how you design and test your code.

We look forward to seeing what you can do.

Hypothetical Travel System

Key Concepts:

Touch On: On boarding a bus, passengers taps their credit card (identified by a Hashed Number called as Primary Account Number) which is called as Touch On.

Touch Off: When passenger gets off the bus, they tap their card again which is called a Touch Off.

Amount to Charge: The amount to charge the passenger will be determined where they Touch On and where the Touch Off. The amount is determined as follows:

- Trip Between Stop A and Stop B costs \$4.50
- Trip Between Stop B and Stop C costs \$6.25
- Trip Between Stop A and Stop C costs \$8.45

Travel Direction: The above Amount to Charge applies to travel in either direction. This means that the same amount is charged if a passenger Touch On at Stop A and Touch Off at Stop B OR they can Touch On at Stop B and Touch Off at Stop A.

Types of Trips

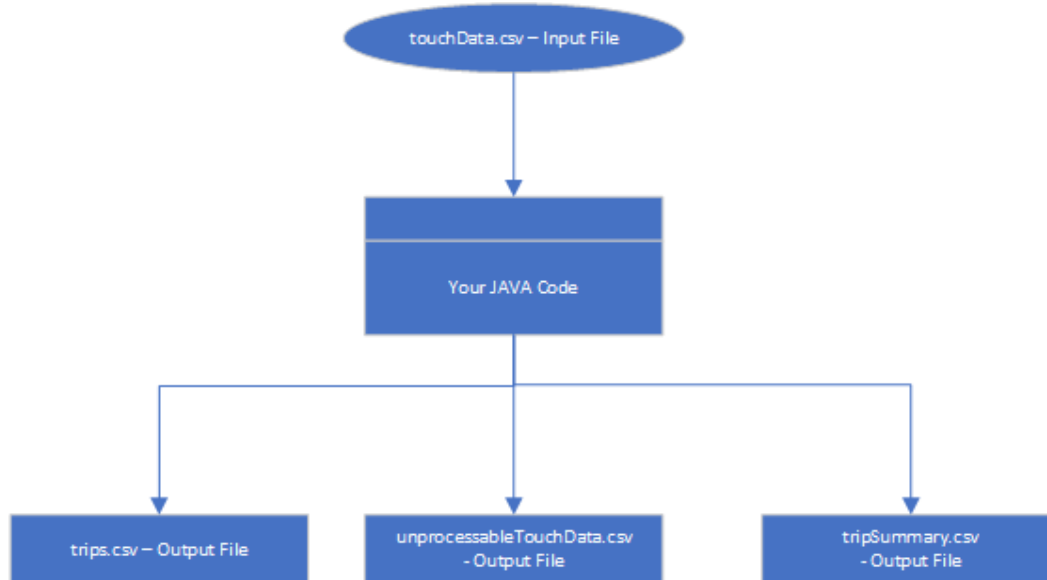
Completed Trips: If the passenger Touch On at one stop and Touch Off at another stop, this is treated as a completed trip. The amount to charge the passenger is determined by the above Amount to Charge section. E.g: Touch On at Stop A and Touch Off at Stop C is a completed trip and passenger is charged \$8.45.

Incomplete Trips: If the passenger Touch On at one stop and forget to Touch Off at another stop, this is treated as an incomplete trip. The passenger in this case is charged the maximum possible fare, where they could have travelled to. Eg: A passenger Touch On at Stop B and does not Touch Off, they could travelled to either Stop A (\$4.5) or Stop C (\$6.25). In this case, they will be charged the higher value (\$6.25).

Cancelled Trip: If the passenger Touch On and Touch Off at the same stop, this is called a cancelled trip and the passenger would not be charged.

Problem Scenario

Given an input file (**touchData.csv – data provided below**) in CSV format containing the Touch On and Touch Off data per line, you will produce 3 output files as defined below.



touchData.csv [Input File]

Input File Data Below. Paste this in a touchData.csv file to be used as Input.

```

ID, DateTimeUTC, TouchType, StopID, CompanyID, BusID, PAN
1,16-05-2023 12:15:00, ON, StopA, Company1, Bus10, 2255550000666662
2,16-05-2023 12:25:00, OFF, StopB, Company1, Bus10, 2255550000666667
3,16-05-2023 12:28:00, ON, StopB, Company2, Bus11, 2255550000336667
4,16-05-2023 12:45:00, OFF, StopC, Company2, Bus11, 2255550000336668
5,16-05-2023 12:55:00, ON, StopB, Company1, Bus25, 2255550000667767
6,16-05-2023 12:45:00, ON, StopA, Company3, Bus12, 1220000000000003
7,16-05-2023 12:45:00, OFF, StopA, Company3, Bus12, 4444333322221111
8,16-05-2023 12:45:00, ON, StopC, Company4, Bus13,
9,16-05-2023 12:45:00, ON, StopA, Company5, Bus14, ABC123
10,16-05-2023 12:45:00, ON, StopA, Company6, Bus15,
11,16-05-2023 12:55:00, OFF, StopB, Company6, Bus15, 4444333322221111
12,16-05-2023 12:45:00, ON, StopB, Company7, Bus16, 4444333322221111
13,16-05-2023 12:55:00, OFF, StopC, Company7, Bus16,
  
```

trips.csv Output File – To be Generated by the Solution

You will need to match the Touch On and Touch Off to create trips. You will need to determine how much to charge for the trip based on whether it was complete, incomplete or cancelled and where the Touch On and Touch Off occurred. The PAN should be SHA256 hashed.

Example Output File:

started	finished	DurationSec	fromStopId	toStopId	ChargeAmount	CompanyId	BusId	HashedPan	Status
16-05-2023 12:15:00	16-05-2023 12:25:00	600	StopA	StopB	4.5	Company1	Bus10	2a60e3ff1aa5a88ec...	COMPLETE

Example CSV for easy copy of headers

```
started,finished,DurationSec,fromStopId,toStopId,ChargeAmount,CompanyId,BusId,HashedPan,Status
16-05-2023 12:15:00,16-05-2023
12:25:00,600,StopA,StopB,4.50,Company1,Bus10,db3912d77ffa433c9629aea6151a98b30130f30c438d8da32
bd704f27e6bee19,COMPLETE
```

unprocessableTouchData.csv [Output File - To be Generated by the Solution]

Any Touch's that could not be processed will need to be written out to a file unprocessableTouchData.csv along with the reason they could not be processed (e.g. missing data, invalid data, duplicate touch etc.) The PAN should be 256 Hashed.

Example Output File:

started	finished	DurationSec	fromStopId	toStopId	ChargeAmount	CompanyId	BusId	HashedPan	Status
16-05-2023 12:45:00	16-05-2023 12:55:00	600	StopB	StopC	6.25	Company7	Bus16	<null>	Touch was missing PAN

Example CSV for easy copy of headers

```
started,finished,DurationSec,fromStopId,toStopId,ChargeAmount,CompanyId,BusId,HashedPan,Status
16-05-2023 12:15:00,16-05-2023 12:25:00,StopA,StopB,4.50,Company1,Bus10, , Touch was missing PAN
```

summary.csv [Output File - To be Generated by the Solution]

A summary of the trips needs to be written to a file called summary.csv. The file would contain the number of complete, incomplete and cancelled trips along with total charges, sorted and grouped by Date, CompanyId and BusID.

Example Output File:

date	CompanyId	BusId	CompleteTripCount	IncompleteTripCount	CancelledTripCount	TotalCharges
16-05-2023	Company1	Bus10	1	0	0	4.5

Example CSV for easy copy of headers

```
date,CompanyId,BusId,CompleteTripCount,IncompleteTripCount,CancelledTripCount,TotalCharges
16-05-2023,Company1,Bus10,1,0,0,4.5
```

Important: For security reasons, do NOT use real credit card numbers (PANs) in the test data you provide to us.

You can find credit card numbers suitable for testing at:

<http://support.worldpay.com/support/kb/bg/testandgolive/tgl5103.html>

Solution Expectations:

As part of your solution:

- List any assumptions that you made to solve this problem.
- Provide instructions on how to run the application.
- Provide a test harness to validate your solution.

Solution Submission:

- You could send your code as Zip file or a public GitHub repository link.

Thank You and Have fun!!