**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) in CSV format containing the Touch On and Touch Off data per line, you will produce 3 output files as defined below.

A picture containing text, screenshot, design

Description automatically generated

**touchData.csv [Input File]**

Example Input File

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, 2255550003366668

5,16-05-2023 12:55:00, ON, StopB, Company1, Bus25, 2255550000667767

**trips.csv [Output File]**

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:**

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,db3912d77ffa433c9629aea6151a98b30130f30c438d8da32bd704f27e6bee19,COMPLETE

**unprocessableTouchData.csv [Output File]**

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**:

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]**

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:**

date,CompanyId,BusId,CompleteTripCount,IncompleteTripCount,CancelledTripCount,TotalCharges

16-05-2023,Company1,Bus10,2,0,1,6.50

**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.

Thank You and Have fun!!