Software Engineer Coding Exercise

For this exercise, you will be working on building some settlement systems. We primarily use Python for this, but feel free to use the languages, libraries and resources of choice.

Setup

Part 1: Get data. Connect to the cryptocurrency exchange of your choice so that you start receiving live trading data of BTC/USD and ETH/USD. The trade data must have at least the following information:

- Trade ID – generated by you if it is not provided
- Time
- Product
- Price
- Quantity

Store this in a database table **trades.**

Part 2: Assign counterparties. For settlement, we will usually know who the counterparties to each trade are. We will simulate this for now. Please randomly assign at least 10 generated participants to all of the trading data you pull in, with one side being long and one side being short. Store this in the same **trades** table.

Part 3: Give the counterparties a balance. Randomly provide a starting balance to each participant in USD. This should be stored in another table. Store this in a **balances** table.

Settlement

Part 4: Create the trigger. Develop a method to run incremental settlements. That is, produce a settlement trigger that, upon first execution, runs the entire settlement system (i.e. parts 4+) against *all existing data*. Upon second execution, it should run the entire settlement system against all *new data since the first execution.* And then so on, each new execution should settle everything since the previous execution.

Part 5: Produce a settlement price. Develop a volume-weighted average price (VWAP) settlement value per product, in USD. This should be on the last hour of trading in the sample being settled and NOT the entire period, if longer than an hour.

Part 6: Calculate settlements. Now we must calculate the settlement obligations. The settlement obligations will be the difference between the settlement price and the trade price, multiplied by the quantity. We are assuming all of the trades are financially settled. Publish the settlements to a **settlements** table, which has at least the following fields:

- From Participant: the participant that must pay, i.e. the participant that lost on the trade
- To Participant: the participant that receives, i.e. the participant that gained on the trade
- Currency: the settlement currency (USD)

- Amount: the settlement obligation

Part 7: Update the balances. Update the participants' balances in the **balances** table from the previous settlement run (or from Part 3 in the first run).

Work Specifics

To submit your work, please zip and send via email. Please include:

- Your code and sources of data.
- Write up of any non-code answers, assumptions used and design thoughts.
- Any tests used to validate the submission.
- Directions that allow Seed CX to run and test the code.