Background

We want to display on an LED screen, for a set of 5 currency pairs, both the current FX exchange rate and an indication of the change compared to yesterday's rate at 5PM New York time.

We receive the rates as high frequency (assume updates for multiple currency pairs every millisecond) structured data, similar to the data in rates_sample.csv:

event_id	event_time	ccy_couple	rate
288230383844089590	1704146399036	EURUSD	1.080790000000000
288230383844089594	1704146399038	NZDUSD	0.616420000000000
288230383844089658	1704146400001	EURUSD	1.080780000000000
..	..	..	..

For the LED screen to display information, it must be fed with input in the below format:

```
ccy_couple,rate,change
"EUR/USD",1.08081,"-0.208%"
```

Description of fields:

- `event_id`: a unique identifier
- `event_time`: the epoch time in milliseconds
- `ccy_couple`: the currency pair, made up of the ISO code of two currencies
- `rate`: the exchange rate value at the given epoch time

Further notes:

- a rate is considered *active* iff it's the last one received for a given currency couple AND it's not older than 30 seconds
- everything not specified is to be decided by you, please document all such decisions

Requirements

A.

We would like to schedule a job which runs every 1 hour to determine the current rate and percentage change for each of the 5 currency pairs. The job should only take the *active* rates into account; for the currency pairs that don't have an *active* rate, no output should be produced.The job should be implemented in the SQL language.

B.

Assuming 300 currency couples instead of 5, and assuming the job needs to run every 1 minute, would you change anything about the implementation of your solution? Could you provide the updated solution as well?

Optional:

Instead of batch processing, we would like to change the process into a streaming one. Can you create a solution in a language of your choice which would display the data in real time?