Data Streams and CEP - Assignment N°04

The assignment sheet contains 2 exercises. Solutions should be uploaded at the VC before the deadline (08.02.2021). Solutions can be uploaded as a ZIP file. Each exercise requires a specific answer structure. Questions related to content presented in the lectures should be answered with concise text and uploaded in a pdf file. Exercises that require writing queries should be uploaded as text files.

Exercise 1: We want to perform some pattern matching on data streams using the bids stream provided by the Nexmark data generator. Write queries for Odysseus using SASE+ language to detect the following patterns:

1- A bid for auction id = 0 is followed by another bid for auction id = 1 within 10 seconds.
2- A bid for any auction is followed by a higher bid of the same auction (also within 10 seconds).
3- A bid for any auction is followed by a doubled offer bid of the same auction within 60 seconds.
4- A bid for any auction is followed by a bid, with a price 80 % more than the previous bid (within 10 seconds).
5- Three persons that register themselves in an interval of 30 seconds.
6- Three users who opened an auction within an interval of 120 seconds.
7- Persons who received at least 5 bids for their auctions within an interval of 10 minutes.
8- Persons who opened an auction and made a bid for another auction.
9- Draw the automaton and state transitions for the queries 2, 3 and 4.

A SASE+ description can be found under the following link:

https://wiki.odysseus.informatik.uni-oldenburg.de/display/ODYSSEUS/SASE

Exercise 2: Answer the following questions:

1- What are the pattern policies offered by SASE+?
2- Give a use case for each pattern policy (use case means an example where the policy is applied).
3- Explain briefly what each of the clauses PATTERN, WHERE, and WITHIN is responsible for.
4- What are the termination criteria for a *Kleene* closure (might need to look further than the slides content for this, you can take a look at the paper: *On Supporting Kleene Closure over Event Streams*; Daniel Gyllstrom, Jagrati Agrawal, Yanlei Diao and Neil Immerman).
5- Which additional general pattern policy is "hidden" in the termination criteria of Kleene closure in SASE+?