Event Processing Add-on (Lab)

TECHNISCHE UNIVERSITÄT DARMSTADT

Summer Term 2013

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Implementation assignment 22.05.2013

In this complementary implementation assignment we ask you to apply the concepts of the lecture to a large-scale event processing task. The task follows this year's DEBS Grand Challenge.

Please visit http://www.orgs.ttu.edu/debs2013/index.php?goto=cfchallengedetails and **read the description carefully** (including the FAQ at the end). Among some background information, the website defines four complex event processing queries to be implemented. Your task is to implement the four queries and give results based on the data available on the website.

We make some refinements to the original assignment:

Query 1

You only need to implement the 5-minute time window. You can output the stream into a file.

Query 2

You only need to implement the 5-minute time window. You can output the stream into a file.

Query 3

You only need to consider the case of 32x50 cells. Instead of outputting the stream into a file, we ask you to display the heat maps graphically. More specifically, the heat maps for the time windows 10 seconds, 1 minute, 5 minutes and 10 minutes of one player should be displayed at the same time and updated once a second. Also, you do not need to split the heat maps by the half (contrary to Question 11).

Query 4

Please note that the output stream should only output data as long as the ball is moving towards the goals. You can output the stream into a file. Also, please use the following (reduced) output schema:

ts, player_id, x, y, |v|

Modalities

Write emails about this assignment always to all three of us.

You may work on this assignment alone or in groups of 2 people. We do not allow larger groups. If you would like to work in a group, please write one email per group with the group members **by May 31st**. New team assemblies won't be possibly after May 31st.

Register for the event processing add-on in TUCaN.

At the end of the semester, you will have to present your solution to us. You should be able to explain the reasoning behind your queries and design. For groups, we require that each group member to be able to answer each of our questions. So even if you share work, make sure that everyone understands the implemented queries.

Important: Hand in a two-pages report that documents your implementation of the queries. Deadline is: 08.09.2013.

The grading will be pass/fail. When you pass, you will receive additional 3CP; the grade will be the same as for the lecture, i.e., the final exam will be worth 6CP. In case you fail, you have the opportunity to resign from the event processing add-on task in TUCaN; the final exam will then be worth 3CP.

Hints

- This assignment leaves a lot of degrees of freedom. Thus, if in doubt, please ask us.
- You may use an open source stream processing engine, e.g., Esper or an industry-ready engine by Software AG: webMethods Business Events.
  - You can get Esper at http://esper.codehaus.org/.
  - If you prefer webMethods (plus some interesting main memory and visualization tools) please go to http://techcommunity.softwareag.com/signup and create an account with your **university email address**. Once you have done that, inform us that you signed up and which email address you used. We will get in contact with Software AG and activate your account. Once this is done, you can login to the site and access the software and its documentation.
- Since the file with the events is very big, you might find the following excerpt useful:

```
23,10634807612617634,25337,-4952,663,131342,621781,-7484,6316,2019,-4984,-7114,-4953
100,10634807682441082,26185,-14,903,37241,1274521,-6459,7440,-1705,5497,6798,-4854
88,10634807698488753,27839,-4295,-269,139360,831034,-1708,3194,9320,-4876,-1313,8631
38,10634807708610931,26744,-327,390,12248,694682,4441,6806,-5825,-3011,793,-9502
44,10634807995153703,25744,-1455,203,319920,3265367,1604,-9862,-400,2976,-9479,-1130
105,10634808486180570,25373,-1761,-1612,122380,1254386,2641,-5775,-7724,2778,-2398,-9301
53,10634808489552265,25212,-4616,351,77062,2153315,8503,4450,-2807,8962,-1293,4243
106,10634808490674391,25353,-2713,275,80531,1002053,6387,-3587,-6806,9548,-2961,-242
14,10634808869461738,26226,-5729,-451,114087,110128,-5572,1036,-8238,1114,7729,-6246
28,10634808938009601,27909,-3716,351,153298,2951969,8397,-16,-5430,8661,-3749,-3305
59,10634809054259662,27658,-4110,1214,253553,860254,-3104,-300,9501,-8961,-3489,2741
```

- Since the timestamps are given in picoseconds, this makes exact timing in Java very difficult (Java's delays become inexact below 1ms). Thus, we do not require that you keep the exact rate the events were produced in. You can be as fast as you want to, but you should not be considerably slower.
- The event stream starts a couple of minutes before the game starts; thus no position updates happen at the beginning.

Office hours

We provide office hours upon appointment. Please make use of them in case of questions or problems. If your solution is not working and you have not contacted us prior to the final attestation, you will fail.