

Big Data Systems – Data Streams

Assignment #4

Due Date: June 29th, 2025, 11:59pm

You are going to use Azure Stream Analytics to process a data stream of ATM transactions and answer stream queries. The schema of the stream is: (ATMCode, CardNumber, Type, Amount)

1. Create a trial account at: <https://azure.microsoft.com/en-us/>
2. Setup an Event Hub.
3. Generate a Security Access Signature: <https://github.com/sandrinodimattia/RedDog/releases>
4. Edit Generator.html (open with notepad) and update the CONFIG variables with your security access signature.
5. Feed the Event Hub with the use of Generator.html (Open Generator.html in a web browser and press the "Send Data" button.)
6. Setup a Storage account.
7. Upload the Reference Data files to your storage account (the How-To presentation will be updated to include reference data material.)
8. Setup a Stream Analytics Job.
9. Use the Event Hub + Reference Data Files as Input.
10. Create a Blob Storage Output.
11. Run the following queries:

Query 1:

Show the total "Amount" of "Type = 0" transactions at "ATM Code = 21" of the last 10 minutes. Repeat as new events keep flowing in (use a sliding window).

Query 2:

Show the total "Amount" of "Type = 1" transactions at "ATM Code = 21" of the last hour. Repeat once every hour (use a tumbling window).

Query 3:

Show the total "Amount" of "Type = 1" transactions at "ATM Code = 21" of the last hour. Repeat once every 30 minutes (use a hopping window).

Query 4:

Show the total "Amount" of "Type = 1" transactions per "ATM Code" of the last one hour (use a sliding window).

Query 5:

Show the total "Amount" of "Type = 1" transactions per "Area Code" of the last hour. Repeat once every hour (use a tumbling window).

Query 6:

Show the total "Amount" per ATM's "City" and Customer's "Gender" of the last hour. Repeat once every hour (use a tumbling window).

Query 7:

Alert (SELECT "1") if a Customer has performed two transactions of "Type = 1" in a window of an hour (use a sliding window).

Query 8:

Alert (SELECT "1") if the "Area Code" of the ATM of the transaction is not the same as the "Area Code" of the "Card Number" (Customer's Area Code) - (use a sliding window)