Loading the Lookup Table

- **Commands to load the relevant data in the Lookup Table**

"**ranked_card_transactions_orc**" table stores last 10 transactions for each card_id. Used ORC format for better performance and "**card_ucl_orc**" table stores UCL value for each card_id.

1. Load data in "**ranked_card_transactions_orc**" table

```
INSERT OVERWRITE TABLE RANKED_CARD_TRANSACTIONS_ORC
SELECT B.CARD_ID,
B.AMOUNT,
B.POSTCODE,
B.TRANSACTION_DT,
B.RANK
FROM (SELECT A.CARD_ID,
A.AMOUNT,
A.POSTCODE,
A.TRANSACTION_DT,
RANK() OVER(PARTITION BY A.CARD_ID ORDER BY A.TRANSACTION_DT
DESC, AMOUNT DESC) AS RANK
FROM (SELECT CARD_ID, AMOUNT, POSTCODE, TRANSACTION_DT FROM
CARD_TRANSACTIONS_HBASE WHERESTATUS = 'GENUINE')
A ) B WHERE B.RANK <= 10;
```

2. Load data in "**card_ucl_orc**" table. In innermost query, select card_id, average of amount and standard deviation of amount from card_transactions_orc. In outermost query, select card_id and compute UCL using average and standard deviation with formula (avg + (3 * stddev)). Insert all this data in card_ucl_orc.

   ```
   INSERT OVERWRITE TABLE CARD_UCL_ORC
   SELECT A.CARD_ID,
   (A.AVERAGE + (3 * A.STANDARD_DEVIATION)) AS UCL FROM ( SELECT CARD_ID,
   AVG(AMOUNT) AS AVERAGE, STDDEV(AMOUNT) AS STANDARD_DEVIATION
   FROM RANKED_CARD_TRANSACTIONS_ORC
   GROUP BY CARD_ID) A;
   ```

3. Load data in lookup_data_hbase table.

   INSERT OVERWRITE TABLE LOOKUP_DATA_HBASE SELECT RCTO.CARD_ID,
   CUO.UCL,
   CMS.SCORE,
   RCTO.POSTCODE,
   RCTO.TRANSACTION_DTFROM RANKED_CARD_TRANSACTIONS_ORC
   RCTO JOIN CARD_UCL_ORC CUO ON CUO.CARD_ID = RCTO.CARD_IDJOIN (
   SELECT DISTINCT CARD.CARD_ID,
   SCORE.SCOREFROM CARD_MEMBER_ORC CARD
   JOIN MEMBER_SCORE_ORC SCORE ON CARD.MEMBER_ID =
   SCORE.MEMBER_ID) AS CMSON
   RCTO.CARD_ID = CMS.CARD_ID WHERE RCTO.RANK = 1;

- **Command to see the table created and it's content**

1. Verify count in "**lookup_data_hbase**" table.

   select count(*) from lookup_data_hbase;

2. Verify some data in "**lookup_data_hbase**" table.

   select * from lookup_data_hbase limit 10;

3. Verify data in "**lookup_data_hive**" table.

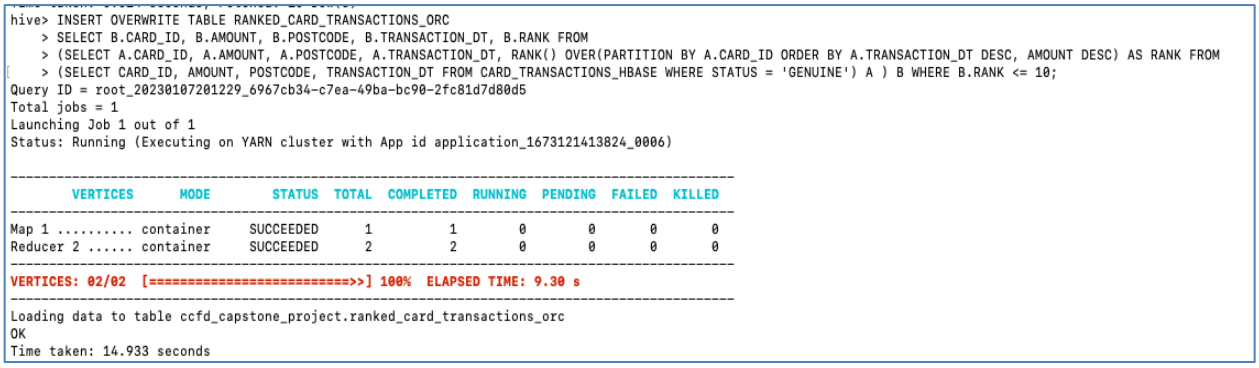
   scan 'lookup_data_hive'

4. Verify count in "**lookup_data_hive**" table.

   Count 'lookup_data_hive'

- **Screenshot of the created table**

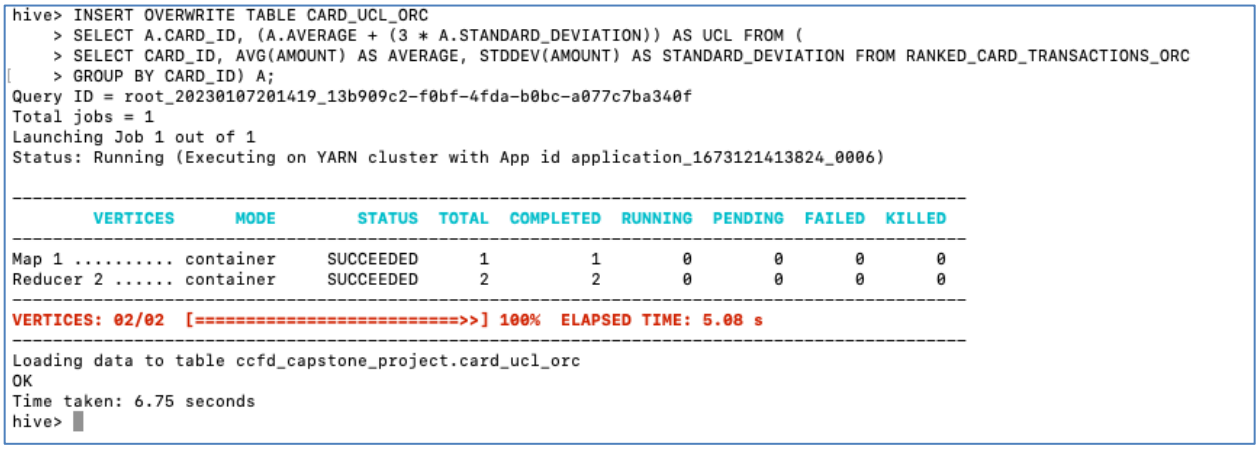
1. Load data in “**ranked_card_transactions_orc**” table



```
hive> INSERT OVERWRITE TABLE RANKED_CARD_TRANSACTIONS_ORC
    > SELECT B.CARD_ID, B.AMOUNT, B.POSTCODE, B.TRANSACTION_DT, B.RANK FROM
    > (SELECT A.CARD_ID, A.AMOUNT, A.POSTCODE, A.TRANSACTION_DT, RANK() OVER(PARTITION BY A.CARD_ID ORDER BY A.TRANSACTION_DT DESC, AMOUNT DESC) AS RANK FROM
    > (SELECT CARD_ID, AMOUNT, POSTCODE, TRANSACTION_DT FROM CARD_TRANSACTIONS_HBASE WHERE STATUS = 'GENUINE') A ) B WHERE B.RANK <= 10;
Query ID = root_20230107201229_6967cb34-c7ea-49ba-bc90-2fc81d7d80d5
Total jobs = 1
Launching Job 1 out of 1
Status: Running (Executing on YARN cluster with App id application_1673121413824_0006)

--------------------------------------------------------------------------------
        VERTICES      MODE        STATUS  TOTAL  COMPLETED  RUNNING  PENDING  FAILED  KILLED
--------------------------------------------------------------------------------
Map 1 .......... container     SUCCEEDED      1          1        0        0       0       0
Reducer 2 ...... container     SUCCEEDED      2          2        0        0       0       0
--------------------------------------------------------------------------------
VERTICES: 02/02  [==========================>>] 100%  ELAPSED TIME: 9.30 s
--------------------------------------------------------------------------------
Loading data to table ccfd_capstone_project.ranked_card_transactions_orc
OK
Time taken: 14.933 seconds
```

2. Load data in "**card_ucl_orc**" table.



```
hive> INSERT OVERWRITE TABLE CARD_UCL_ORC
    > SELECT A.CARD_ID, (A.AVERAGE + (3 * A.STANDARD_DEVIATION)) AS UCL FROM (
    > SELECT CARD_ID, AVG(AMOUNT) AS AVERAGE, STDDEV(AMOUNT) AS STANDARD_DEVIATION FROM RANKED_CARD_TRANSACTIONS_ORC
    > GROUP BY CARD_ID) A;
Query ID = root_20230107201419_13b909c2-f0bf-4fda-b0bc-a077c7ba340f
Total jobs = 1
Launching Job 1 out of 1
Status: Running (Executing on YARN cluster with App id application_1673121413824_0006)

--------------------------------------------------------------------------------
        VERTICES      MODE        STATUS  TOTAL  COMPLETED  RUNNING  PENDING  FAILED  KILLED
--------------------------------------------------------------------------------
Map 1 .......... container     SUCCEEDED      1          1        0        0       0       0
Reducer 2 ...... container     SUCCEEDED      2          2        0        0       0       0
--------------------------------------------------------------------------------
VERTICES: 02/02  [==========================>>] 100%  ELAPSED TIME: 5.08 s
--------------------------------------------------------------------------------
Loading data to table ccfd_capstone_project.card_ucl_orc
OK
Time taken: 6.75 seconds
hive>
```

3. Load data in **lookup_data_hbase** table.

```
hive> INSERT OVERWRITE TABLE LOOKUP_DATA_HBASE
    > SELECT RCTO.CARD_ID, CUO.UCL, CMS.SCORE, RCTO.POSTCODE, RCTO.TRANSACTION_DT FROM RANKED_CARD_TRANSACTIONS_ORC RCTO
    > JOIN CARD_UCL_ORC CUO
    > ON CUO.CARD_ID = RCTO.CARD_ID JOIN (
    > SELECT DISTINCT CARD.CARD_ID, SCORE.SCORE FROM CARD_MEMBER_ORC CARD
    > JOIN MEMBER_SCORE_ORC SCORE
    > ON CARD.MEMBER_ID = SCORE.MEMBER_ID) AS CMS ON RCTO.CARD_ID = CMS.CARD_ID
    > WHERE RCTO.RANK = 1;
No Stats for ccfd_capstone_project@ranked_card_transactions_orc, Columns: postcode, rank, transaction_dt, card_id
No Stats for ccfd_capstone_project@card_ucl_orc, Columns: card_id, ucl
No Stats for ccfd_capstone_project@card_member_orc, Columns: member_id, card_id
No Stats for ccfd_capstone_project@member_score_orc, Columns: member_id, score
Query ID = root_20230107202226_6ce74dd9-634c-47dc-bc11-b38ef85cde49
Total jobs = 1
Launching Job 1 out of 1
Tez session was closed. Reopening...
Session re-established.
Status: Running (Executing on YARN cluster with App id application_1673121413824_0007)

--------------------------------------------------------------------------------
        VERTICES      MODE        STATUS  TOTAL  COMPLETED  RUNNING  PENDING  FAILED  KILLED
--------------------------------------------------------------------------------
Map 1 .......... container     SUCCEEDED      1          1        0        0       0       0
Map 2 .......... container     SUCCEEDED      1          1        0        0       0       0
Map 3 .......... container     SUCCEEDED      1          1        0        0       0       0
Map 5 .......... container     SUCCEEDED      1          1        0        0       0       0
Reducer 4 ...... container     SUCCEEDED      2          2        0        0       0       0
--------------------------------------------------------------------------------
VERTICES: 05/05  [==========================>>] 100%  ELAPSED TIME: 11.70 s
--------------------------------------------------------------------------------
OK
Time taken: 23.863 seconds
hive>
```

4. Verify count in "**lookup_data_hbase**" table.

```
hive> select count(*) from lookup_data_hbase;
Query ID = root_20230107202328_b2487dbf-0810-43f1-8f62-42c8a80a255d
Total jobs = 1
Launching Job 1 out of 1
Status: Running (Executing on YARN cluster with App id application_1673121413824_0007)

--------------------------------------------------------------------------------
        VERTICES      MODE        STATUS  TOTAL  COMPLETED  RUNNING  PENDING  FAILED  KILLED
--------------------------------------------------------------------------------
Map 1 .......... container     SUCCEEDED      1          1        0        0       0       0
Reducer 2 ...... container     SUCCEEDED      1          1        0        0       0       0
--------------------------------------------------------------------------------
VERTICES: 02/02  [==========================>>] 100%  ELAPSED TIME: 5.10 s
--------------------------------------------------------------------------------
OK
999
Time taken: 8.104 seconds, Fetched: 1 row(s)
hive>
```

Total number for record is **999** which is matching with given requirement.

5. Verify some data in "**lookup_data_hbase**" table.

```
hive> select * from lookup_data_hbase limit 10;
OK
340028465709212 1.6331555548882348E7    233     24658   2018-01-02 03:25:35
340054675199675 1.4156079786189131E7    631     50140   2018-01-15 19:43:23
340082915339645 1.5285685330791473E7    407     17844   2018-01-26 19:03:47
340134186926007 1.5239767522438556E7    614     67576   2018-01-18 23:12:50
340265728490548 1.608491671255562E7     202     72435   2018-01-21 02:07:35
340268219434811 1.2507323937605347E7    415     62513   2018-01-16 04:30:05
340379737226464 1.4198310998368107E7    229     26656   2018-01-27 00:19:47
340383645652108 1.4091750460468251E7    645     34734   2018-01-29 01:29:12
340803866934451 1.0843341196185412E7    502     87525   2018-01-31 04:23:57
340889618969736 1.32179423655153 21E7   330     61341   2018-01-31 21:57:18
Time taken: 0.226 seconds, Fetched: 10 row(s)
hive>
```

6. Verify data in "**lookup_data_hive**" table.

```
6594248319343442                        column=lookup_card_family:score, timestamp=1673122970520, value=350
6594248319343442                        column=lookup_card_family:ucl, timestamp=1673122970520, value=1.4567957140418548E7
6594248319343442                        column=lookup_transaction_family:postcode, timestamp=1673122970520, value=24927
6594248319343442                        column=lookup_transaction_family:transaction_dt, timestamp=1673122970520, value=2018-01-31 23:42:38
6595638658736751                        column=lookup_card_family:score, timestamp=1673122970520, value=310
6595638658736751                        column=lookup_card_family:ucl, timestamp=1673122970520, value=1.356629177577566E7
6595638658736751                        column=lookup_transaction_family:postcode, timestamp=1673122970520, value=68328
6595638658736751                        column=lookup_transaction_family:transaction_dt, timestamp=1673122970520, value=2018-01-30 10:50:34
6595814135833988                        column=lookup_card_family:score, timestamp=1673122970520, value=210
6595814135833988                        column=lookup_card_family:ucl, timestamp=1673122970520, value=1.3926273240525039E7
6595814135833988                        column=lookup_transaction_family:postcode, timestamp=1673122970520, value=22508
6595814135833988                        column=lookup_transaction_family:transaction_dt, timestamp=1673122970520, value=2018-01-30 02:03:54
6595928469079750                        column=lookup_card_family:score, timestamp=1673122970520, value=412
6595928469079750                        column=lookup_card_family:ucl, timestamp=1673122970520, value=1.142797041440079E7
6595928469079750                        column=lookup_transaction_family:postcode, timestamp=1673122970520, value=98349
6595928469079750                        column=lookup_transaction_family:transaction_dt, timestamp=1673122970520, value=2018-01-24 12:38:22
6597703848279563                        column=lookup_card_family:score, timestamp=1673122970520, value=218
6597703848279563                        column=lookup_card_family:ucl, timestamp=1673122970520, value=1.4718634149498457E7
6597703848279563                        column=lookup_transaction_family:postcode, timestamp=1673122970520, value=95699
6597703848279563                        column=lookup_transaction_family:transaction_dt, timestamp=1673122970520, value=2018-01-27 10:51:49
6598830758632447                        column=lookup_card_family:score, timestamp=1673122970520, value=293
6598830758632447                        column=lookup_card_family:ucl, timestamp=1673122970520, value=1.2227949982601807E7
6598830758632447                        column=lookup_transaction_family:postcode, timestamp=1673122970520, value=19421
6598830758632447                        column=lookup_transaction_family:transaction_dt, timestamp=1673122970520, value=2018-01-30 00:18:34
6599900931314251                        column=lookup_card_family:score, timestamp=1673122970520, value=297
6599900931314251                        column=lookup_card_family:ucl, timestamp=1673122970520, value=1.2121408572464656E7
6599900931314251                        column=lookup_transaction_family:postcode, timestamp=1673122970520, value=97423
6599900931314251                        column=lookup_transaction_family:transaction_dt, timestamp=1673122970520, value=2018-01-31 11:25:16
999 row(s) in 1.1810 seconds

hbase(main):003:0>
```

7. Verify count in '**lookup_data_hive**'

```
hbase(main):001:0> count 'lookup_data_hive'
999 row(s) in 0.4410 seconds

=> 999
hbase(main):002:0>
```

Total number for record is **999** which is matching with given requirement.