# SNOWFLAKE AS QUERY ENIGINE

## 1. GOALS

In this assignment, we will learn how to use snowflake as a query engine. We store our data in aws s3 and we will learn various methods to query it from snowflake.

A. Query data in s3 from snowflake.

B. Create view over data in aws s3.

C. Disadvantages and advantages of this approach.

## 2. PREPARATION

Before we start, let's upload some sample data from snowflake to s3. Then we will try to query data in s3 from snowflake.

Create table,

```
CREATE OR REPLACE TRANSIENT TABLE DEMO_DB.PUBLIC.CUSTOMER_TEST
AS
SELECT * FROM
"SNOWFLAKE_SAMPLE_DATA"."TPCDS_SF100TCL"."CUSTOMER"
```

Execute below copy command to copy data to s3,

```
COPY INTO @DEMO_DB.PUBLIC.MY_S3_STAGE/Customer_data/
from
DEMO_DB.PUBLIC.CUSTOMER_TEST
```

```
COPY INTO @RWD_DEV_DB.RAVEN_ETL_POC.RAVEN_POC_STAGE/Customer_data/
from
RWD_DEV_DB.RAVEN_ETL_POC.CUSTOMER_TEST  -- 100 Million
```

Data Preview

ery ID SQL 56.63s 1 rows

esult... Copy Columns

| Row | rows_unloaded | input_bytes | output_bytes |
|---|---|---|---|
| 1 | 100000000 | 14157203751 | 5763684206 |

## 3. QUERY DATA IN S3 FROM SNOWFLAKE.

Now data got uploaded to s3. We have 100 Million records uploaded and data size is 4.5 GB. Uploaded files will be csv compressed files.

Let's try to query this data in s3 from snowflake.

```
SELECT $1 C_CUSTOMER_SK,
$2  C_CUSTOMER_ID       ,
$3  C_CURRENT_CDEMO_SK       ,
$4  C_CURRENT_HDEMO_SK       ,
$5  C_CURRENT_ADDR_SK,
$6  C_FIRST_SHIPTO_DATE_SK     ,
$7  C_FIRST_SALES_DATE_SK      ,
$8  C_SALUTATION       ,
$9  C_FIRST_NAME       ,
$10 C_LAST_NAME,
$11 C_PREFERRED_CUST_FLAG     ,
$12 C_BIRTH_DAY ,
$13 C_BIRTH_MONTH       ,
$14 C_BIRTH_YEAR,
$16 C_LOGIN       ,
$17 C_EMAIL_ADDRESS     ,
$18 C_LAST_REVIEW_DATE
FROM @DEMO_DB.PUBLIC.MY_S3_STAGE/Customer_data/. ---replace it with new stage
(file_format => DEMO_DB.PUBLIC.MY_CSV_FORMAT)
```

**Filter data directly from s3,**

```
SELECT $1 C_CUSTOMER_SK,
$2  C_CUSTOMER_ID       ,
$3  C_CURRENT_CDEMO_SK       ,
$4  C_CURRENT_HDEMO_SK       ,
$5  C_CURRENT_ADDR_SK,
$6  C_FIRST_SHIPTO_DATE_SK     ,
```

```
$7  C_FIRST_SALES_DATE_SK       ,
$8  C_SALUTATION          ,
$9  C_FIRST_NAME          ,
$10 C_LAST_NAME,
$11 C_PREFERRED_CUST_FLAG     ,
$12 C_BIRTH_DAY ,
$13 C_BIRTH_MONTH       ,
$14 C_BIRTH_YEAR,
$16 C_LOGIN         ,
$17 C_EMAIL_ADDRESS     ,
$18 C_LAST_REVIEW_DATE
FROM @DEMO_DB.PUBLIC.MY_S3_STAGE/Customer_data/
(file_format => DEMO_DB.PUBLIC.MY_CSV_FORMAT)
WHERE C_CUSTOMER_SK ='64596949'
```

**Execute group by,**

```
SELECT $9 C_FIRST_NAME,$10 C_LAST_NAME,COUNT(*)
FROM @DEMO_DB.PUBLIC.MY_S3_STAGE/Customer_data/
(file_format => DEMO_DB.PUBLIC.MY_CSV_FORMAT)
GROUP BY $9,$10
```

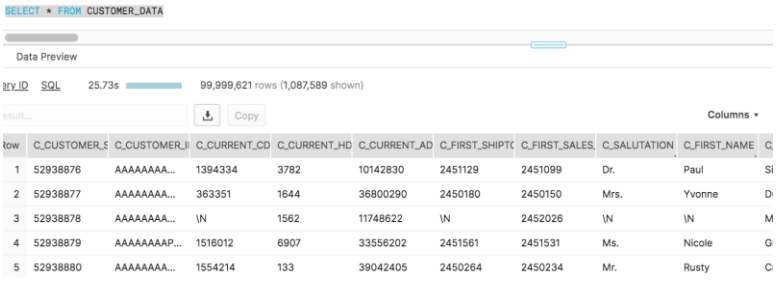
## 4. CREATE VIEW OVER S3 DATA

```
CREATE OR REPLACE VIEW CUSTOMER_DATA
AS
SELECT $1 C_CUSTOMER_SK,
$2  C_CUSTOMER_ID         ,
$3  C_CURRENT_CDEMO_SK        ,
$4  C_CURRENT_HDEMO_SK        ,
$5  C_CURRENT_ADDR_SK,
$6  C_FIRST_SHIPTO_DATE_SK     ,
$7  C_FIRST_SALES_DATE_SK       ,
```

```
$8  C_SALUTATION         ,
$9  C_FIRST_NAME         ,
$10 C_LAST_NAME,
$11 C_PREFERRED_CUST_FLAG    ,
$12 C_BIRTH_DAY ,
$13 C_BIRTH_MONTH        ,
$14 C_BIRTH_YEAR,
$16 C_LOGIN          ,
$17 C_EMAIL_ADDRESS    ,
$18 C_LAST_REVIEW_DATE
FROM @DEMO_DB.PUBLIC.MY_S3_STAGE/Customer_data/
(file_format => DEMO_DB.PUBLIC.MY_CSV_FORMAT)
```

### Query data directly on view,

SELECT * FROM CUSTOMER_DATA;




Now we can directly query data from s3 through view. What is the disadvantage of using this approach ? Can you see partitions being scanned in the backend ?

Now let's try to Join the view we created with a table on snowflake,

Create a sample snowflake table as below,

```
Create or replace transient table CUSTOMER_SNOWFLAKE_TABLE
AS
SELECT * FROM CUSTOMER_TEST limit 10000
```

Join this with the view we created earlier,

```
SELECT B.*
FROM CUSTOMER_SNOWFLAKE_TABLE B
LEFT OUTER JOIN
CUSTOMER_DATA A
ON
A.C_CUSTOMER_SK = B.C_CUSTOMER_SK
```

Now we successfully joined data in s3 with snowflake table. It may look simple but this approach has lot of potential. Can you mention few below,

page and observe the execution plan.

How many partitions got scanned from snowflake table :

## 5. UNLOAD DATA BACK TO S3

This approach leverages micro partitions in snowflake for lookup table still giving us the freedom to query data which we have stored in s3.

Once we are done looking up we can copy data back to s3 with new derived lookup column.

```
COPY INTO @DEMO_DB.PUBLIC.MY_S3_STAGE/Customer_joined_data/
```

```
from(
SELECT B.*
FROM CUSTOMER_SNOWFLAKE_TABLE B
LEFT OUTER JOIN
CUSTOMER_DATA A
ON
A.C_CUSTOMER_SK = B.C_CUSTOMER_SK
)
```

## 6. ADVANTAGES AND DISADVANTAGES

Write your views below,