Nama : Karno

Jurusan : Data Engineer 01

1. Menjalankan citus di docker compose

```
PS F:\altera_academy\try-citus> docker-compose -p citus up -d
[+] Running 29/9
 ✓ manager 7 layers [⣿⣿⣿⣿⣿⣿⣿⣿⣿⣿]      0B/0B      Pulled
 ✓ master 7 layers [⣿⣿⣿⣿⣿⣿⣿⣿⣿⣿]      0B/0B      Pulled
 ✓ worker 12 layers [⣿⣿⣿⣿⣿⣿⣿⣿⣿⣿⣿⣿⣿⣿⣿⣿]      0B/0B      Pulled









[+] Building 0.0s (0/0)
[+] Running 5/5
 ✓ Network citus_default                Created
 ✓ Volume "citus_healthcheck-volume"    Created
 ✓ Container citus_master               Started
 ✓ Container citus_manager              Started
 ✓ Container citus-worker-1             Started
PS F:\altera_academy\try-citus> docker exec -it citus_master bash
root@e4964ba980ab:/# psql -U mysuperuser -d postgres
psql (15.3 (Debian 15.3-1.pgdg120+1))
Type "help" for help.

postgres=# create extension citus;
CREATE EXTENSION
```

2. Perintah untuk membuat table biasa dan table columnar
   a. Table biasa

```
postgres=# CREATE TABLE events_biasa (
device_id bigint,
event_id bigserial,
event_time timestamptz default now(),
data jsonb not null
);
```

   b. Table columnar

```
postgres=# CREATE TABLE events_columnar (
device_id bigint,
event_id bigserial,
event_time timestamptz default now(),
data jsonb not null
)
USING columnar;
```

3. Masukkan 100 tabel data ke dalam table biasa dan table columnar
   a. Table biasa

```
postgres=# INSERT INTO events_biasa (device_id, data)
SELECT d, '{"hello":"table_biasa"}' FROM generate_series(1,100) d;
INSERT 0 100
```

   b. Table columnar

```
postgres=# INSERT INTO events_columnar (device_id, data)
postgres-# SELECT d, '{"hello":"columnar"}' FROM generate_series(1,100) d;
INSERT 0 100
```

4. Tampilkan perbedaan ukuran antara table biasa dan table columnar
   a. Table biasa

```
postgres=# select*from events_biasa limit 10;
 device_id | event_id |          event_time           |           data
-----------+----------+-------------------------------+-------------------------
         1 |        1 | 2023-11-01 08:06:23.483108+00 | {"hello": "table_biasa"}
         2 |        2 | 2023-11-01 08:06:23.483108+00 | {"hello": "table_biasa"}
         3 |        3 | 2023-11-01 08:06:23.483108+00 | {"hello": "table_biasa"}
         4 |        4 | 2023-11-01 08:06:23.483108+00 | {"hello": "table_biasa"}
         5 |        5 | 2023-11-01 08:06:23.483108+00 | {"hello": "table_biasa"}
         6 |        6 | 2023-11-01 08:06:23.483108+00 | {"hello": "table_biasa"}
         7 |        7 | 2023-11-01 08:06:23.483108+00 | {"hello": "table_biasa"}
         8 |        8 | 2023-11-01 08:06:23.483108+00 | {"hello": "table_biasa"}
         9 |        9 | 2023-11-01 08:06:23.483108+00 | {"hello": "table_biasa"}
        10 |       10 | 2023-11-01 08:06:23.483108+00 | {"hello": "table_biasa"}
(10 rows)
```

   b. Table columnar

```
postgres=# select*from events_columnar limit 10;
 device_id | event_id |          event_time           |         data
-----------+----------+-------------------------------+----------------------
         1 |        1 | 2023-11-01 08:04:44.570869+00 | {"hello": "columnar"}
         2 |        2 | 2023-11-01 08:04:44.570869+00 | {"hello": "columnar"}
         3 |        3 | 2023-11-01 08:04:44.570869+00 | {"hello": "columnar"}
         4 |        4 | 2023-11-01 08:04:44.570869+00 | {"hello": "columnar"}
         5 |        5 | 2023-11-01 08:04:44.570869+00 | {"hello": "columnar"}
         6 |        6 | 2023-11-01 08:04:44.570869+00 | {"hello": "columnar"}
         7 |        7 | 2023-11-01 08:04:44.570869+00 | {"hello": "columnar"}
         8 |        8 | 2023-11-01 08:04:44.570869+00 | {"hello": "columnar"}
         9 |        9 | 2023-11-01 08:04:44.570869+00 | {"hello": "columnar"}
        10 |       10 | 2023-11-01 08:04:44.570869+00 | {"hello": "columnar"}
(10 rows)
```

   C. perbedaan ukuran

```
postgres=# \dt+
                                    List of relations
 Schema |      Name       | Type  |    Owner    | Persistence | Access method | Size  | Descriptio
n
--------+-----------------+-------+-------------+-------------+---------------+-------+-----------
--
 public | events_biasa    | table | mysuperuser | permanent   | heap          | 48 kB |
 public | events_columnar | table | mysuperuser | permanent   | columnar      | 24 kB |
(2 rows)
```

5. Kesimpulan
   - Perintah untuk membuat table biasa dan columnar pada dasarnya sama, hanya saja pada table columnar ditambahkan “USING COLUMNAR”
   - Model, bentuk dan ukuran table sama

- Perbedaan terletak pada acces method atau jenis penyimpanan data tersebut. Table biasa disimpan dalam “heap” sedangkan table columnar disimpan dalam “columnar”.