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Deliverable D

Project Phase 3: OLAP Queries and BI Dashboard

Task Division

Part 1

Drill down and roll up - Sneha Slice - Marissa Dice - Tolu Combination - all

Part 2

Iceberg - Marissa Windowing queries -Sneha Window clause - Tolu

Part 3

Each add our queries to tableau

Part 1. Standard OLAP operations - 9 queries in total

a. Drill down and roll up. - 2 queries

- For instance, explore the total number of positive cases in your data mart; drill down to a month (April 2020), and drill down to a specific day.
- ii For instance, explore the total number of resolved cases in your data mart; drill down to a week (first week of April 2020), and drill down to a specific day.
- iii For instance, consider all the unresolved cases in Toronto City, roll up to GTA, and roll up to all data in your data mart.
- a) Drill down and roll up

```
SELECT COUNT(*), D.month, D.day
FROM fact table v2 as F, date as D
WHERE
F."Reported Date Key" = D.id AND
D.month = 4
GROUP BY (D.month, D.day)
ORDER BY D.month, D.day
SELECT COUNT(*), D.month, D.day
FROM fact table v2 as F, date as D
WHERE
F."Reported Date Key" = D.id AND
D.month = 4
AND F. "Resolved" = 'yes'
AND D.day IN (1,2,3,4,5,6,7)
GROUP BY (D.month, D.day)
ORDER BY D.month, D.day
SELECT COUNT(*), P.City
FROM fact table v2 as F, phu location as P
WHERE F."Resolved"= 'no'
AND F."PHU Key" = P.phu location id
GROUP BY ROLLUP(P.City)
ORDER BY P.City
```

- b. **Slice,** where only one dimension is selected. **2 queries**For instance, provide the (i) the number of cases in a specific PHU (resolved, unresolved and fatal), (ii) the number cases across the PHUs when a specific special measure was in place, (iii) the mobility levels in Ottawa, etc.
- b) Slice

Slice

1. Number of Cases in a Specific PHU

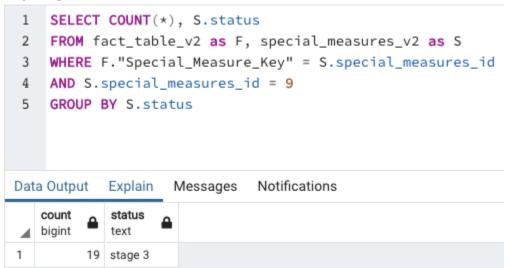
Toronto:



All Cities:



2. Number of Cases in PHUs when a specific Special Measure was in place Stage 3 Special Measure:



All Special Measures:

```
SELECT COUNT(*), S.status
FROM fact_table_v2 as F, special_measures_v2 as S
WHERE F."Special_Measure_Key" = S.special_measures_id
GROUP BY S.status
```

Data Output		Explain Messages Notifications
4	count bigint	status text
1	1752	stage 2 extended to toronto
2	581	Parks Re-opened
3	16	stage 3 extended to toronto
4	141	Stage 2 of reopening.
5	19	stage 3
6	8961	First State of Emergency
7	3786	Restart

- c. **Dice,** where one creates a sub-cube. **2 queries**For instance, (i) provide the number of fatal cases during a period of two months, e.g., February and March, in Peel and Ottawa, (ii) provide the number of unresolved cases when contrasting two mobility locations, e.g., parks and transit, in Peel and Ottawa.
- c) Tolu

DICE QUERY			
provide the number of fatal cases during a period of two Months in two PHU locations	SELECT P.city, COUNT(F."Fatal") FROM fact_table_v2 AS F, date AS D, phu_location as P WHERE F."Fatal"='no' AND D.month>=4 AND D.month <= 5 AND F."PHU_Key"=P."phu_location_id" AND P."phu_location_id" IN (2251, 3895) GROUP BY P.city		
provide the number of unresolved cases between Stage 1&2 of restart	SELECT S.status, COUNT(F."Resolved") FROM fact_table_v2 AS F, special_measures_v2 AS S WHERE F."Resolved"='no' AND S."special_measures_id"=F."Special_Measure_Key" AND S."special_measures_id" IN (7, 8, 11) GROUP BY S.status		

d. Combining OLAP operations. In these queries, we combine the above-mentioned operations. - 3 queries

For instance, we may aim to explore the number of cases i) during different periods of the year, ii) when certain types of measures are in place, iii) for different types of outcomes and weather conditions iv) contrasting mobility levels in Ottawa and Peel, v) comparing sunny versus rainy days, etc.

D.

i) num of deaths by city by month	SELECT D.month, P.city, COUNT(*), RANK() OVER(ORDER BY COUNT(*) DESC) FROM fact_table_v2 as F, date as D, phu_location AS P WHERE F."Reported_Date_Key"=D.id AND F."Fatal"='yes' AND P."phu_location_id"=F."PHU_Key" GROUP BY P.city, D.month LIMIT 10
ii) num of cases when weather	SELECT COUNT(*) as num_of_cases,
iii) num of cases when special measures	SELECT S.status, P.city, COUNT(*) FROM fact_table_v2 as F, special_measures_v2 as S, phu_location as P WHERE F."Special_Measure_Key" IN (2,9,10) AND S."special_measures_id"=F."Special_Measure_Key" AND F."PHU_Key"=P."phu_location_id" GROUP BY S.status, P.city

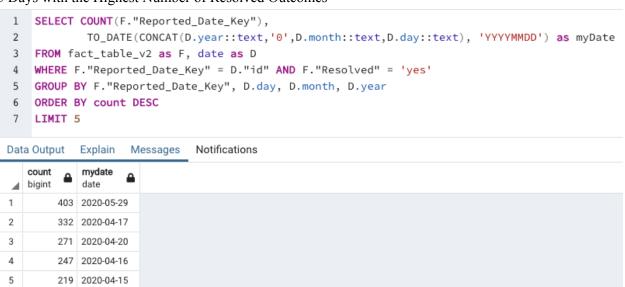
Part 2. Explorative operation - 3 queries

Identify general trends using advanced SQL operations. Give <u>one query</u> from each one of these categories.

- a. **Iceberg queries.** For instance, find the five days with the highest numbers of resolved outcomes, find the location with the highest mobility in terms of visits to parks, to grocery stores and pharmacies, etc.
- b. **Windowing queries.** For instance, show the ranking of the PHUs in terms of the number of cases per week, per outcome, per month, etc.
- c. **Using the Window clause.** For instance, compare the number of resolved cases in Ottawa to that of the previous and next months, etc.

a. Iceberg Query

5 Days with the Highest Number of Resolved Outcomes



B. Windowing queries

```
SELECT COUNT(*),P.City, D.month, F."Resolved",
RANK () OVER(ORDER BY COUNT(*) ASC) Rank
FROM fact_table_v2 as F, phu_location as P, date as D
GROUP BY ( P.City, D.month ,F."Resolved")
ORDER BY Rank;;
```

```
Query Editor Query History
     SELECT COUNT(*),P.City, D.month, F."Resolved",
             RANK () OVER(ORDER BY COUNT(*) ASC) Rank
 2
    FROM fact_table_v2 as F, phu_location as P, date as D
 3
    GROUP BY ( P.City, D.month ,F."Resolved")
    ORDER BY Rank;
 Data Output Explain
                        Messages
                                    Notifications
      count
                city
                                         month
                                                     Resolved
                                                                          rank
                                                                                 bigint
                character varying (80)
                                         numeric
                                                     character varying
                                                                          bigint
         44220 Toronto
 1
                                                   4 no
                                                                                  1
         44220 Ottawa
                                                                                  1
  2
                                                   6 no
         44220 Ottawa
  3
                                                   4 no
                                                                                  1
  4
         44220 Toronto
                                                   6 no
                                                                                  1
  5
         45694 Toronto
                                                   5 no
                                                                                  5
         45694 Ottawa
                                                   5 no
                                                                                  5
  6
         45694 Ottawa
  7
                                                   7 no
                                                                                  5
         45694 Toronto
                                                   7 no
                                                                                  5
  8
  9
         413460 Toronto
                                                                                  9
                                                   6 yes
                                                                                  9
         413460 Toronto
                                                   4 yes
 10
 11
         413460 Ottawa
                                                   4 yes
                                                                                  9
         413460 Ottawa
                                                                                  9
 12
                                                   6 yes
         427242 Ottawa
                                                                                 13
 13
                                                   7 yes
         427242 Ottawa
                                                   5 yes
                                                                                 13
 14
        427242 Toronto
                                                   7 yes
                                                                                 13
 15
 16
         427242 Toronto
                                                   5 yes
                                                                                 13
```

c) Window Clause

```
Query Editor Query History
    SELECT D.month, COUNT(F."Resolved") as resolvedCount, RANK() OVER W
1
    FROM fact_table_v2 as F, date as D
2
    WHERE F. "Resolved"='yes'
3
    GROUP BY D.month
 4
    WINDOW W AS (ORDER BY COUNT(F."Resolved"))
5
 6
Data Output
                                Notifications
            Explain
                    Messages
   month
               resolvedcount
                               rank
                               bigint
   numeric
               bigint
            6
                        413460
1
                                      1
2
            4
                        413460
                                      1
```

3

3

3

4

5

7

427242

427242

Part 3. BI dashboard and Information Visualisation (40 marks)

Create a dashboard that allows the users to explore the data and to visualise trends. Your interface should include graphs and charts. You are encouraged to use Tableau, or any other dashboard tool of your choice.

Please see Tableau workbook attached.