COMS4771 Project2

Peimou Sun ps3136 Ziren Xia zx2249

December 2020

1 PostgreSQL account: ps3136

2 An overview of the expansion

We have added two text attributes in our database. One is in the ’Comment’ table. We changed the type of ’details’ attribute from VARCHAR to text. The modification fits our project because now we can process the user’s comment details with text search functions and operators to get more details about how users feel about the policy. The other one is in the ’evaluation_suggestion’ type. The ’suggestion’ is of type text because the suggestion content size can be variable and sometimes can be very long.

We created a new composite type called ’evaluation_suggestion’ which includes an ENUM type and a text type. We create this composite type to fulfil the city evaluation function of our project.

The ’evaluation_suggestion’ attribute is used in ’City_evaluation’ table to record whether the city is of ’High risk’ or ’Low risk’ and the corresponding suggestions for the people there.

We created the trigger called ’update_city_evaluation’ because the Covid cases of cities are updating quickly so we need to reassess their risks every time they update their City data. The trigger will execute ’update_city_evaluation_func()’ to reassess the risk level with given suggestions(which used composite type ’evaluation_suggestion’) of the city and insert the tuple into ’City_evaluation’ table.

3 A detailed explanation for Trigger

We want to evaluate the risk of each city after the updates of new cases. We want to store the historical records of risk evaluations of each update of new_cases. After we update the new_cases in the city, the trigger will insert an evaluation into the evaluation_suggestion table. The logic of the evaluation can be summarized as:

$$eval = \begin{cases} \text{High risk}, & \text{if} \quad \frac{\text{new\_cases}}{\text{population}} > 0.1 \\ \text{Low risk}, & \text{if} \quad \frac{\text{new\_cases}}{\text{population}} \leq 0.1 \end{cases} \tag{1}$$

You can get more examples and test cases in Query 1 or UpdateCity.sql in the file path `~/COMS4111Project1/` in GCP.

4 Query examples

4.1 Query 1

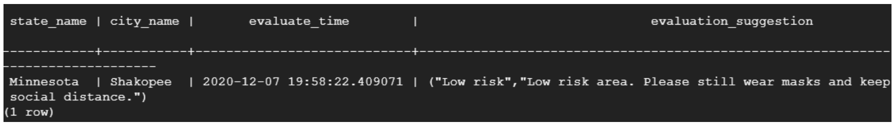
This query is a test for the trigger. The evaluation should be automatically added to the City_evaluation table. Note that Shakopee in Minnesota has 41570 population. Therefore, the new_cases will get a low risk evaluation.

The update command is:

```
UPDATE City SET new_cases=1000 WHERE city_name = ’Shakopee’
AND state_name = ’Minnesota’
```

After the action, we can check the result of trigger with following command:

```
SELECT * FROM City_evaluation WHERE city_name = ’Shakopee’ AND state_name=’Minnesota’
```



```
 state_name | city_name |       evaluate_time        |                              evaluation_suggestion

-----------+-----------+----------------------------+------------------------------------------------------------
--------------------
 Minnesota  | Shakopee  | 2020-12-07 19:58:22.409071 | ("Low risk","Low risk area. Please still wear masks and keep
 social distance.")
(1 row)
```

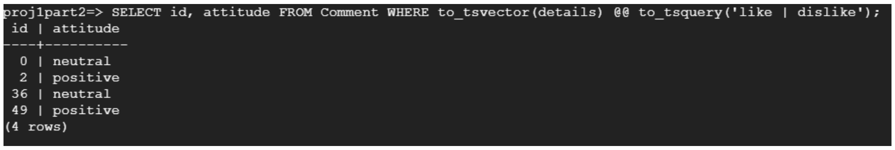
Figure 1: Test Case: An example with low risk

Note that we also check the table ”evaluation_suggestion”(composite type).

4.2 Query 2

This query is supposed to select the id and attitude of those comment that have word ’like’ or ’dislike’ in it.

```
SELECT id, attitude FROM Comment
WHERE to_tsvector(details) @@ to_tsquery(’like | dislike’);
```



```
proj1part2=> SELECT id, attitude FROM Comment WHERE to_tsvector(details) @@ to_tsquery('like | dislike');
 id | attitude
----+----------
  0 | neutral
  2 | positive
 36 | neutral
 49 | positive
(4 rows)
```

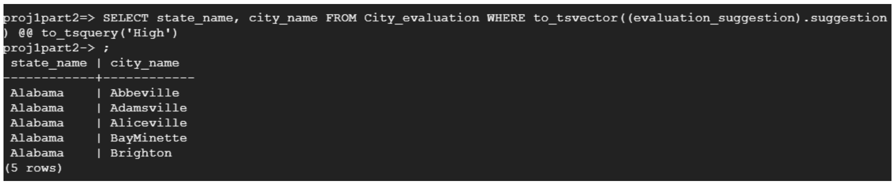
Figure 2: Test Case: An example with low risk

4.3 Query 3

This query check the text attribute ”suggestion” in evaluation_suggestion type.

```
SELECT state_name, city_name FROM City_evaluation WHERE
to_tsvector((evaluation_suggestion).suggestion) @@ to_tsquery(’High’)
```

The result is shown as follow:



```
proj1part2=> SELECT state_name, city_name FROM City_evaluation WHERE to_tsvector((evaluation_suggestion).suggestion
) @@ to_tsquery('High')
proj1part2-> ;
 state_name | city_name
------------+------------
 Alabama    | Abbeville
 Alabama    | Adamsville
 Alabama    | Aliceville
 Alabama    | BayMinette
 Alabama    | Brighton
(5 rows)
```

Figure 3: Test of text attribute in evaluation_suggestion