1.Úvod

Webová aplikácia zobrazuje reštaurácie a bary v Trenčíne a jeho širšom okolí. Používateľovi sú umožnené nasledujúce scenáre:

- vykreslenie barov a reštaurácií na mape
- zobrazenie reštaurácii v oblasti 10 km
- zobrazenie barov v oblasti 10 km
- zobrazenie 10 najbližších barov/reštaurácií vzhľadom na jeho polohu
- vykreslenie parkovísk v jeho okolí
- filtrovanie barov/reštaurácií podľa názvu
- zobrazenie detailu na klik

2.Ukážky Query

Zobrazenie 10 najbližších barov/reštaurácií podľa polohy používateľa:

```
SELECT row_to_json(fc) FROM
    ( SELECT 'FeatureCollection' AS type,
        array_to_json(array_agg(f)) AS features
        FROM (SELECT 'Feature' AS type,
            ST_AsGeoJSON(ST_Transform(way, 4326))::json AS geometry,
            row_to_json((osm_id, name, "addr:housename","addr:housenumber", amenity)) As properties
            FROM planet_osm_point
            WHERE amenity LIKE 'restaurant' OR amenity LIKE 'pub'
                AND ST_Distance_Sphere(ST_Transform(way, 4326), ST_MakePoint(18.0339, 48.8944)) <= 10000
                ORDER BY ST_Distance_Sphere(ST_Transform(way, 4326), ST_MakePoint(18.0339, 48.8944)) ASC
                LIMIT 10
        ) AS f
    ) AS fc;
```

Vykreslenie parkovísk v mojom okolí:

```
SELECT row_to_json(fc) FROM
    ( SELECT 'FeatureCollection' AS type,
        array_to_json(array_agg(f)) AS features
        FROM (SELECT 'Feature' AS type,
            ST_AsGeoJSON(ST_Transform(way, 4326))::json AS geometry,
            row_to_json((ST_Area(ST_Transform(way, 4326)::geography), name, access)) As properties
            FROM planet_osm_polygon
            WHERE amenity = 'parking'
            ORDER BY ST_Transform(way, 4326) <-> ST_GeomFromText('POINT(18.0339 48.8944)', 4326)::geography
            LIMIT 10
        ) AS f
    ) AS fc;
```

Filtrovanie barov/reštaurácií podľa názvu:

```
"SELECT row_to_json(fc) FROM
     ( SELECT 'FeatureCollection' As type,
        array_to_json(array_agg(f)) As features FROM
        (SELECT 'Feature' As type , ST_AsGeoJSON(ST_Transform(way, 4326))::json As geometry,
           row_to_json((osm_id,name,'"addr:housename"','"addr:housenumber"',amenity)) As properties
           FROM planet_osm_point
           where (amenity like 'restaurant' or amenity like 'pub')
           and name like %s
        ) As f
      )  As fc; ", [search_name]
```

Zobrazenie barov v oblasti 10 km:

```
SELECT row_to_json(fc) FROM
    ( SELECT 'FeatureCollection' AS type,
        array_to_json(array_agg(f)) AS features
        FROM (SELECT 'Feature' AS type,
            ST_AsGeoJSON(ST_Transform(way, 4326))::json AS geometry,
            row_to_json((osm_id, name, "addr:housename","addr:housenumber", amenity)) As properties
            FROM planet_osm_point
            WHERE amenity LIKE 'pub'
                AND ST_Distance_Sphere(ST_Transform(way, 4326), ST_MakePoint(18.0339, 48.8944)) <= 10000
        ) AS f
    ) AS fc;
```

3.Dáta

Dáta sú z Open Street Maps. Stiahnutý je Trenčín a jeho širšie okolie. Tieto dáta boli pomocou osm2pgsql naimportované do databázy.

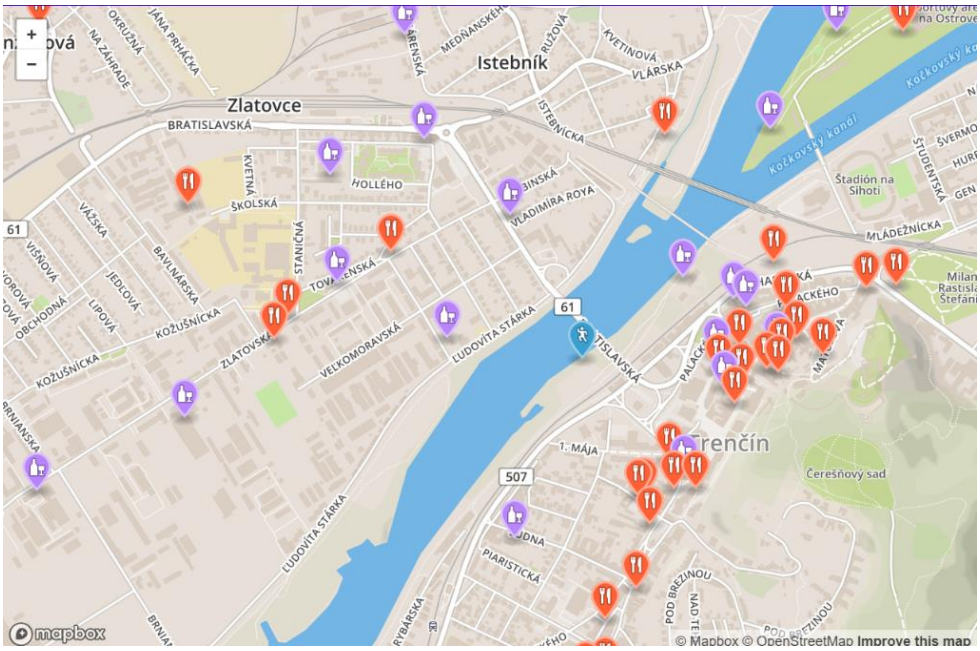
4.Indexy

Za účelom zrýchlenia dotazov je vytvorený index na stĺpci amenity, keďže sú z databázy vyberané iba riadky, ktorých amenity je buď "restaurant", alebo "pub". Ďalšie indexy sú vytvorené na stĺpci way v tabuľkách. Geojson je gengerovaný pomocou štandartnej funkcie st_asgeojson a všetky riadky sú spojené priamo v databáze do jedného geojsonu.

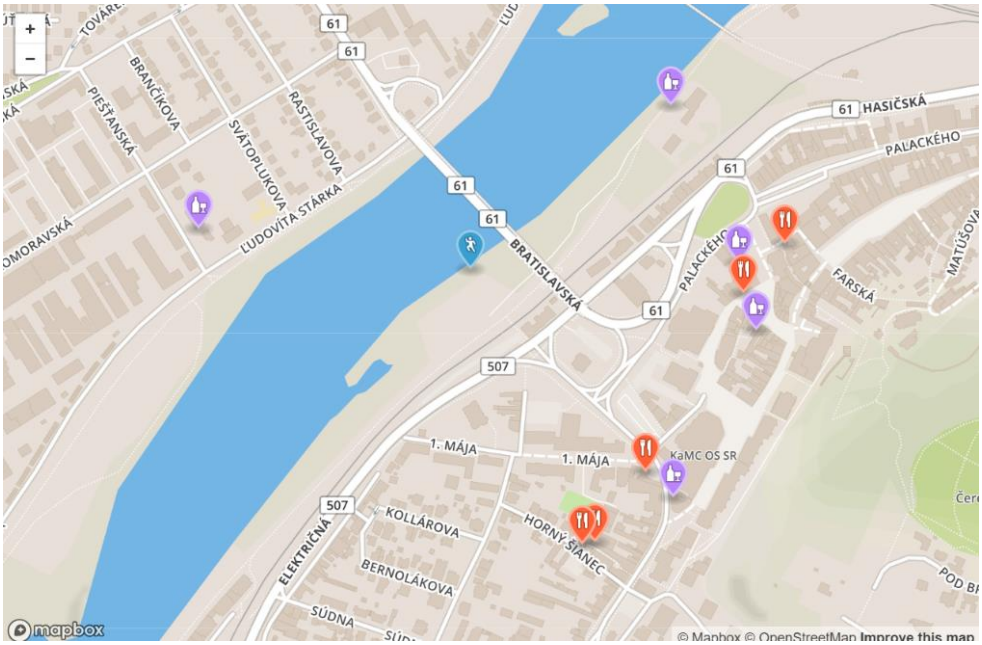
```
CREATE INDEX planet_osm_point_amenity
ON planet_osm_point (amenity);

CREATE INDEX planet_osm_line_gis
ON planet_osm_line
USING GIST (way);

CREATE INDEX planet_osm_polygon_gis
ON planet_osm_polygon
USING GIST (way);

CREATE INDEX planet_osm_point_gis
ON planet_osm_point
USING GIST (way);
```

5.Screenshoty z aplikácie

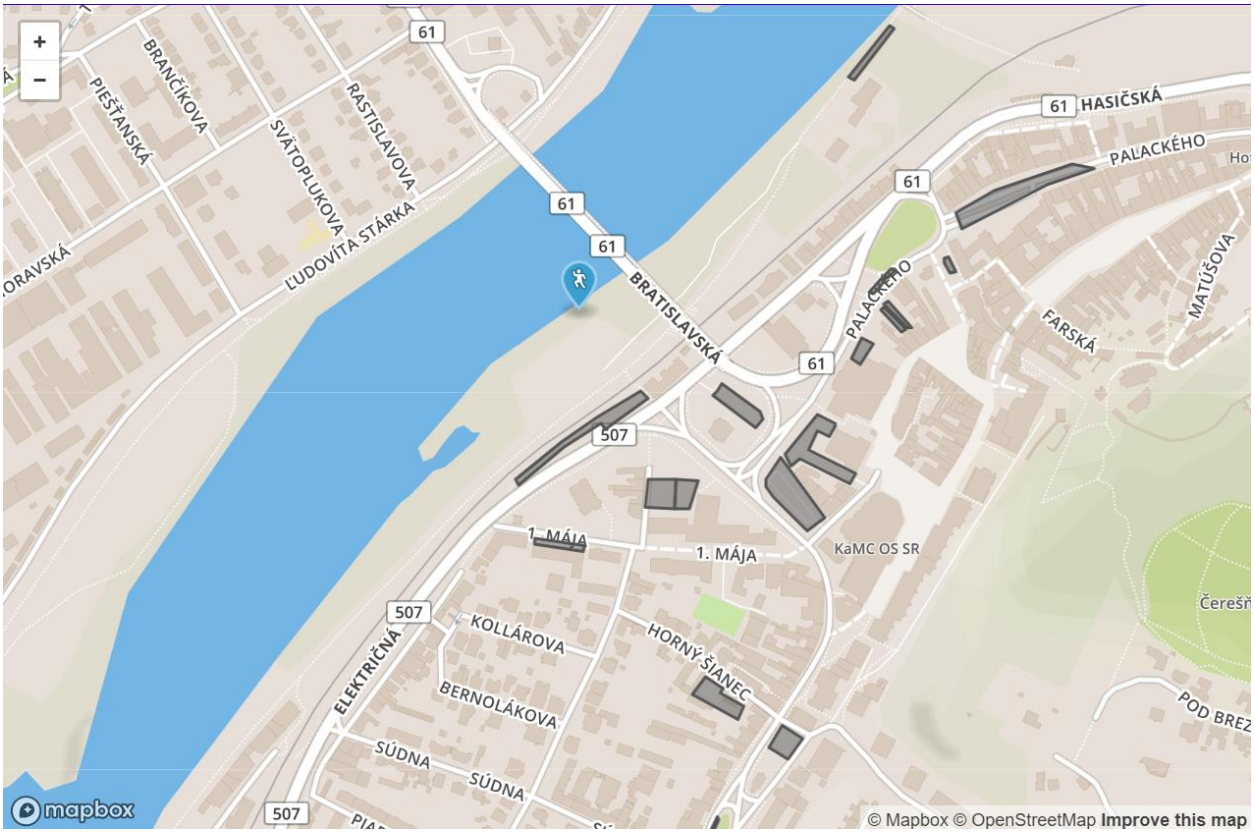
Zobrazenie barov/reštaurácii na mape:



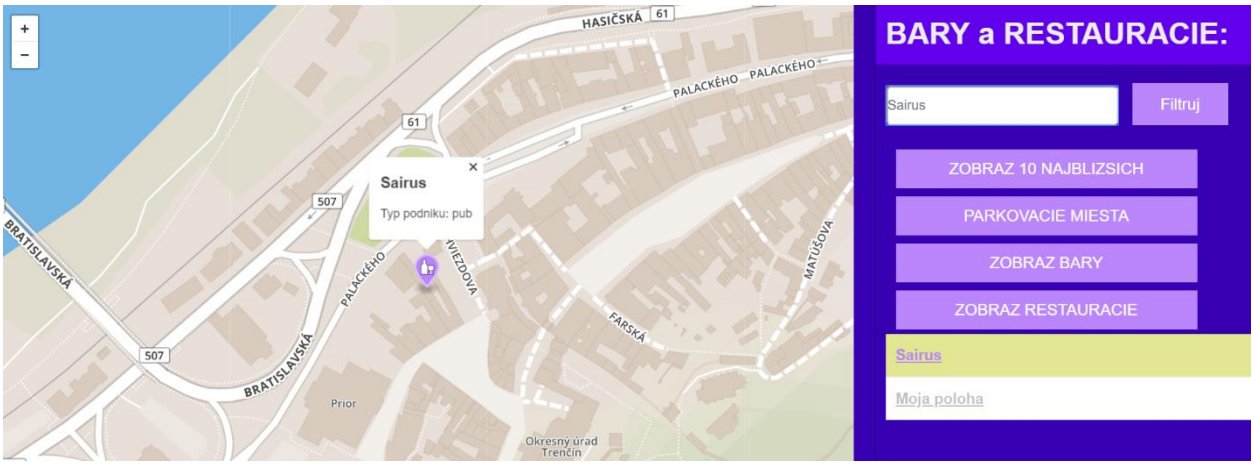
Zobrazenie 10 najbližších barov/reštaurácii podľa polohy používateľa:



Vykreslenie parkovísk v mojom okolí:



Filtrovanie barov/reštaurácii podľa názvu:



Zobrazenie barov v oblasti 10 km: