Weather Check- Canadian Cities

Project 3: Team -10

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Canada boasts of expansive uninhabited land that gives Canadians and visitors room to roam. Popular outdoor activities in Canada include camping, skiing, and snowboarding. There is therefore a need to enable tourists to plan for their journey. The team decided to design various interactive platforms to serve as a guide on weather conditions in Canada thereby facilitating planning trips in Canadian cities with ease

Research questions

- What can we draw from maps depicting the cities featuring different factors like temperature, Humidity ,pressure etc.
- To what extent do weather Parameters like pressure, humidity, rainfall Pressure, wind etc. affects the temperature of cities in Canada?
- Is there any difference in temperature of various cities and what factors affect them?
- What are we observing with Canada Weather Status App ?
- What can we glean from weather forecasts of different cities?

Data sources

- https://api.weather.gc.ca/

  https://worldpopulationreview.com/countries/cities/canada

- .https://api.weather.gc.ca/openapi?f=html3
- https://www.canada.ca/en/environment-climate-change/services/weather-general-tools-resources/how-we-use-observation-site/understanding-current-conditions-on-website.html
- https://en.wikipedia.org/wiki/Temperature_in_Canada
- https://www.kaggle.com/datasets/hemil26/canada-weather
- https://www.weatherapi.com/

Data Exploration and Scripting

Libraries/Dependencies:

- Flask powered API
- database -weather.db
- sqlites
- json
- plotly.graph_objs as go
- plotly.express as px
- plotly.offline as pyo
- html
- d3js
- leaflet

```
// Apply the group barmode to the layout
let layout = {
  title: "Weather Trends in Canadian Cities"
};

// Render the plot to the div tag with id "plot"
Plotly.newPlot("plot", traceData, layout);

};

// Call updatePlotly() when a change takes place to the DOM
d3.selectAll("#selDataset").on("change", updatePlotly);
var citi=[];
var temp =[];
var pres=[];
var hum =[];
var wind =[];
var windd=[];
var feels_like=[];

for(var i=0;i<cities.length;i++){
        row=cities[i];
        let bulk=row.city
        const options = {
        method: 'GET',
        url:`http://api.weatherapi.com/v1/current.json?key=29ad3cbdd70c4198ac704843231502 &q=${bulk}&.json`
        }

        const dataPromise = d3.json(options.url);
        console.log("Data Promise: ", dataPromise);
// Fetch the JSON data and console log it
        d3.json(options.url).then(function(data) {
    // console.log(data);

        if (data.location['country'] === 'Canada') {
            // console.log(data)
        citi.push(data.location['name']);
        // console.log(citi);
        temp.push(data.current['temp_c']);
        // console.log(temp);
        pres.push(data.current['pressure_in']);
        // console.log(pres);
        hum.push(data.current['humidity']);
        // console.log(hum);
        wind.push(data.current['wind_kph']);
        // console.log(wind);
        windd.push(data.current['wind_degree']);
        // console.log(windd);
        feels_like.push(data.current['feelslike_c']);
        // console.log(feels_like);
```

```
56          const options = {
57            method: 'GET',
58            url:`http://api.weatherapi.com/v1/current.json?key=29ad3cbdd70c
59          };
60
61          d3.json(options.url).then(function(data) {
62            console.log(element)
63            console.log(data)
64            if (data.location['country'] === 'Canada') {
65              marker = L.marker([data.location.lat, data.location.lon],{i
66              tooltip = L.tooltip()
67              .setLatLng([data.location.lat, data.location.lon])
68              .setContent(`<h6> ${data.current[element]} </h6>`).addTo(my
69              marker.bindPopup(`<h4> ${data.location["name"]} </h4>`).ope
70            }
71          });
```

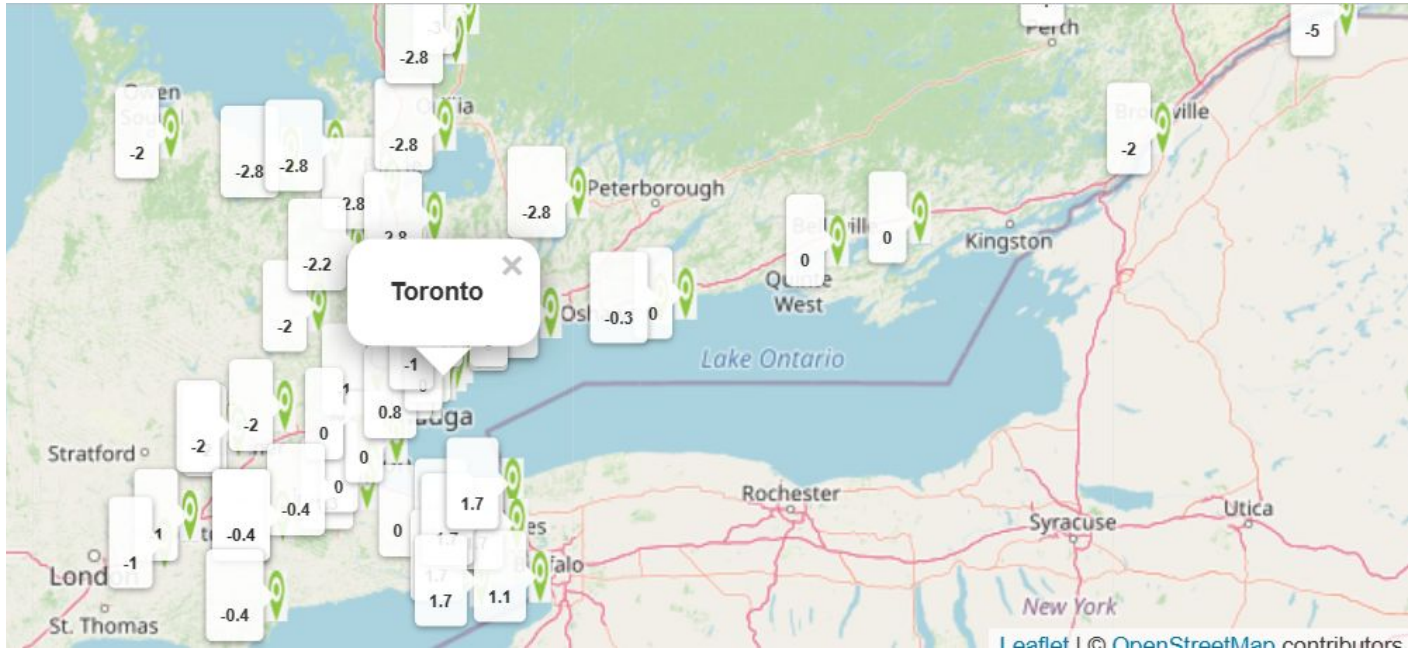
```
# create database
def get_db():
    db = getattr(g, "_database", None)
    if db is None:
        db = g._database = sqlite3.connect(DATABASE)
    return db


@app.teardown_appcontext
def close_db(exception):
    db = getattr(g, "_database", None)
    if db is not None:
        db.close()
```

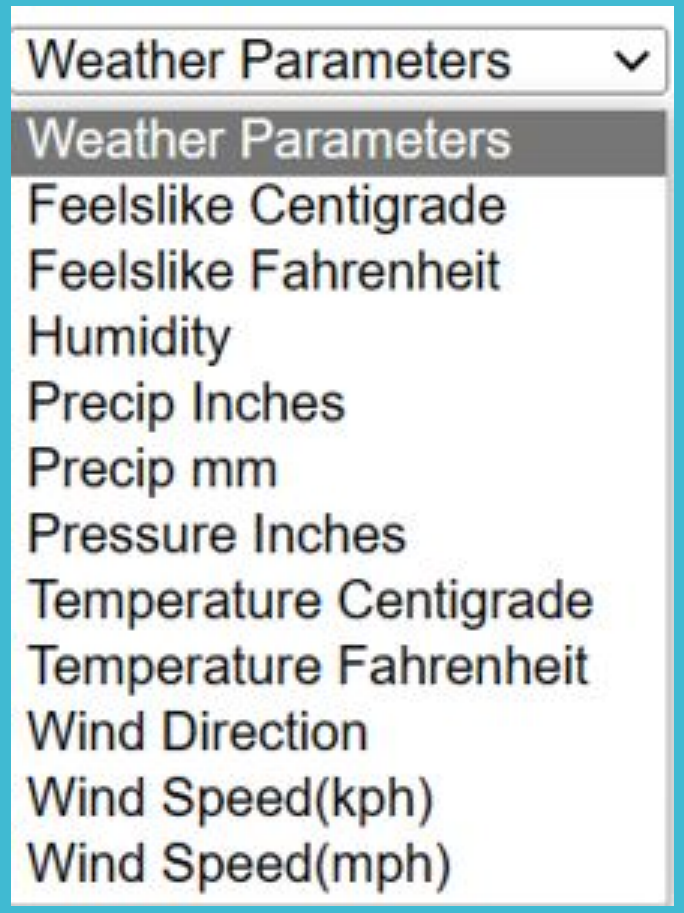
```
    )

    # render dashboard template with charts
    return render_template(
        "dashboard.html",
        temp_chart_form=temp_chart,
        weather_chart=weather_chart,
        weather_pie_chart=weather_pie_chart,
    )

if __name__ == "__main__":
    app.run(debug=True)
```

Canada Map with its cities

Canada Map showing dropdown menu with :

1. Temperature in Celsius
2. Temperature in Fahrenheit
3. Feels like
4. Humidity
5. Precipitation
6. Pressure
7. Wind



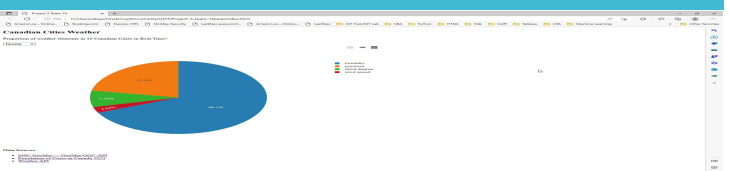


Climate Canada

Westerly winds, blowing from the sea to the land, are the prevailing air currents in the Pacific and bring coastal British Columbia heavy precipitation and moderate winter and summer temperatures. Inland, the Great Lakes moderate the weather in both southern Ontario and Quebec [1]. Using Leaflet, we were able to create a map where the user can choose any of the elements on the drop down menu and see the live value for all the cities across Canada and see how the factors impact the weather parameters in different parts of Canada.

[1] Encyclopædia Britannica, inc. (n.d.). *Soils and plant and Animal Life*. Encyclopædia Britannica. Retrieved February 26, 2023, from https://www.britannica.com/place/Canada/Soils-and-plant-and-animal-life

Weather elements in 10 Canadian Cities in Real Time!

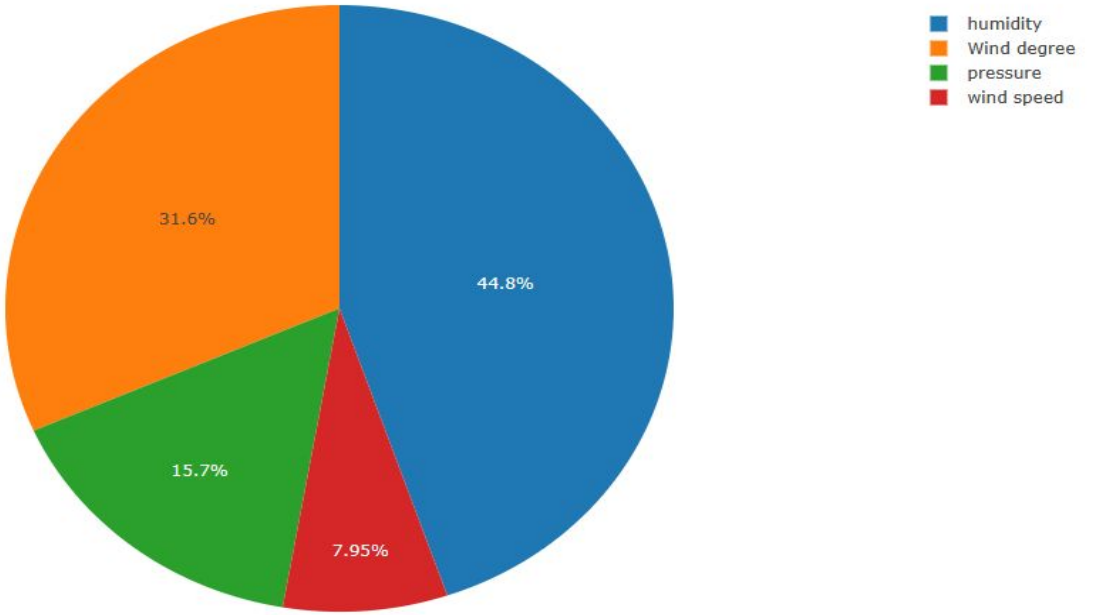


Canadian Cities Weather

Proportion of weather elements in 10 Canadian Cities in Real Time!

Quebec

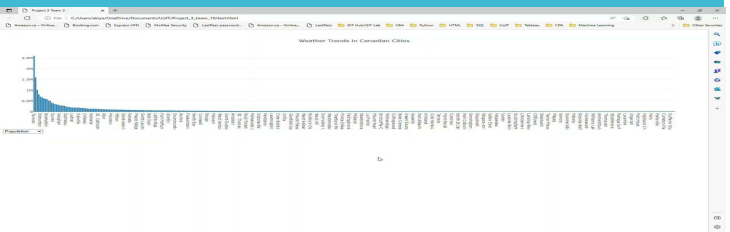
- Toronto
- Oakville
- Quebec
- Winnipeg
- Ottawa
- Montreal
- Quebec
- Calgary
- Brampton
- Vancouver

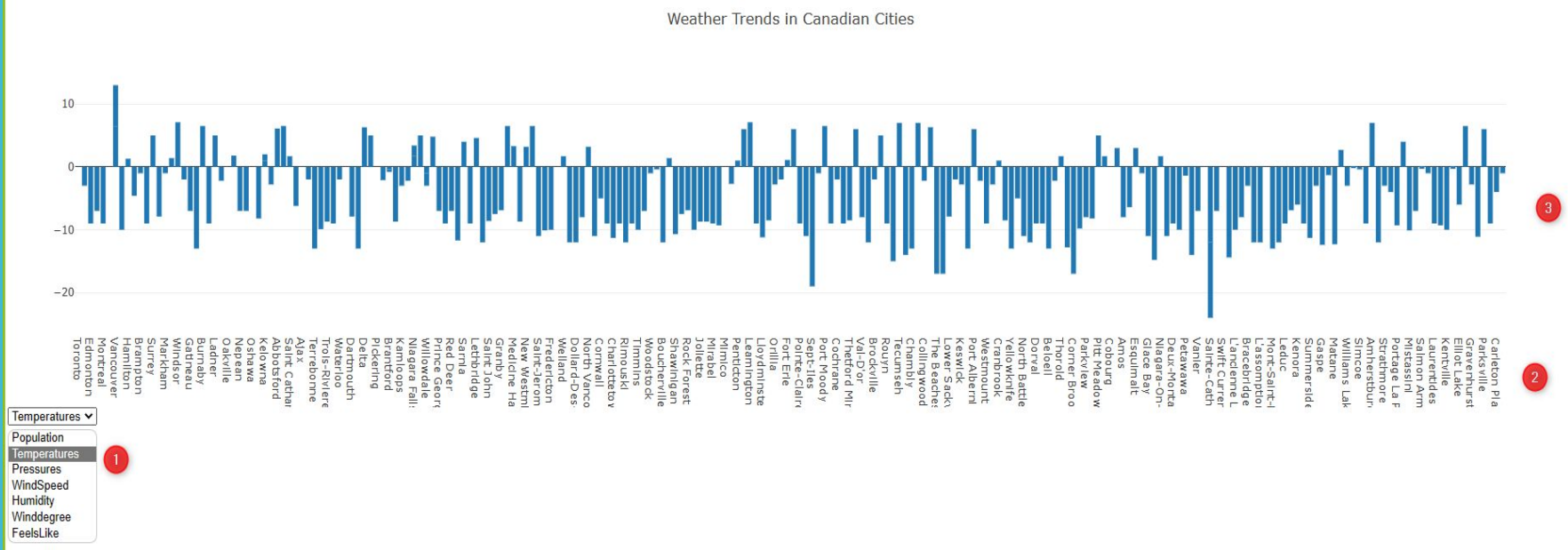


Data Sources:

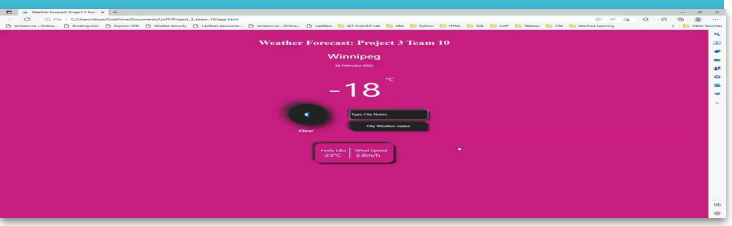
- MSC GeoMet — GeoMet-OGC-API
- Population of Cities in Canada 2023
- Weather API

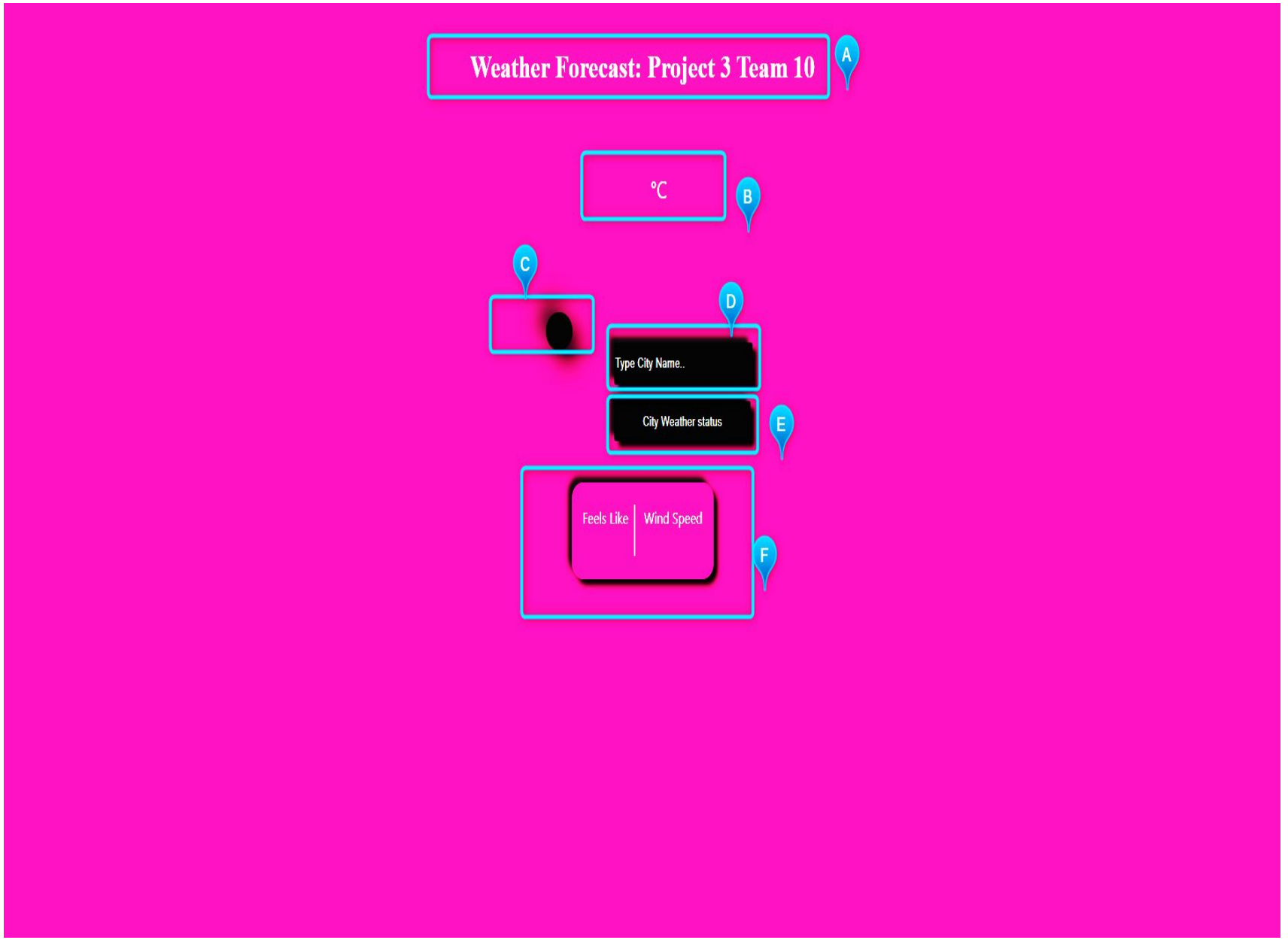
Cities Weather Exploration





Canadian City Weather App



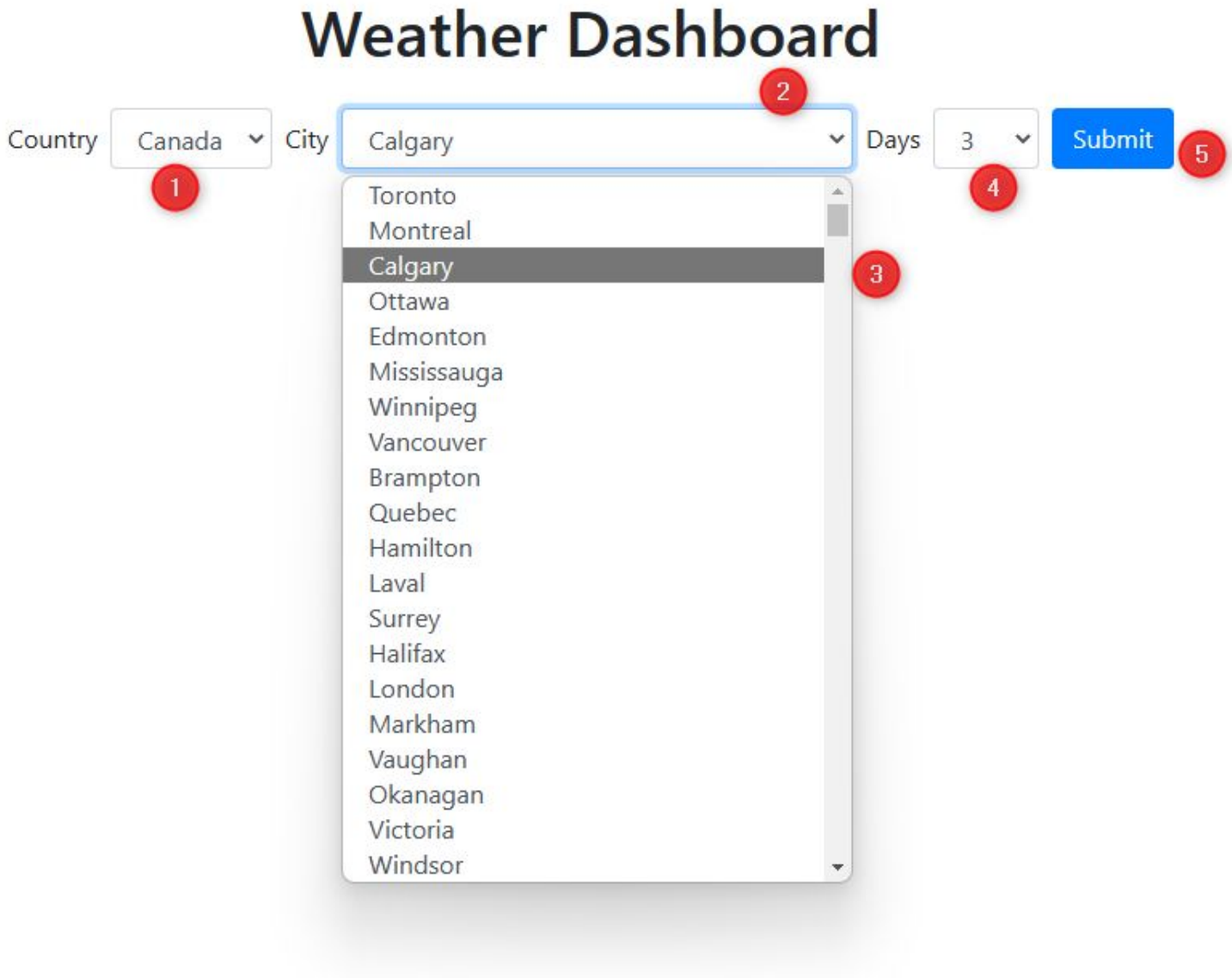


WEATHER DASHBOARD

Flask powered API

Initialize the database

sql database



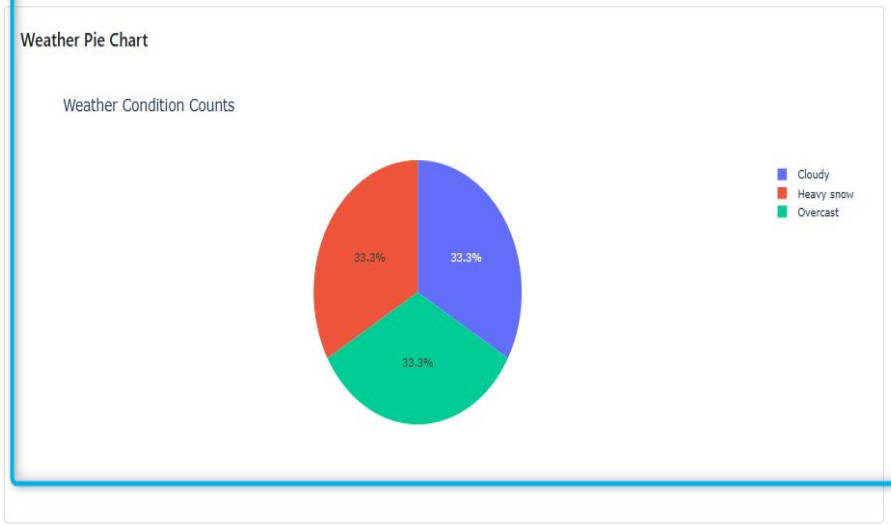
Weather Forecast

WEATHER DASHBOARD

Flask powered API

Initialize the database

sql database



Questions ?

Thank You!