

# Find Your Ideal Park in Mecklenburg County!!



*Leaflet*

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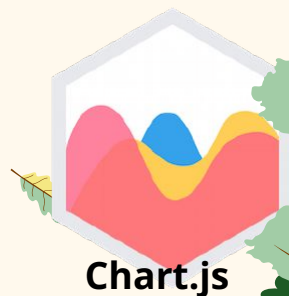


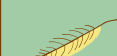
Chart.js



mongoDB



# OUR GOAL

Is to help our users find the ideal park that best suits their needs

<b><u>Backend</u></b>	Our visualization includes a Python Flask-powered API, HTML/CSS, JavaScript, and MongoDB database.
<b><u>Frontend</u></b>	Our Mecklenburg County Parks dashboard page includes multiple charts that all update from the same dataset.
<b><u>JS Library</u></b>	The dashboard displays park zip codes using the charts.js library that updates when a specific city is selected.
<b><u>Dataset</u></b>	It is powered by a dataset containing records for 365 parks.
<b><u>User-driven interaction</u></b>	Our dashboard uses a drop down menu to filter parks by city with a zoom feature that centers the map.. Markers are also color coded to display parks with and without playgrounds.
 <b><u>Views</u></b>	The visualization includes a Leaflet map with a tile layer from OpenStreetMaps for location, a chart with park zip codes, a filtered list of park amenities, and an amenities gauge to show the average number of amenities.





# Project Flow

01

## Data Cleaning & Merging

Using Python, we cleaned and merged two CSV datasets

02


## MongoDB/Flask API

We stored our final data set into a MongoDB server and used it to build our Python Flask API

03

## HTML/CSS


We styled the initial layout of the dashboard according to our proposal sketch



04

## Updated Lat/Lon

Converted the State Plane Coordinates to Lat/Lon to display our parks using Leaflet and OpenStreetMaps



05


## The Gauge

Calculated the average number of park amenities

06

## Dashboard Sync

Code modification and merging so that all charts update together on the dashboard



# Data Cleaning & Merging

## (Steps)



1

```
park_data = pd.read_csv("Park_Database.csv")
```

park_data														
	PARK_ID	parkname	address	streetno	streetdir	streetnm	streettype	streetsuff	city	state	...	trirunning	grnwyaaces	handball
0	CMCP	Campbell Creek Park	6601 BARCLIFF DR, CHARLOTTE, NC 28212	6601	NaN	BARCLIFFE	DR	NaN	CHARLOTTE	NC	...	No	No	No
	PENN	Charles and Ida Graham Park	8101 OLIVER HAGER RD, HUNTERSVILLE, NC 28078	0	NaN	NaN	NaN	NO	HUNTERSVILLE	NC	...	No	No	No
	FIVE	Five Points Park	200 FRENCH ST, CHARLOTTE, NC 28216	200	NaN	FRENCH	ST	NO	CHARLOTTE	NC	...	No	No	No

2

```
park_df = park_data.drop(columns = ["streettype", "streetno", "streetdir", "streetnm", "streetsuff", "prkstatus", "prktype", "city"])
```

park_df														
	PARK_ID	parkname	address	city	state	zip	park district	prkphone	x	y	...	shadearbor	shuffboard	trirunning
0	CMCP	Campbell Creek Park	6601 BARCLIFF DR, CHARLOTTE, NC 28212	CHARLOTTE	NC	28212	South	9803141003	1481781.309	537915.1491	...	No	No	No

3

```
property_data = pd.read_csv("Park_Property.csv")
```

	PARK_TYPE	STATUS	PARK_ID	PROPERTY	SUM_ACRES	ShapeSTArea	ShapeSTLength
	ADMINISTRATION	DEVELOPED	ADMN	ADMINISTRATIVE OFFICE BLDG	11.787335	5.134541e+05	4779.715617
	AQUATIC CENTER	DEVELOPED	AQUA	MECKLENBURG COUNTY AQUATIC CENTER	4.111445	1.790937e+05	1808.868298
	AQUATIC CENTER	DEVELOPED	WOOD	DOUBLE OAKS FAMILY AQUATIC CENTER	2.487135	1.083391e+05	1399.690158
	COMMUNITY PARK	DEVELOPED	ARDD	ALFEMEVA ROAD PARK	31.434477	0.304705e+06	6677.6558

4

```
property_df = property_data.drop(columns= ["OBJECTID", "STATUS", "PROPERTY"])
```

property_df						
	PARK_TYPE	PARK_ID	SUM_ACRES	ShapeSTArea	ShapeSTLength	
0	ADMINISTRATION	ADMN	11.787335	5.134541e+05	4779.715617	

5

```
merge_df = pd.merge(park_df, property_df, how="left", on=["PARK_ID", "PARK_ID"])
```

merge_df										
	PARK_ID	parkname	address	city	state	zip	park district	prkphone		
0	CMCP	Campbell Creek Park	6601 BARCLIFF DR, CHARLOTTE, NC 28212	CHARLOTTE	NC	28212	South	9803141003	1481	



# Final CSV Database



PARK_ID	Park Name	Address	City	State	Zip Code	Park District	Park Phone #	Longitude	Latitude	...	handball	arts	multiuserm	playsw
0	CMCP	Campbell Creek Park	6601 BARCLIFF DR, CHARLOTTE, NC 28212	CHARLOTTE	NC	28212	South	9803141003	1481781.309	537915.1491	...	No	No	No
1	PENN	Charles and Ida Graham Park	8101 OLIVER HAGER RD, HUNTERSVILLE, NC 28078	HUNTERSVILLE	NC	28078	North	7047662220	1433550.731	616092.1017	...	No	No	No
2	FIVE	Five Points Park	200 FRENCH ST, CHARLOTTE, NC 28216	CHARLOTTE	NC	28216	Central	9803141002	1444767.370	550517.4028	...	No	No	No

- Merged general park information with property information on PARK\_ID
- Data for 365 parks
- 52 final columns



City of Charlotte Open Data Portal

Open Mapping

Mecklenburg County GIS, North Carolina



# MongoDB Powered by a Python FLASK

```
from flask import Flask, jsonify
from flask_cors import CORS
from pymongo import MongoClient


app = Flask(__name__)
CORS(app)

# Connect to the MongoDB database
client = MongoClient("mongodb://127.0.0.1:27017/?directConnection=true&serverSelectionTimeoutMS=2000&appName=mongosh+1.10.5")
db = client["parks_db2"]
collection = db["parks"]

# Define a route to retrieve park data
@app.route('/', methods=['GET'])
def get_parks():
    # Query the MongoDB collection and exclude the MongoDB _id field
    parks = list(collection.find({}, {'_id': 0}))
    return jsonify(parks)

if __name__ == '__main__':
    app.run(host="0.0.0.0", debug=True, port=5000)
```

```
"Acres": 20.71639639,
"Address": "6601 BARCLIFF DR, CHARLOTTE, NC 28212",
"Area": 902402.5667,
"City": "CHARLOTTE",
"Latitude": 35.2155775,
"Length": 4365.287342,
"Longitude": -80.7351434,
"PARK_ID": "CMCP",
"PARK_TYPE": "COMMUNITY PARK",
"Park District": "South",
"Park name": "Campbell Creek Park",
"Phone": 9803141003,
"Zip Code": 28212,
"adacomply": "No",
"ampitheatre": "No",
"aquaticctr": "No",
"arts": "No",
"ballfield": "No",
"basketball": "No",
"batingcage": "No",
"bicyclelctr": "No",
"bmtrack": "No",
"boating": "No",
"bocciball": "No",
"camping": "No",
"concesstnd": "No",
"confcenter": "No",
"discgolf": "No",
"dockpier": "No",
"dogpark": "No",
"enviromedu": "No",
"firepit": "No",
"fishing": "No",
"fitness": "No",
"flwrgarden": "No",
"funbrella": "No",
"gaaball": "No",
"arden": "No",
"no
```

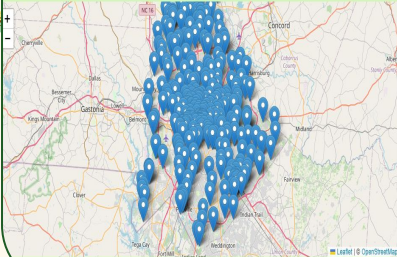




# The Park Map

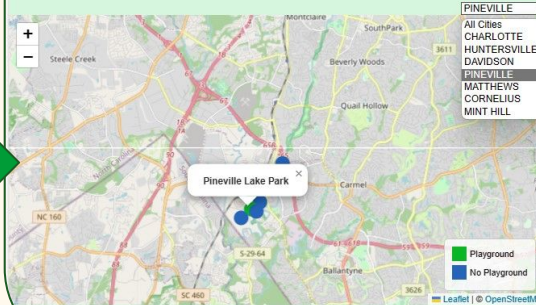
## Parks in Mecklenburg County

Filter Parks by City



## Parks in Mecklenburg County

Filter Parks by City



Park Info

### Pineville Lake Park

Phone Number: 7048892400

More Info: [Website](#)

909 LAKEVIEW DR, PINEVILLE, NC 28134

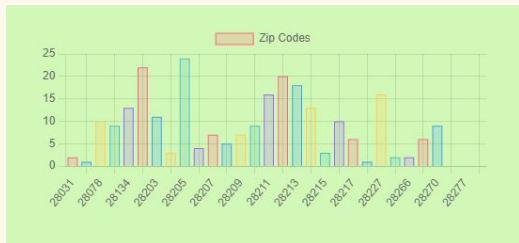
### Amenities at the Park:

- Restroom
- Basketball
- Walking Trail
- Dogpark
- Fitness
- Play Swings
- Parking



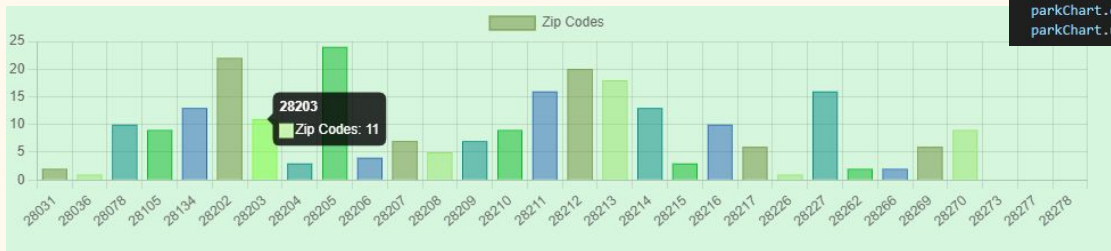


# Chart.js/Live Demo



```
const allZip = data.map(park => {  
  return park["Zip Code"]; // Return zipcodes  
});  
createParkChart(allZip);
```

```
// Filter data by park based on selected city  
const selectedZip = data.filter(park => {  
  return park.City === selectedCity;  
})  
.map(park => {  
  return park["Zip Code"]; // Return zipcodes  
});  
createParkChart(selectedZip);
```



```
else {  
  parkChart.data.datasets[0].data = Object.values(zipCounts);  
  parkChart.data.labels.data = Object.values(zipCounts);  
  parkChart.update();  
}
```



# Amenity List/Live Demo

```
// Display Individual Park Info When Selected
function updateParkInfo(park) {
  // Change Park Name When park marker is clicked
  let element = document.getElementById("parkName");
  element.innerHTML = park.Park_name;
  // Change park link
  element = document.getElementById("parkSite");
  element.innerHTML = "More Info: " + '<a href="' + park.parkurl + '">Website</a>';
  // Change park Street Name
  element = document.getElementById("parkStreet");
  element.innerHTML = park.Address;
  // Change park Phone
  element = document.getElementById("parkNum");
  element.innerHTML = "Phone Number: " + park.Phone;
  // Change park Type
  element = document.getElementById("parkType");
  element.innerHTML = park.PARK_TYPE;
}
```

## Park Info

### Sheffield Park

#### NEIGHBORHOOD PARK

Phone Number: 9803141003

More Info: [Website](#)

1311 TARRINGTON AV, CHARLOTTE, NC 28205

## Amenities at the Park:

- Picnic Area
- Basketball
- Tennis
- Walking Trail
- Play Swings
- Parking

# HTML/CSS

```
<body>
  <!-- Title of Page-->
  <h1>Parks in Mecklenburg County</h1>
  <div class="row">
    <!--First Row, First Column-->
    <div class="column" id="map-container">
      <h2>Filter Parks by City</h2>
      <div style="text-align: right;"><select id="CityDropdown" style="margin-left: 100px;">
        | | <option value="all">All Cities</option>
      </select>
      </div>
      <!-- The div that holds our map -->
      <div id="map" style="width: 100%; height: 400px;"></div>
      <!-- The div that holds the chart -->
      <div id="chart-container" class="column" style="width: 100%;">
        <canvas id="parkChart" width="500" height="200"></canvas>
      </div>
    </div>
    <!--First Row, Second Column-->
    <div class="column">
      <!--Update Park Info as Marker is Selected-->
      <h2>Park Info</h2>
      <h3 id="parkName">Click on a marker to view Park Info.</h3>
      <h4 id="parkType"></h4>
      <h5 id="parkNum"></h5>
      <h5 id="parkSite"></h5>
      <h5 id="parkStreet"></h5>
      <h2>Amenities at the Park:</h2>
      <ul id="amenities">Select a Park to view the amenities!</ul>
    </div>
  </div>
  <div class="row">
    <div class="column">
      <h2>Average Park Amenities Meter</h2>
      <!-- Place for the Gauge chart -->
      <div id="gaugeDiv" style="width: 100%; height: 400px;"></div>
    </div>
  </div>
```

```
/* Create three equal columns that float next to each other */
.column {
  float: left;
  width: 50%;
}

/* Clear floats after the columns */
.row:after {
  content: "";
  display: table;
  clear: both;
}

/* Responsive layout - makes the three columns stack on top of each other instead of next to each other on smaller screens (600px wide or less) */
@media screen and (max-width: 600px) {
  .column {
    width: 100%;
  }
}

/* Footer */
.footer {
  background-color: #f1f1f1;
  text-align: right;
  padding: 20px;
}

/* CSS for map container */
#map-container {
  float: center;
  width: 50%;
  height: 50%;
}

/* CSS for filter container */
#filter-container {
  float: left;
  width: 30%;
  padding: 20px;
  background-color: #f0f0f0;
}
```

# Amenity Gauge Creation

```
JS logic.js
static > js > JS logic.js > ...
145     });
146
147     // Calculate the average amenities across all parks
148     let totalAmenitiesCount = 0;
149     data.forEach(park => {
150       totalAmenitiesCount += displayAmenities(park);
151     });
152     const averageAmenities = Math.round(totalAmenitiesCount / data.length);
153
154     // Create and display the average amenities meter
155     const averageAmenityMeterHtml = createAmenityMeter(averageAmenities);
156     const averageAmenityMeterDiv = document.createElement('div');
157     averageAmenityMeterDiv.id = 'averageAmenityMeter';
158     averageAmenityMeterDiv.innerHTML = `
159       <h3>Average Park Amenities</h3>
160       ${averageAmenityMeterHtml}
161     `;
162     document.body.appendChild(averageAmenityMeterDiv);
163
164   })
165   .catch(error => {
166     console.error('Error fetching data:', error);
167   });
168 });
169
170 // Gauge Chart
171 var data = [
172   {
173     domain: { x: [0, 1], y: [0, 1] },
174     value: 2, // Updated value to 2
175     title: { text: "Park Amenities: 2/14" }, // Updated title to display
176     type: "indicator",
177     mode: "gauge+number",
178     gauge: {
179       axis: {
180         range: [null, 14] // Set the maximum range of the gauge
181       }
182     }
183   }
184 ];
185
186 var layout = { width: 600, height: 500, margin: { t: 0, b: 0 } };
```

# Amenity Gauge Live Demo

## Filter Parks by City



## Pineville Lake Park

Phone Number: 7048892400

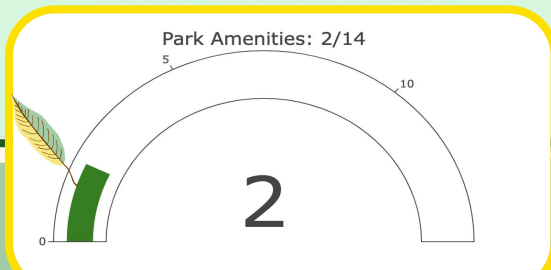
More Info: [Website](#)

909 LAKEVIEW DR, PINEVILLE, NC 28134

- Restroom
- Basketball
- Walking Trail
- Dogpark
- Fitness
- Play Swings
- Parking



## Average Park Amenities Meter

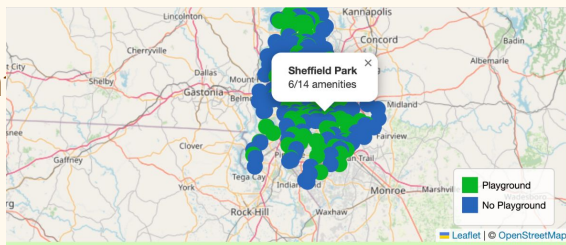
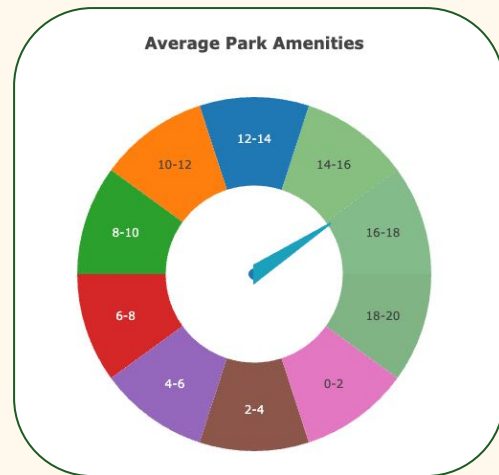


## MongoDB/Data Challenges

to Latitude	to Longitude	Zone	Easting	Northing	Zone Northing Easting Interpreted
35.2155775	-80.7351434	3200	1481781.309	537915.1491	3200 537915.1491UsFtN 1481781.309UsFtE
35.427915	-80.901609	3200	1433550.731	616092.1017	3200 616092.1017UsFtN 1433550.731UsFtE
35.2483572	-80.859839	3200	1444767.37	550517.4028	3200 550517.4028UsFtN 1444767.37UsFtE
35.2077241	-80.8931507	3200	1434541.767	535919.8546	3200 535919.8546UsFtN 1434541.767UsFtE
35.2150855	-80.8709127	3200	1441233.649	538472.5893	3200 538472.5893UsFtN 1441233.649UsFtE
35.3918623	-80.7765131	3200	1470575.237	602282.2271	3200 602282.2271UsFtN 1470575.237UsFtE
35.2373696	-80.8905099	3200	1435535.911	546692.186	3200 546692.186UsFtN 1435535.911UsFtE
35.263262	-80.8493734	3200	1447992.449	555882.6367	3200 555882.6367UsFtN 1447992.449UsFtE
35.1877331	-80.8585006	3200	1444753.845	528449.9938	3200 528449.9938UsFtN 1444753.845UsFtE

- Created twice due to updating the original CSV file
- State Plane Coordinates from out original dataset were converted in Lat/Lon
- parks\_db2 was born

## Gauge Challenges



More Info: [Website](#)

1311 TARRINGTON AV, CHARLOTTE, NC 28205

### Amenities at the Park:

- Picnic Area
- Basketball
- Tennis
- Walking Trail
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- Parking



# Thank you!

What questions  
do you have?

