

Data Engineering Project

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# NORTH CAROLINA ELEMENTAL EXCURSIONS

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Embrace the Weather with  
Every Step



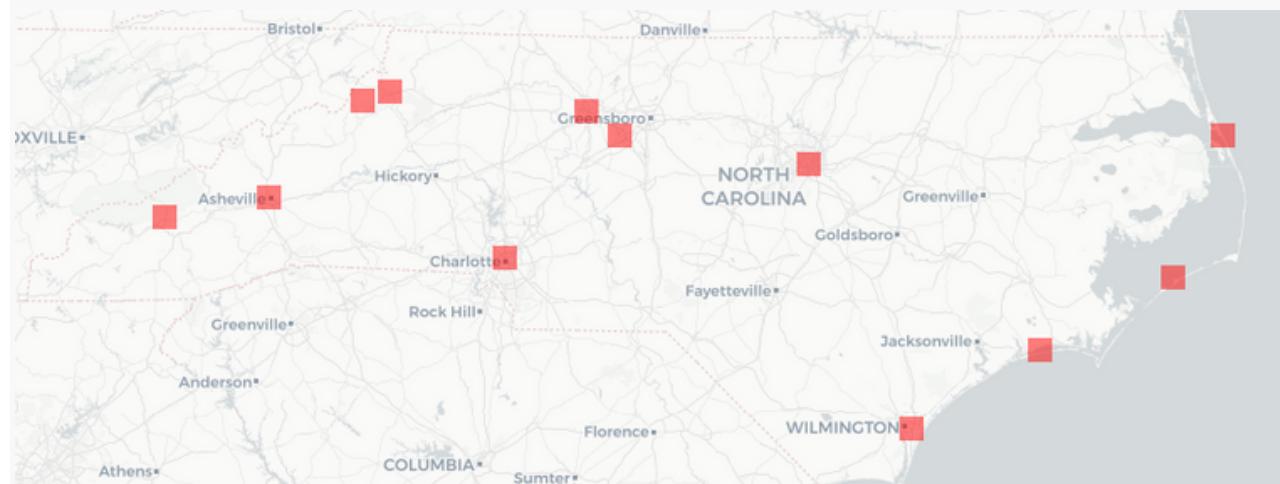
## SUMMARY

This analysis offers key weather insights, aiding North Carolina travelers in planning. Calculated seasonal averages reveal nuanced weather dynamics. Which empowers informed decision-making and enhances appreciation of diverse weather conditions across North Carolina's cities



	city_id	City	Latitude	Longitude
0	nc01	Asheville	35.592900	-82.557733
1	nc02	Banner Elk	36.163360	-81.872085
2	nc03	Boone	36.216749	-81.676003
3	nc04	Charlotte	35.230328	-80.843840
4	nc05	Cherokee	35.477081	-83.318739
5	nc06	Emerald Isle	34.679916	-76.954833
6	nc07	High Point	35.955408	-80.007097
7	nc08	Nags Head	35.957688	-75.620907
8	nc09	Ocracoke	35.113422	-75.986980
9	nc10	Raleigh	35.782718	-78.635695
10	nc11	Wilmington	34.210462	-77.883399
11	nc12	Winston-Salem	36.100357	-80.246209

Each group member chose 2 of their favorite destination spots in NC





## DATA WRANGLING

Using Visual Crossing Weather API, historical weather data (from January 1, 2023, to December 31st, 2023) for 12 North Carolina Cities was exported into CSV files.

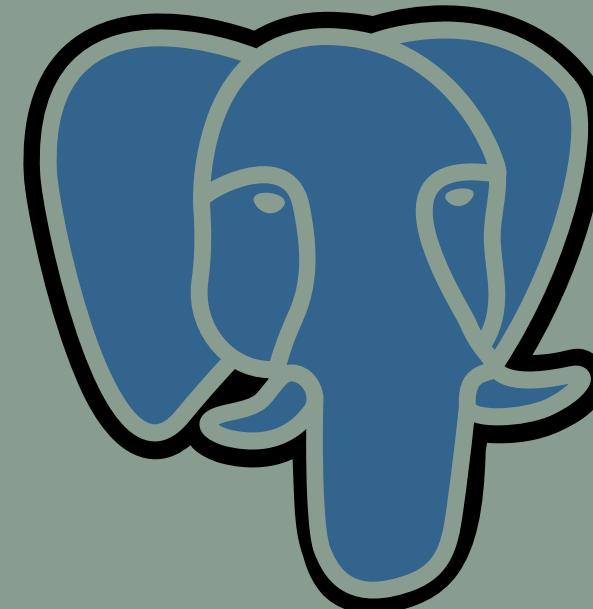
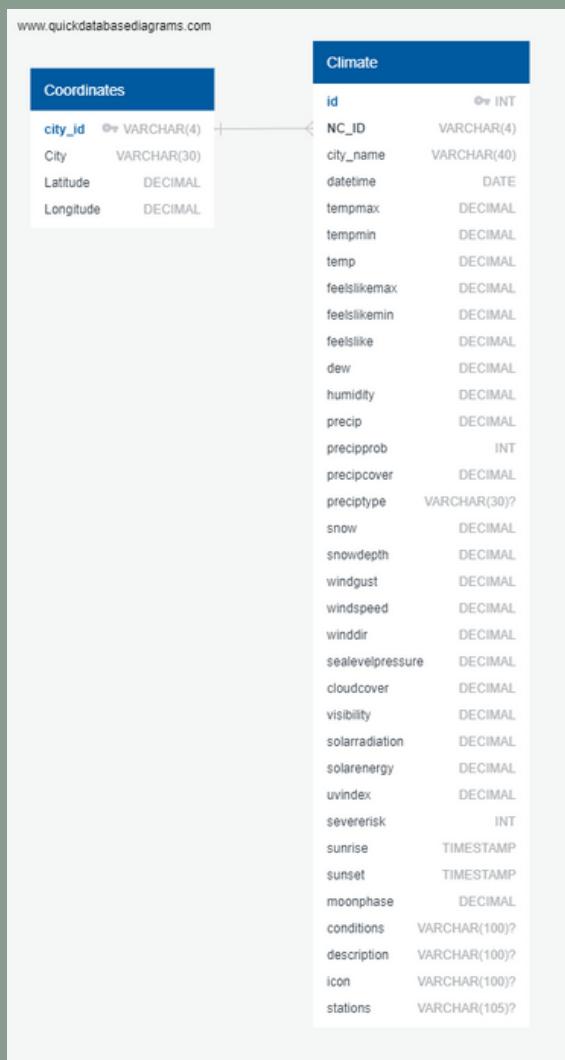
Using Google Maps, we collected coordinate data for the 12 cities of interest.

Python was used to combine the 12 weather data CSV files into a singular file (combined\_csv) and each city was assigned a unique NC\_ID number.

# DATA WRANGLING

```
34 combined_df = pd.concat(df_list, ignore_index=True)
35
36 # create a new index
37 combined_df["id"] = combined_df.index + 1
38
39 # create a dictionary for city names to NC_ID
40 city_mapping = {
41     'Asheville': 'nc01',
42     'Banner Elk': 'nc02',
43     'Boone': 'nc03',
44     'Charlotte': 'nc04',
45     'Cherokee': 'nc05',
46     'Emerald Isle': 'nc06',
47     'High Point': 'nc07',
48     'Nags Head': 'nc08',
49     'Ocracoke': 'nc09',
50     'Raleigh': 'nc10',
51     'Wilmington': 'nc11',
52     'Winston-Salem': 'nc12'
53 }
54
55 # iterate through the cities and update the 'NC_ID' column
56 for city, nc_id in city_mapping.items():
57     combined_df.loc[combined_df['name'].str.contains
58                     | [city, case=False, na=False], 'NC_ID'] = nc_id
59
60 # Move columns to front
61 first_column = combined_df.pop('id')
62 second_column = combined_df.pop('NC_ID')
63
64 combined_df.insert(0, 'id', first_column)
65 combined_df.insert(1, 'NC_ID', second_column)
66
```

# DATA STORAGE





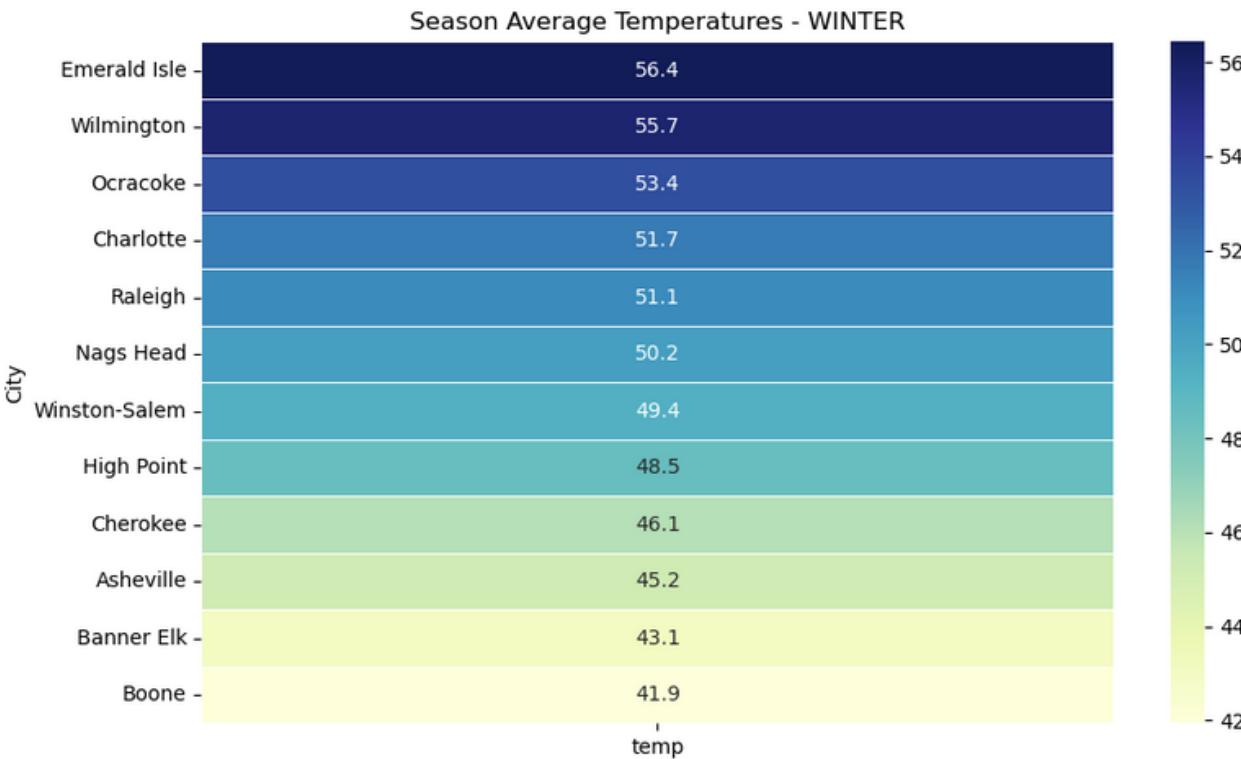
# CODING APPROACH TECHNIQUES

To create visuals the following libraries were used:  
Pandas, GeoPlotLib, MatPlotLib, GeoPandas,  
Seaborn



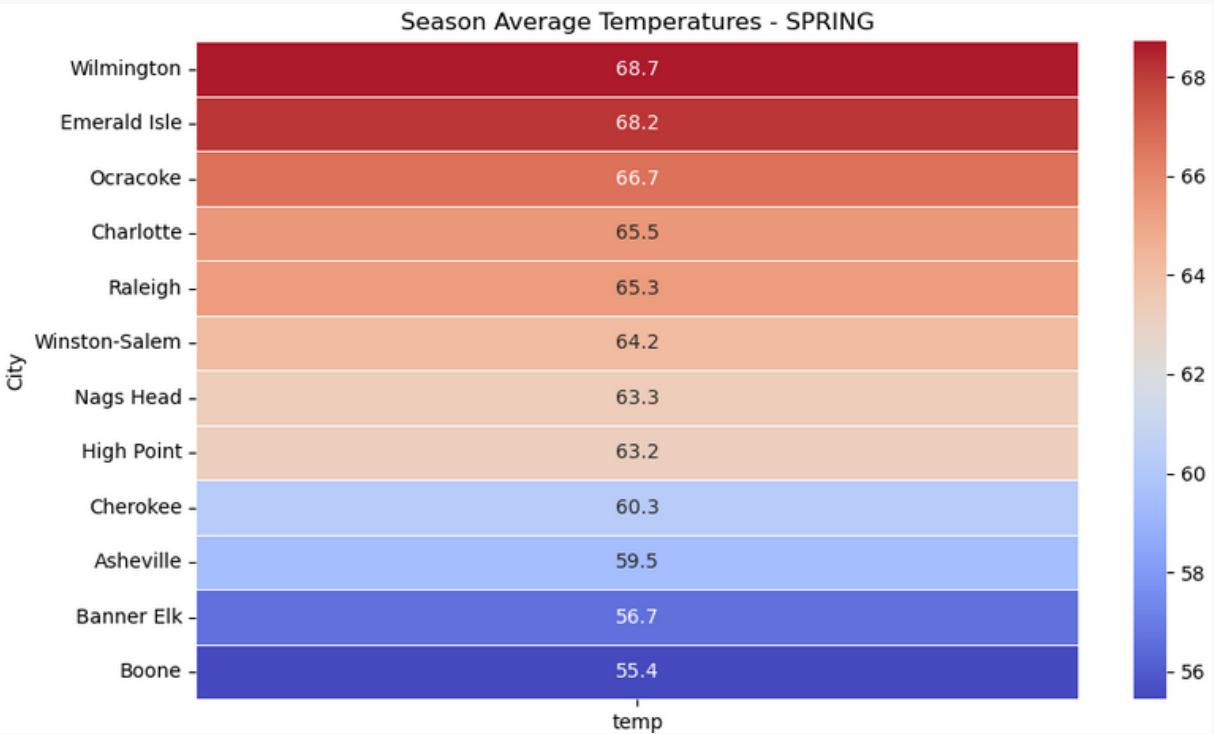
# WINTER

Embrace the crisp of winter with cooler temperatures, lower humidity, and the enchanting possibility of snowfall. Engage in the season's delights through mountain adventures, Holiday Festivals, captivating Historical Tours and so much more.



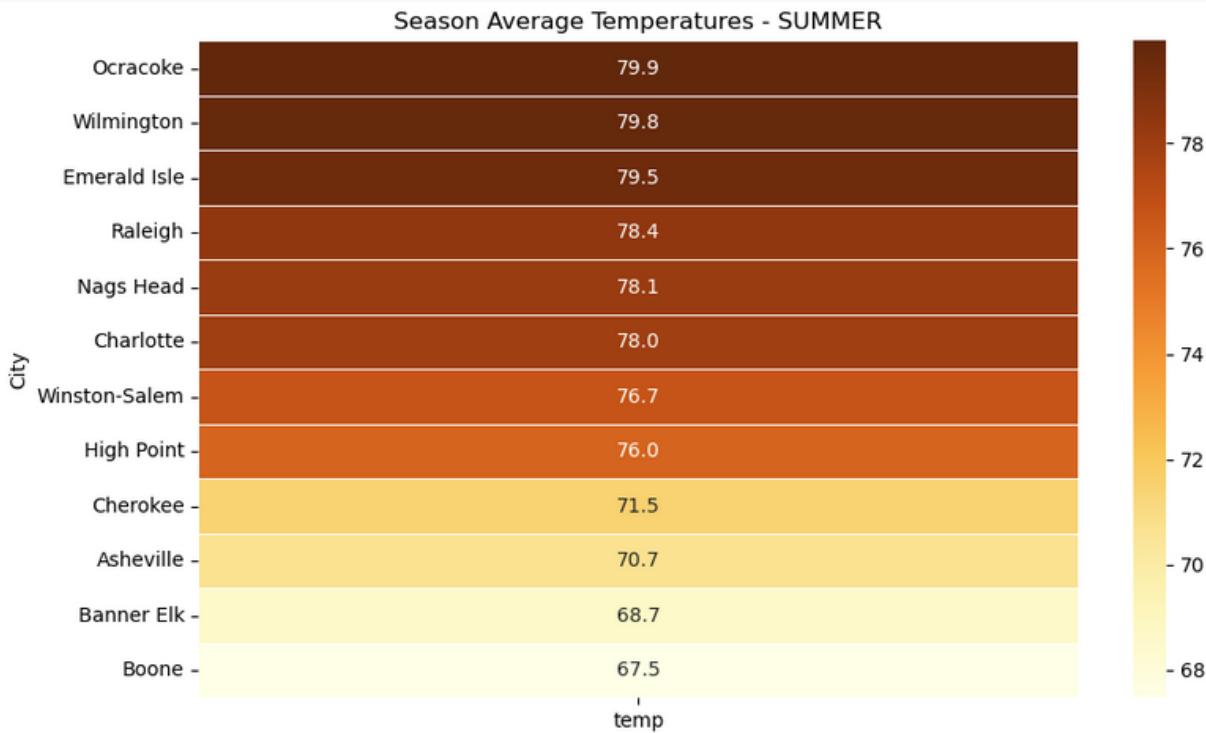
# SPRING

Moderate humidity and occasional precipitation create an enjoyable outdoor climate. North Carolina's spring, featuring scenic parks, festivals, and awakening ecosystems, invites enthusiasts to savor the charm of renewal.



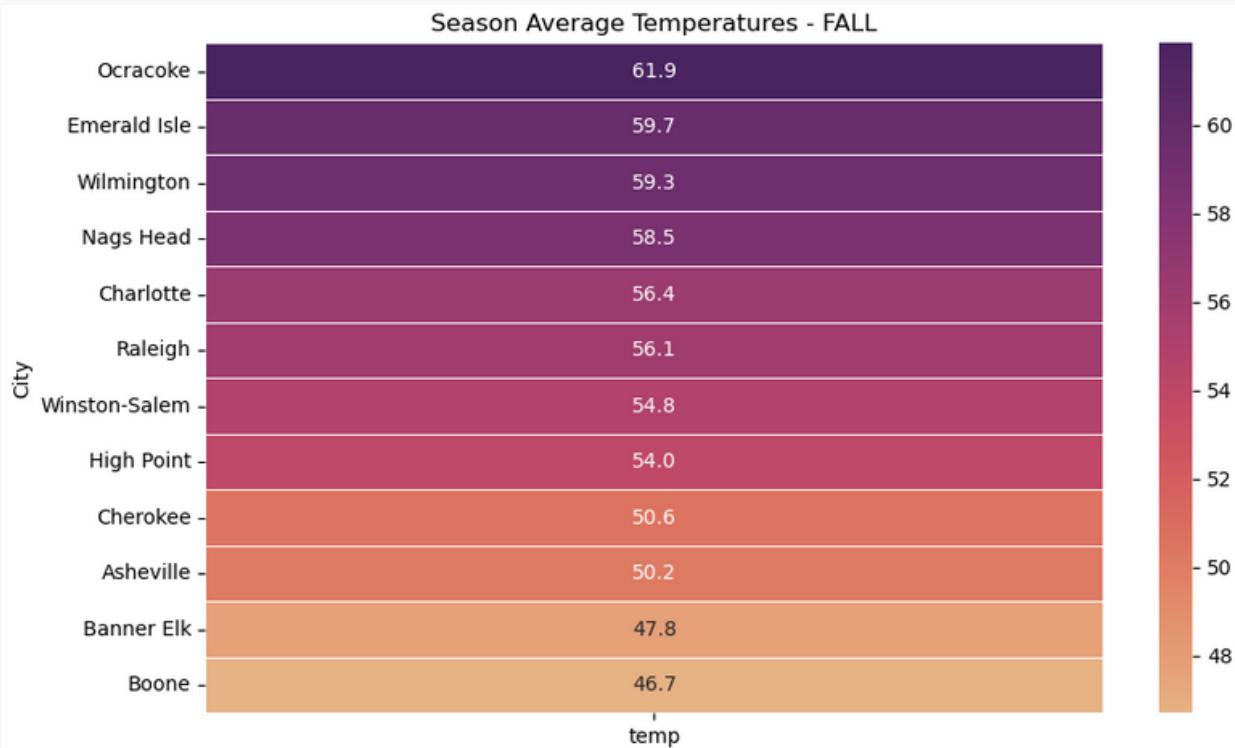
# SUMMER

Savor the warmth of summer with its golden sun and lively energy. Immerse yourself in refreshing outdoor adventures, vibrant festivals, and endless exploration. Keep hydrated, as humidity reaches its peak during this season.



# FALL

With potential shifts in precipitation, fall offers a scenic backdrop for outdoor activities. The crisp air and vibrant colors create an inviting atmosphere, inviting residents and visitors alike to experience the essence of autumn in North Carolina.



# AVERAGE DAILY TEMPERATURES (2023)



jupyter Average Temperature Line Chart Last Checkpoint: 2 minutes ago (unsaved changes) Logout

File Edit View Insert Cell Kernel Widgets Help Trusted Python 3 (ipykernel) ●

In [5]:

```
print("Please select three North Carolina cities from the following list to compare average daily temperatures from 2023.")  
print("_____  
print("When prompted, please enter the appropriate city ID.")  
print("_____  
print("Asheville - nc01")  
print("Banner Elk - nc02")  
print("Boone - nc03")  
print("Charlotte - nc04")  
print("Cherokee - nc05")  
print("Emerald Isle - nc06")  
print("High Point - nc07")  
print("Nags Head - nc08")  
print("Ocracoke - nc09")  
print("Raleigh - nc10")  
print("Wilmington - nc11")  
print("Winston-Salem - nc12")  
  
Please select three North Carolina cities from the following list to compare average daily temperatures from 2023.  
_____  
When prompted, please enter the appropriate city ID.  
_____  
Asheville - nc01  
Banner Elk - nc02  
Boone - nc03  
Charlotte - nc04  
Cherokee - nc05  
Emerald Isle - nc06  
High Point - nc07  
Nags Head - nc08  
Ocracoke - nc09  
Raleigh - nc10  
Wilmington - nc11  
Winston-Salem - nc12
```

In [\*]:

```
city1 = input("What is the first city ID you would like to search? ")  
city2 = input("What is the second city ID you would like to search? ")  
city3 = input("What is the third city ID you would like to search? ")  
combined_cities = (str(city1) + " | " + str(city2) + " | " + str(city3))  
  
What is the first city ID you would like to search? |
```

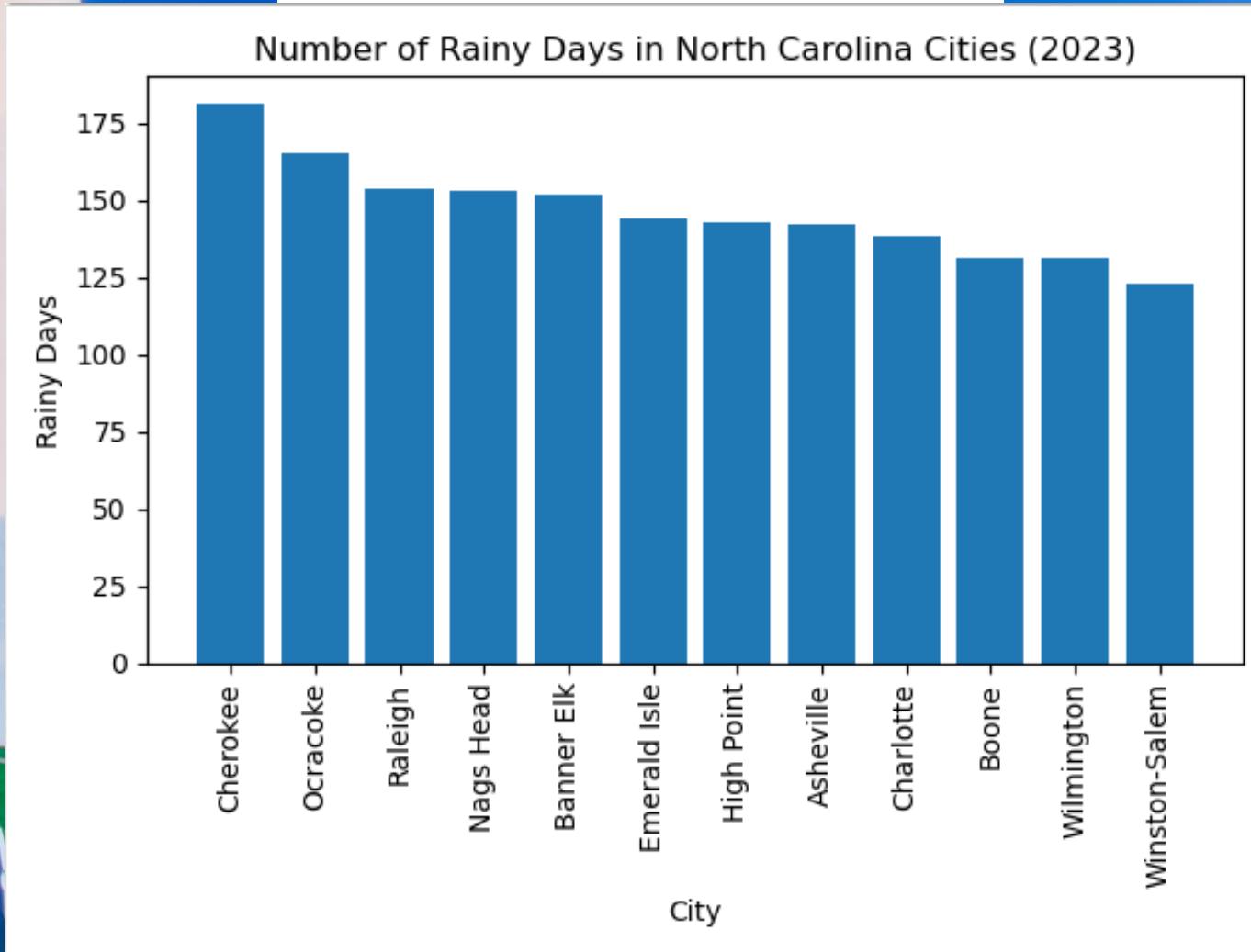
In [\*]:

```
filtered_df = combined_df[combined_df["city_id"].str.contains(combined_cities)]  
filtered_df
```

In [\*]:

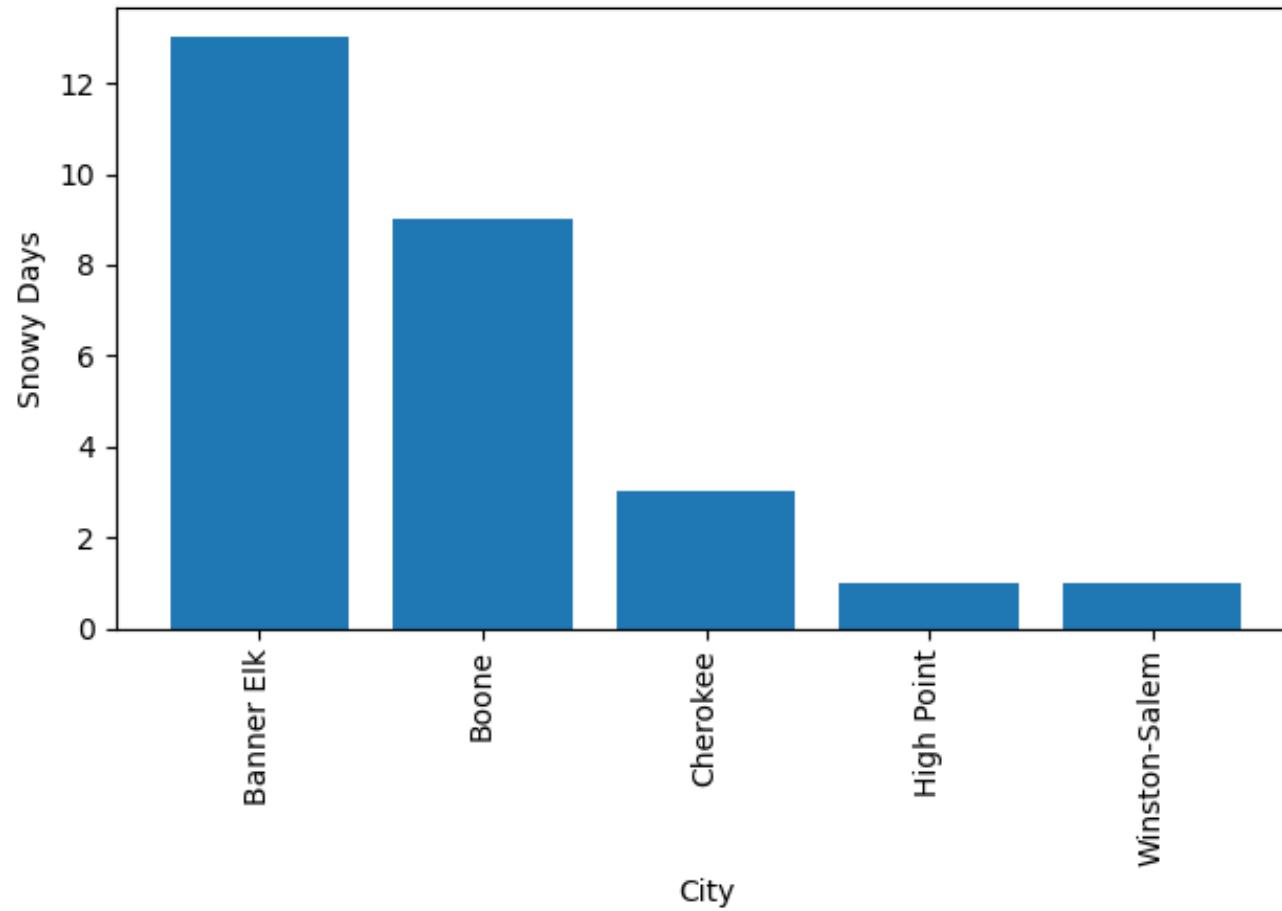
```
temp_grouped_df = filtered_df.groupby(['city', 'datetime'])['temp'].sum()  
print(temp_grouped_df)
```

# NUMBER OF RAINY DAYS (2023)



# NUMBER OF SNOWY DAYS (2023)

Number of Snowy Days in North Carolina Cities (2023)





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**THANK YOU!**

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Sources: [Quick Database Diagrams](#), [Visual Crossing Weather API](#), [Google Maps](#),  
Canva

Group Members: Austin McConnell, Everette Gough, Joanna Lewis, Joseph Anthony, Keisha Maldonado, Michele di Sanctis