Data Analysis Nanodegree Program - Project 1 (Exploring Weather Trends)

Import all our dependencies

In [19]:

```
import pandas as pd
import matplotlib.pyplot as plt
```

Load the CSV's

In [20]:

```
global_data_frame = pd.read_csv("global_data.csv").sort_values("year")
global_data_frame.head()
```

Out[20]:

	year	avg_temp
0	1750	8.72
1	1751	7.98
2	1752	5.78
3	1753	8.39
4	1754	8.47

In [21]:

```
cities_data_frame = pd.read_csv("cities.csv", usecols=["city", "country", "year"
, "avg_temp"])
cities_data_frame.head()
```

Out[21]:

	city	country	year	avg_temp
0	Abidjan	Côte D'Ivoire	1849	25.58
1	Abidjan	Côte D'Ivoire	1850	25.52
2	Abidjan	Côte D'Ivoire	1851	25.67
3	Abidjan	Côte D'Ivoire	1852	NaN
4	Abidjan	Côte D'Ivoire	1853	NaN

Discover the cities from my country

In this case it's the **Curitiba** city.

In [22]:

```
print(cities_data_frame[cities_data_frame["country"].str.contains("Brazil")].cit
y.unique())

curitiba_data_frame = cities_data_frame[cities_data_frame["city"].str.contains(
"Curitiba")].sort_values("year")
curitiba_data_frame.head()
```

```
['Belo Horizonte' 'Campinas' 'Colombo' 'Curitiba' 'Fortaleza' 'Guaru
lhos'
 'Manaus' 'Porto Alegre' 'Recife' 'Rio De Janeiro' 'Salvador']
```

Out[22]:

	city	country	year	avg_temp
19051	Curitiba	Brazil	1832	16.60
19052	Curitiba	Brazil	1833	17.48
19053	Curitiba	Brazil	1834	16.95
19054	Curitiba	Brazil	1835	16.28
19055	Curitiba	Brazil	1836	16.56

Clean city data

Here we have 7 records with null data, we could drop them, or just fill them with the median of the city historic temperatures

In [23]:

```
curitiba_data_frame["avg_temp"].isnull().sum()
```

Out[23]:

```
7
```

In [24]:

```
median = curitiba_data_frame["avg_temp"].median()
curitiba_data_frame["avg_temp"].fillna(median, inplace=True)
```

In [25]:

```
curitiba_data_frame["avg_temp"].isnull().sum()
```

Out[25]:

```
0
```

"Moving Average" for the global data and local data

I'm using a 7 day mobing average from the recommendation.

In [26]:

```
global_moving_average = global_data_frame["avg_temp"].rolling(7).mean()

print(global_moving_average.head(7))
print("\njust checking\n")
print(global_data_frame["avg_temp"].head(7))
print(global_data_frame["avg_temp"].head(7).sum() / 7)
```

```
0         NaN
1         NaN
2         NaN
3         NaN
4         NaN
5         NaN
6    8.078571
Name: avg_temp, dtype: float64

just checking

0    8.72
1    7.98
2    5.78
3    8.39
4    8.47
5    8.36
6    8.85
Name: avg_temp, dtype: float64
8.07857142857143
```

In [27]:

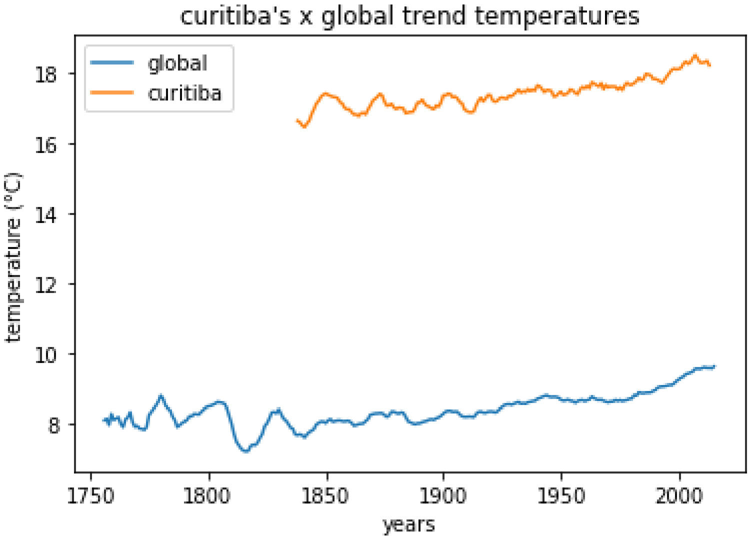
```
curitiba_moving_average = curitiba_data_frame["avg_temp"].rolling(7).mean()

print(curitiba_moving_average.head(7))
print("\njust checking\n")
print(curitiba_data_frame["avg_temp"].head(7))
print(curitiba_data_frame["avg_temp"].head(7).sum() / 7)
```

```
19051          NaN
19052          NaN
19053          NaN
19054          NaN
19055          NaN
19056          NaN
19057    16.624286
Name: avg_temp, dtype: float64

just checking

19051    16.60
19052    17.48
19053    16.95
19054    16.28
19055    16.56
19056    16.08
19057    16.42
Name: avg_temp, dtype: float64
16.624285714285715
```

Comparing my city temperature

In [28]:

```
plt.plot(global_data_frame["year"], global_moving_average, label="global")
plt.plot(curitiba_data_frame["year"], curitiba_moving_average, label="curitiba")

plt.xlabel("years")
plt.ylabel("temperature (°C)")

plt.title("curitiba's x global trend temperatures")

plt.legend()

plt.show()
```



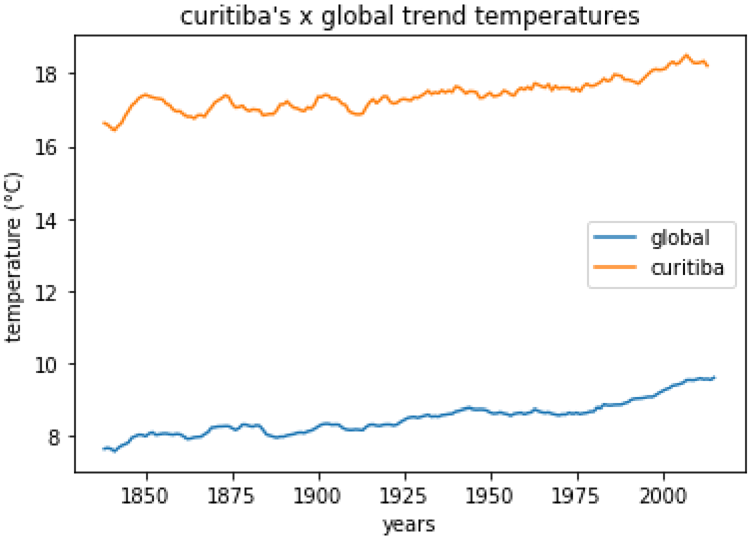
Curitiba doesn't have sufficient historic data

In [29]:

```
first_curitiba_year = curitiba_data_frame.iloc[0].year
short_global_data_frame = global_data_frame[global_data_frame.year >= first_curi
tiba_year]
short_global_moving_average = short_global_data_frame["avg_temp"].rolling(7).mea
n()
```

In [30]:

```
plt.plot(short_global_data_frame["year"], short_global_moving_average, label="global")
plt.plot(curitiba_data_frame["year"], curitiba_moving_average, label="curitiba")

plt.xlabel("years")
plt.ylabel("temperature (°C)")

plt.title("curitiba's x global trend temperatures")

plt.legend()

plt.figure(figsize=(18, 16), dpi= 80, facecolor='w', edgecolor='k')

plt.show()
```



```
<Figure size 1440x1280 with 0 Axes>
```