Exploring Weather Trends

The goal will be to create a visualization and prepare a write up describing the similarities and differences between global temperature trends and temperature trends in the closest big city to where you live.

Let's do the imports and display the head of each file.

Data Preparation

Imports

In [223]:

```python
import pandas as pd
import numpy as np
import matplotlib.pyplot as plt
import pylab
import seaborn as sns
```

Prepare files to be used on notebook

In [80]:

```python
city_temp = pd.read_csv('city_data.csv')
city_temp.head()
```

Out[80]:

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

In [81]:

```python
cities = pd.read_csv('city_list.csv')
cities.head()
```

Out[81]:

	city	country
0	Abidjan	Côte D'Ivoire
1	Abu Dhabi	United Arab Emirates
2	Abuja	Nigeria
3	Accra	Ghana
4	Adana	Turkey

In [82]:

```python
global_temp = pd.read_csv('global_data.csv')
global_temp.head()
```
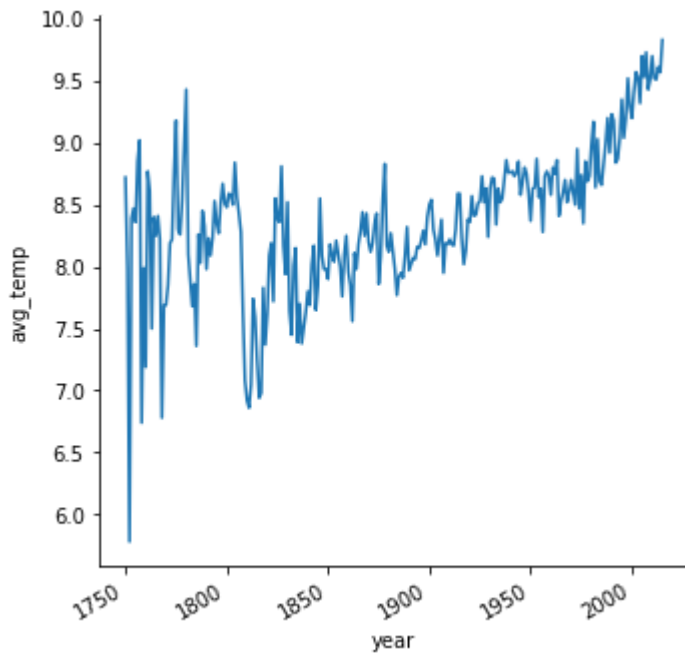
Out[82]:

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

Temperature plots

Global temperature change in time

In [90]:

```python
glob = sns.relplot(x="year", y="avg_temp", kind="line", data=global_temp)
glob.fig.autofmt_xdate()
```
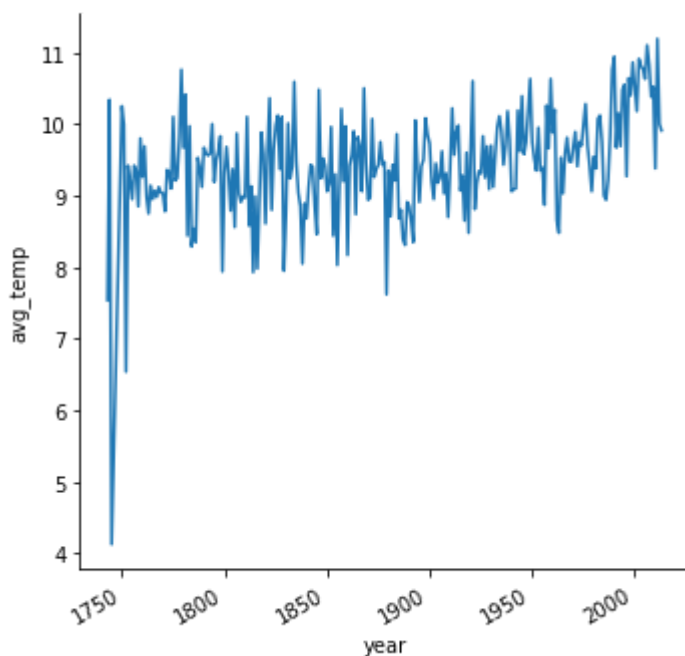

London temperature change in time

In [84]:

```python
my_city = city_temp.loc[(city_temp['city'] == 'London') & (city_temp['country'] ==
```

In [102]:

```python
g = sns.relplot(x="year", y="avg_temp", kind="line", data=my_city)
g.fig.autofmt_xdate()
```

In [86]:

```python
my_city.head()
```

Out[86]:

	year	city	country	avg_temp
36012	1743	London	United Kingdom	7.54
36013	1744	London	United Kingdom	10.34
36014	1745	London	United Kingdom	4.13
36015	1746	London	United Kingdom	NaN
36016	1747	London	United Kingdom	NaN

In [87]:

```python
global_temp.head()
```

Out[87]:

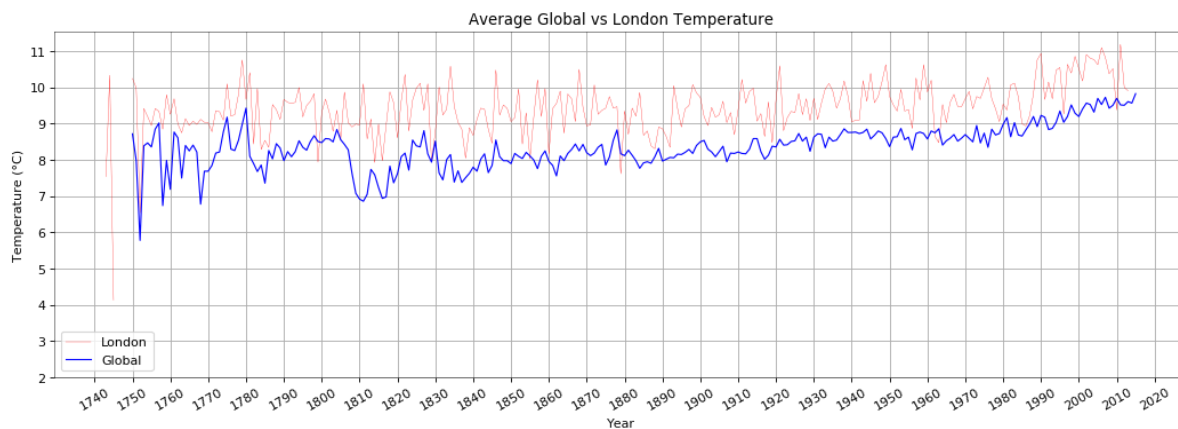|	year	avg_temp
0	1750	8.72
1	1751	7.98
2	1752	5.78
3	1753	8.39
4	1754	8.47

In [232]:

```python
#Draw plot
plt.figure(figsize=(16,5), dpi= 80)
a = plt.plot( 'year', 'avg_temp', data=my_city, marker='', color='red', linewidth=0.
b = plt.plot( 'year', 'avg_temp', data=global_temp, marker='', color='blue', linewic

#Improve plotting area
plt.title('Average Global vs London Temperature')
plt.ylabel('Temperature (ºC)')
plt.xlabel('Year')

plt.yticks(np.arange(2, 12, step=1))
plt.xticks(np.arange(1740, 2025, step=10), rotation=30)
pylab.legend()
plt.grid(True)



#Improve borders
plt.gca().spines["top"].set_alpha(0.5)
plt.gca().spines["bottom"].set_alpha(0.5)
plt.gca().spines["right"].set_alpha(0.5)
plt.gca().spines["left"].set_alpha(0.5)
plt.show()
```


Moving averages

In [241]:

```python
global_temp['moving_average'] = global_temp['avg_temp'].rolling(window=5).mean()
global_temp.head()
```

Out[241]:

	year	avg_temp	moving_average
0	1750	8.72	NaN
1	1751	7.98	NaN
2	1752	5.78	NaN
3	1753	8.39	NaN
4	1754	8.47	7.868

In [242]:

```python
city_temp['moving_average'] = city_temp['avg_temp'].rolling(window=5).mean()
my_city = city_temp.loc[(city_temp['city'] == 'London') & (city_temp['country'] ==
my_city.head()
```

Out[242]:

|	year	city	country	avg_temp	moving_average
36012	1743	London	United Kingdom	7.54	9.390
36013	1744	London	United Kingdom	10.34	9.564
36014	1745	London	United Kingdom	4.13	8.526
36015	1746	London	United Kingdom	NaN	NaN
36016	1747	London	United Kingdom	NaN	NaN

In [248]:

```python
#Draw plot
plt.figure(figsize=(16,5), dpi= 80)
a = plt.plot( 'year', 'moving_average', data=my_city, marker='', color='red', linew:
b = plt.plot( 'year', 'moving_average', data=global_temp, marker='', color='blue', 1

#Improve plotting area
plt.title('Moving Average Global vs London Temperature')
plt.ylabel('Temperature (ºC)')
plt.xlabel('Year')

plt.yticks(np.arange(6, 12, step=1))
plt.xticks(np.arange(1740, 2025, step=10), rotation=30)
pylab.legend()
plt.grid(True)


#Improve borders
plt.gca().spines["top"].set_alpha(0.5)
plt.gca().spines["bottom"].set_alpha(0.5)
plt.gca().spines["right"].set_alpha(0.5)
plt.gca().spines["left"].set_alpha(0.5)
plt.show()
```
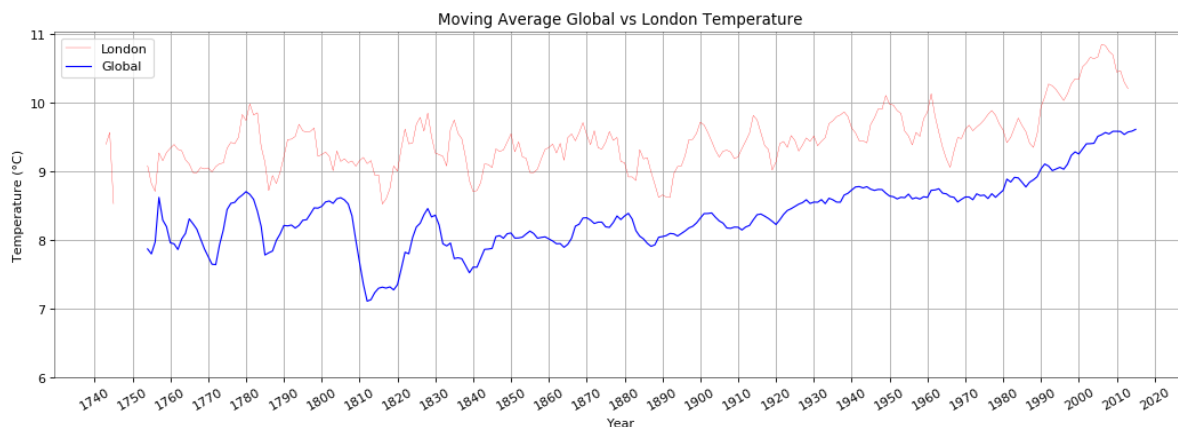

Observations

- Up until 1920 both Global and London temperatures have been relatively stable.
- Around 1810-1820 there is a deep in the global temperature, after some research it was found that this concides with the 'Year Without Summer' (https://en.wikipedia.org/wiki/Year_Without_a_Summer).
- Global temperature has risen in average from ~8°C to a sharp ~9.5°C in the last 20 years.
- Temperatures in Londo has risen in average from ~9°C to 10.5°C in the last 20 years.
- It seems that London follows similar rise as the global recorded temperature.

In [ ]: