

# Udacity - Exploring Weather Trends

In this project, i analyse local Oslo temperature and global temperature data and compare the local historic temperature trends to historic global temperature trends.

In [70]:

```
# import the necessary libraries for the project:
```

In [71]:

```
import pandas as pd
# pandas to visaulise the data like a spreadsheet.
import matplotlib.pyplot as plt
#matplotlib to visualise the dat in graph format.
```

## SQL queries

# SQL query to extract city level data Select \* From city\_data Where city = 'Oslo'; #SQL query to extract global level data Select \* From global\_data;

In [72]:

```
# Open the CSV file.
city_temp = pd.read_csv('city_results.csv')
global_temp = pd.read_csv('global_results.csv')
```

In [73]:

```
#view city file
city_temp.head(5)
```

Out[73]:

	year	city	country	avg_temp
0	1743	Oslo	Norway	-1.07
1	1744	Oslo	Norway	3.90
2	1745	Oslo	Norway	-5.97
3	1746	Oslo	Norway	NaN
4	1747	Oslo	Norway	NaN

In [74]:

```
#view global file
global_temp.head(5)
```

Out[74]:

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

After seeing both dataframes i decided to merge them on matching years. So the data could be pulled from one table. And illustrated as a line chart to visaulise progress over time.  
#New SQL query select global\_data.year, global\_data.avg\_temp as global\_avg, city\_data.avg\_temp as oslo\_avg from city\_data join global\_data on global\_data.year = city\_data.year where city = 'Oslo'

In [75]:

```
# data from the new SQL combined query.
combined = pd.read_csv('combined.csv')
combined.head(5)
```

Out[75]:

	year	global_avg	oslo_avg
0	1750	8.72	3.57
1	1751	7.98	3.06
2	1752	5.78	-2.24
3	1753	8.39	2.15
4	1754	8.47	2.18

I now have all the data in one table.

## Calculate Moving average

I wanted to calculate the moving average over 30 days.

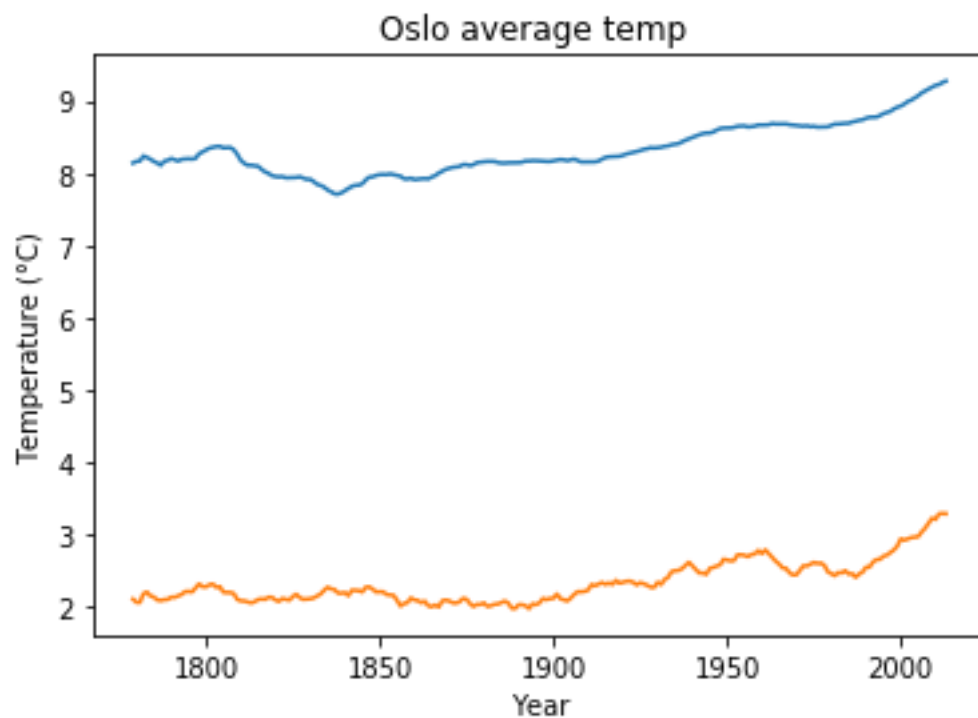
In [92]:

```
Global_mva = combined['global_avg'].rolling(30).mean()
City_mva = combined['oslo_avg'].rolling(30).mean()
```

<https://medium.com/python-pandemonium/data-visualization-in-python-line-graph-in-matplotlib-9dfd0016d180> (<https://medium.com/python-pandemonium/data-visualization-in-python-line-graph-in-matplotlib-9dfd0016d180>)

In [97]:

```
plt.plot(combined['year'],Global_mva, label= 'Global')
plt.plot(combined['year'],City_mva, label = 'Oslo')
plt.xlabel('Year')
plt.ylabel('Temperature (°C)')
plt.title('Oslo average temp ')
plt.show()
```



## Observations

Oslo has a much lower average temperature than the global average. The difference is consistent and greater than 4°C at all times. The overall trend is that the world and Oslo are warming up slowly, as can be seen from the 1800s until the 2000s. Oslo has had a steep climb in average temperature from 1950.

In [ ]:

In [ ]:

In [ ]:

In [ ]: