

# Data Analytics Nano-Degree - Project #1:

## Exploring Weather Trends

### Outline of Steps

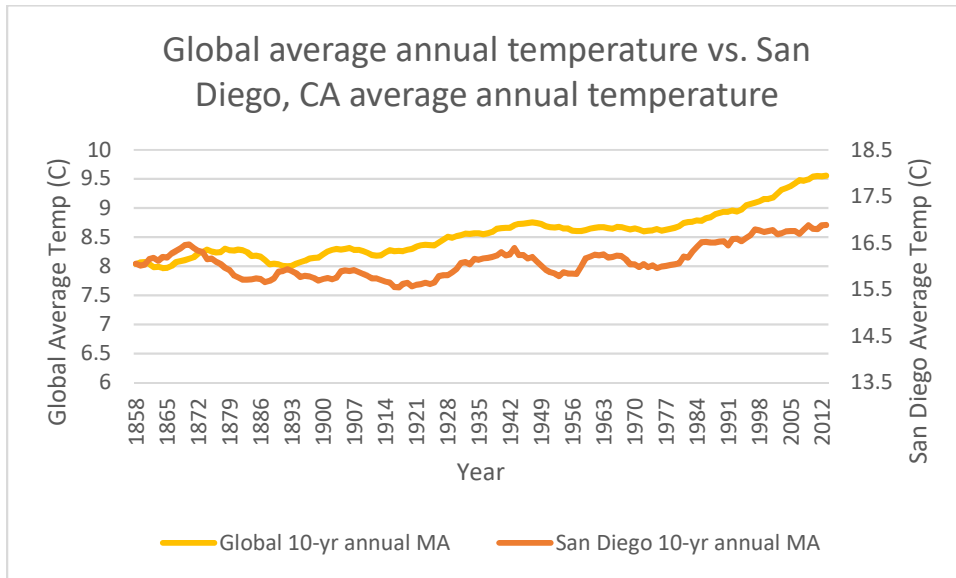
- 1) Data was extracted using the workspace provided and using the following SQL command:

```
SELECT city_data.year, global_data.avg_temp AS global_temp, city_data.avg_temp AS city_temp FROM  
global_data, city_data WHERE city_data.year=global_data.year AND city_data.city='San Diego' AND  
city_data.country='United States'
```

- 2) Resulting data was downloaded to my local machine in the form of a .csv file and the analysis was performed using Excel.
- 3) The average annual temperature data was smoothed to better display the trend using a 10 year moving average using the built-in AVERAGE( ) function applied to 10 values of annual average temperature data and then copied to successive cells in the column (see the following screenshot).

	A	B	C	D	E
	year	global_temp	city_temp	Global 10-yr annual MA	San Diego 10-yr annual MA
1					
2	1849	7.98	16.03		
3	1850	7.9	15.55		
4	1851	8.18	15.66		
5	1852	8.1	16.06		
6	1853	8.04	16.69		
7	1854	8.21	16.11		
8	1855	8.11	16.31		
9	1856	8	15.75		
10	1857	7.76	16.41		
11	1858	8.1	15.96	=AVERAGE(B2:B11)	16.053
12	1859	8.25	15.64	8.065	16.014
13	1860	7.96	15.74	8.071	16.033
14	1861	7.85	16.82	8.038	16.149
15	1862	7.56	16.37	7.984	16.18
16	1863	8.11	16.1	7.991	16.121
17	1864	7.98	16.87	7.968	16.197
18	1865	8.18	16.18	7.975	16.184
19	1866	8.22	16.64	8.004	16.232

- 4) The following line chart was created in Excel. The global annual average temperature is plotted against the left vertical axis and the San Diego, California data was plotted against the right vertical axis in order to better compare the two data sets.



- 5) The following observations are noteworthy in this chart:
- The average annual temperature in San Diego, California is 7.57° C warmer than the global annual average temperature so the left and right axes were offset to bring the two curves closer together in the chart. This difference was calculated across the entire 160 year span of data available for the city of San Diego.
  - The average annual global temperature has trended higher at a faster rate than the average annual temperature in San Diego. Therefore the difference between the global average annual temperature and that in San Diego has, in general, been trending downward of this observation period.
  - Both the global and San Diego average annual temperatures have trended higher from 1972 through 2013 (the last year analyzed). While the trend has not been consistent across the entire 160 year analysis period the global curve is consistent with a warming planet Earth.
  - As one might expect when comparing a global average temperature with an average taken in just one location (San Diego in this case), the latter curve shows more variation even after applying moving average smoothing. In fact San Diego's average annual temperature trended slightly lower for the first 65 years of this data set.