

UDACITY DATA ANALYST NANO DEGREE
PROJECT 1 – EXPLORING WEATHER TRENDS

TOOLS

The following tools were used for retrieving data, preparing the data, data visualization and generating some statistical inferences.

- SQL
- Google Sheets

DATA EXTRACTION

The data for this analysis were retrieved with the following SQL queries and downloaded as CSV files for analysis.

- View all the cities that are in the given data to find the one closest to me.
SELECT * FROM city_list;
- Select the year and the average temperature columns for Accra.
SELECT year, avg_temp FROM city_data WHERE city= 'Accra';
- Select the global data.
SELECT * FROM global_data;

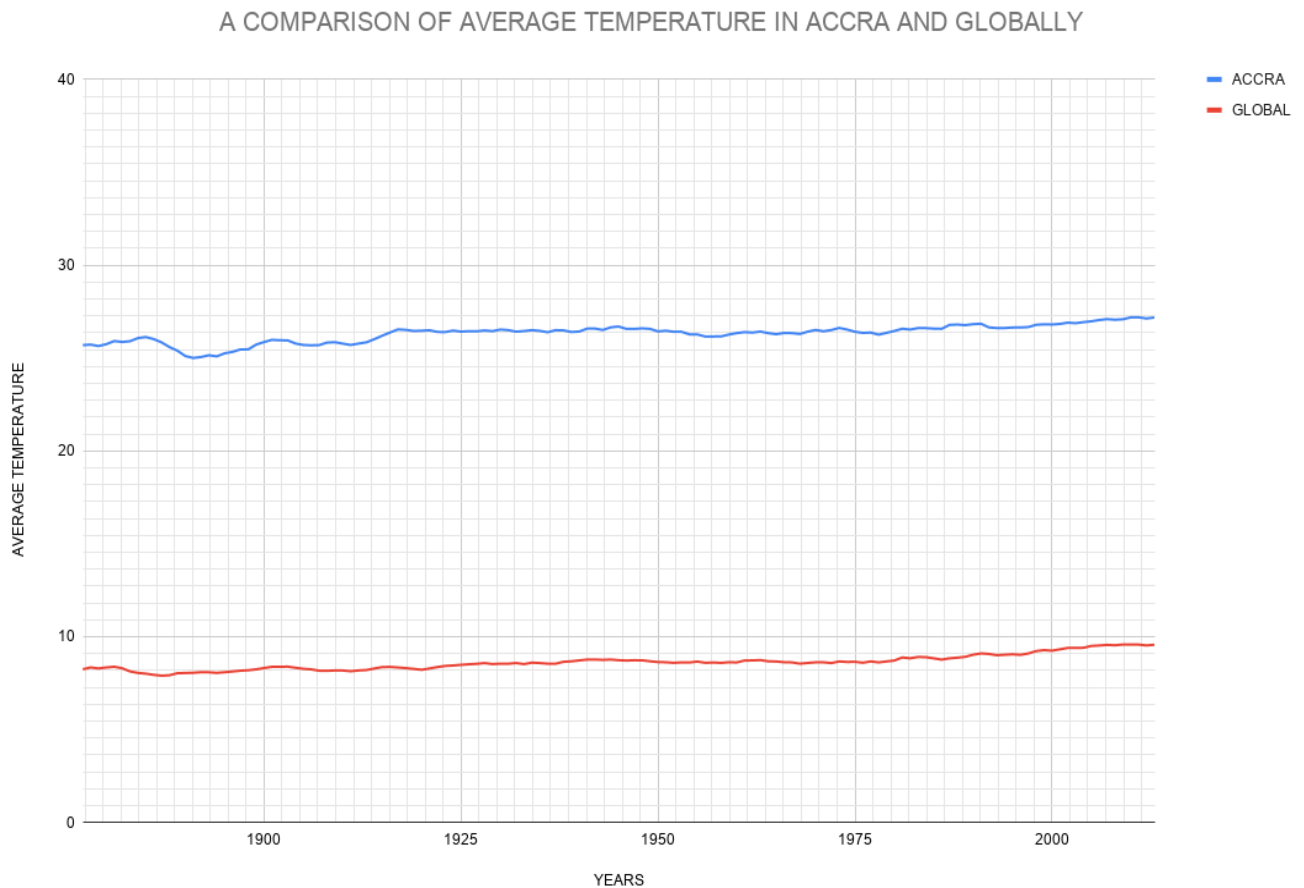
MOVING AVERAGES

I computed a 5-year moving average for both global and Accra using Google Sheets. There were 14 missing average temperature values for Accra so I started computing the moving averages from 1873 to 2013 for both of them.

The global data capture years than Accra that is why it was limited to the range indicated above.

The result of the computation is in a table at the end of the report.

DATA VISUALIZATION



DATA INTERPRETATION / OBSERVATIONS

- Accra is hotter compared to the global data and understandably so as it is located in West Africa. This difference is consistent over the given time range.
- It is evident from the graph that there has been a temperature increase in Accra and globally, albeit a steady increase. The computed correlation coefficient between global and Accra temperatures is 0.855032677. This is a positive correlation coefficient which demonstrates that the temperature increase is not only in Accra, being in West Africa but same is observed globally.
- The temperatures in both categories have not spread that match. The global standard deviation is 0.406 while the standard deviation of Accra is 0.476
- In general, we observe that the world is getting hotter.

DATASET

YEARS	ACCRA_MA	GLOBAL_MA
1877	25.698	8.252
1878	25.724	8.348
1879	25.648	8.296
1880	25.75	8.348
1881	25.918	8.386
1882	25.868	8.304
1883	25.908	8.134
1884	26.076	8.054
1885	26.132	8.014
1886	26.022	7.95
1887	25.844	7.906
1888	25.592	7.928
1889	25.4	8.038
1890	25.112	8.048
1891	25.006	8.062
1892	25.056	8.094
1893	25.152	8.088
1894	25.092	8.056
1895	25.256	8.092
1896	25.332	8.13
1897	25.466	8.174
1898	25.468	8.198
1899	25.726	8.246
1900	25.862	8.316
1901	25.982	8.382
1902	25.96	8.384
1903	25.954	8.392
1904	25.782	8.33
1905	25.706	8.276
1906	25.688	8.244
1907	25.7	8.174
1908	25.834	8.168
1909	25.854	8.186
1910	25.778	8.184
1911	25.706	8.144
1912	25.78	8.188
1913	25.848	8.21

1914	26.018	8.292
1915	26.204	8.366
1916	26.378	8.376
1917	26.544	8.346
1918	26.518	8.312
1919	26.46	8.27
1920	26.472	8.224
1921	26.498	8.292
1922	26.408	8.37
1923	26.4	8.428
1924	26.48	8.454
1925	26.424	8.488
1926	26.448	8.52
1927	26.442	8.542
1928	26.486	8.584
1929	26.45	8.53
1930	26.536	8.55
1931	26.504	8.548
1932	26.422	8.586
1933	26.456	8.528
1934	26.504	8.606
1935	26.464	8.584
1936	26.39	8.55
1937	26.502	8.548
1938	26.492	8.652
1939	26.404	8.678
1940	26.428	8.726
1941	26.586	8.77
1942	26.59	8.776
1943	26.514	8.756
1944	26.654	8.774
1945	26.698	8.738
1946	26.572	8.72
1947	26.57	8.734
1948	26.6	8.732
1949	26.572	8.68
1950	26.436	8.638
1951	26.474	8.628
1952	26.414	8.596

1953	26.414	8.62
1954	26.276	8.614
1955	26.27	8.666
1956	26.16	8.596
1957	26.164	8.614
1958	26.166	8.594
1959	26.266	8.628
1960	26.346	8.618
1961	26.398	8.722
1962	26.374	8.726
1963	26.426	8.744
1964	26.344	8.68
1965	26.284	8.67
1966	26.352	8.63
1967	26.344	8.62
1968	26.298	8.552
1969	26.422	8.59
1970	26.514	8.624
1971	26.444	8.624
1972	26.51	8.584
1973	26.622	8.67
1974	26.536	8.644
1975	26.416	8.652
1976	26.356	8.602
1977	26.374	8.672
1978	26.26	8.62
1979	26.358	8.672
1980	26.46	8.72
1981	26.58	8.884
1982	26.536	8.842
1983	26.614	8.91
1984	26.612	8.902
1985	26.586	8.838
1986	26.576	8.77
1987	26.786	8.84
1988	26.804	8.874
1989	26.772	8.92
1990	26.826	9.034
1991	26.846	9.104

1992	26.652	9.074
1993	26.616	9.008
1994	26.618	9.032
1995	26.646	9.056
1996	26.648	9.028
1997	26.67	9.1
1998	26.792	9.23
1999	26.816	9.28
2000	26.808	9.25
2001	26.838	9.324
2002	26.906	9.398
2003	26.878	9.4
2004	26.934	9.406
2005	26.98	9.506
2006	27.048	9.53
2007	27.096	9.562
2008	27.064	9.542
2009	27.088	9.58
2010	27.19	9.58
2011	27.192	9.578
2012	27.132	9.534
2013	27.184	9.57