

TREND EXPLORING WEATHER PROJECT

INTRODUCTION:

This is my first Project in Data Analyst Term 1 in Udacity Nano Degree Program.

In this Project, we have to analyze local temperature data where we live and global temperature data. And then we have to compare overall global temperature trends to local temperature where we live.

The main objectives of this project was to create visualization and show similarities and differences between the local temperature trends and global temperature trends. The workspace and a database were provided from where we can extract the data using SQL code. The result was exported in CSV which I converted into Excel. I used excel for moving averages and to create a line chart.

DATA EXTRACTION

- Write a SQL query to extract the city level data. Export to CSV.
- Write a SQL query to extract the global data. Export to CSV.

The language I used for data extraction was SQL which was provided from workspace that is connected to a database. First I search details of city in United States to know whether the city I live in was in the list or not. The city I live is Oklahoma city which was listed in database. Second, I extract data for Oklahoma city and global data. Then the extracted data was downloaded as CSV which I later converted into excel.

SOLUTION:

Query to view the details of city in United states.

```
SELECT *  
FROM city_data  
WHERE country = 'United States';
```

Query to extract the city level data

```
SELECT *  
FROM city_data  
WHERE country = 'United States' AND city = 'Oklahoma City';
```

Query to extract the global data.

```
SELECT *  
FROM global_data;
```

MOVING AVERAGES

To observe the trends in temperature, I calculated the moving averages for both Oklahoma city and global world for 10 years period.

year	globe_temp	okc avg temp	10yrs MA Global temp	10 yrs MA OKC
1768	6.78	12	6.78	12
1769	7.69	17.02	7.235	14.51
1770	7.69		7.386666667	14.51
1771	7.85		7.5025	14.51
1772	8.19		7.64	14.51
1773	8.22		7.736666667	14.51
1774	8.77		7.884285714	14.51
1775	9.18	17.3	8.04625	15.44
1776	8.3	17.44	8.074444444	15.94
1777	8.26	19.8	8.093	16.712
1778	8.54		8.269	17.89
1779	8.98		8.398	18.18
1780	9.43		8.572	18.18
1781	8.1	12.72	8.597	16.815
1782	7.9	14.08	8.568	16.268
1783	7.68		8.514	16.268
1784	7.86		8.423	16.268
1785	7.36		8.241	16.01
1786	8.26		8.237	15.53333333
1787	8.03		8.214	13.4
1788	8.45		8.205	13.4
1789	8.33		8.14	13.4
1790	7.98		7.995	13.4
1791	8.23		8.008	14.08
1796	8.27	18.8	8.215	18.8
1797	8.51	12.82	8.295	15.81
1798	8.67		8.331666667	15.81
1799	8.51		8.361666667	15.81
1800	8.48		8.445	15.81
1801	8.59		8.505	15.81
1802	8.58		8.515714286	15.81
1803	8.5		8.51375	15.81
1804	8.84		8.55	15.81
1805	8.56		8.551	15.81
1806	8.43		8.567	12.82

1814	7.59	10.16	8.193333333	10.16
1815	7.24	16.25	7.753333333	13.205
1816	6.94		7.256666667	13.205
1817	6.98		7.1875	13.205
1818	7.83		7.316	13.205
1819	7.37		7.325	13.205
1820	7.62	13.93	7.367142857	13.44666667
1821	8.09	14.41	7.4575	13.6875
1822	8.19	14.96	7.538888889	13.942
1823	7.72	14.57	7.557	14.04666667
1824	8.55	14.89	7.653	14.835
1825	8.39	15.63	7.768	14.73166667
1826	8.36	14.99	7.91	14.76857143
1827	8.81	15.72	8.093	14.8875
1828	8.17	15.39	8.127	14.94333333
1829	7.94	15.06	8.184	14.955
1830	8.52	15.93	8.274	15.155
1831	7.64	14.04	8.229	15.118
1832	7.45	15.02	8.155	15.124
1833	8.01	15.57	8.184	15.224
1834	8.15	15.73	8.144	15.308
1835	7.39	13.89	8.044	15.134
1836	7.7	13.63	7.978	14.998
1837	7.38	14.58	7.835	14.884
1838	7.51	13.71	7.769	14.716
1839	7.63	14.95	7.738	14.705
1840	7.8	14.64	7.666	14.576
1841	7.69	14.64	7.671	14.636
1842	8.02	15.12	7.728	14.646
1843	8.17	14.24	7.744	14.513
1844	7.65	14.92	7.694	14.432
1845	7.85	15.15	7.74	14.558
1846	8.55	15.53	7.825	14.748
1847	8.09	13.93	7.896	14.683
1848	7.98	14.41	7.943	14.753
1849	7.98	14.65	7.978	14.723
1850	7.9	14.71	7.988	14.73
1851	8.18	15.13	8.037	14.779
1852	8.1	14.37	8.045	14.704
1853	8.04	14.53	8.032	14.733
1854	8.21	15.7	8.088	14.811

1855	8.11	14.9	8.114	14.786
1856	8	13.99	8.059	14.632
1857	7.76	14.42	8.026	14.681
1858	8.1	15.02	8.038	14.742
1859	8.25	14.87	8.065	14.764
1860	7.96	15.71	8.071	14.864
1861	7.85	15.55	8.038	14.906
1862	7.56	15.33	7.984	15.002
1863	8.11	15.17	7.991	15.066
1864	7.98	14.6	7.968	14.956
1865	8.18	15.01	7.975	14.967
1866	8.29	14.77	8.004	15.045
1867	8.44	15.17	8.072	15.12
1868	8.25	14.72	8.087	15.09
1869	8.43	13.76	8.105	14.979
1870	8.2	15.09	8.129	14.917
1871	8.12	15.33	8.156	14.895
1872	8.19	14.13	8.219	14.775
1873	8.35	14.13	8.243	14.671
1874	8.43	15.08	8.288	14.719
1875	7.86	13.83	8.256	14.601
1876	8.08	14.68	8.235	14.592
1877	8.54	14.84	8.245	14.559
1878	8.83	15.39	8.303	14.626
1879	8.17	15.37	8.277	14.787
1880	8.12	14.95	8.269	14.773
1881	8.27	15.22	8.284	14.762
1882	8.13	15.31	8.278	14.88
1883	7.98	14.17	8.241	14.884
1884	7.77	14.01	8.175	14.777
1885	7.92	13.7	8.181	14.764
1886	7.95	14.3	8.168	14.726
1887	7.91	14.84	8.105	14.726
1888	8.09	14.46	8.031	14.633
1889	8.32	14.85	8.046	14.581
1890	7.97	15.37	8.031	14.623
1891	8.02	14.43	8.006	14.544
1892	8.07	14.1	8	14.423
1893	8.06	14.84	8.008	14.49
1894	8.16	15.18	8.047	14.607
1895	8.15	14.18	8.07	14.655

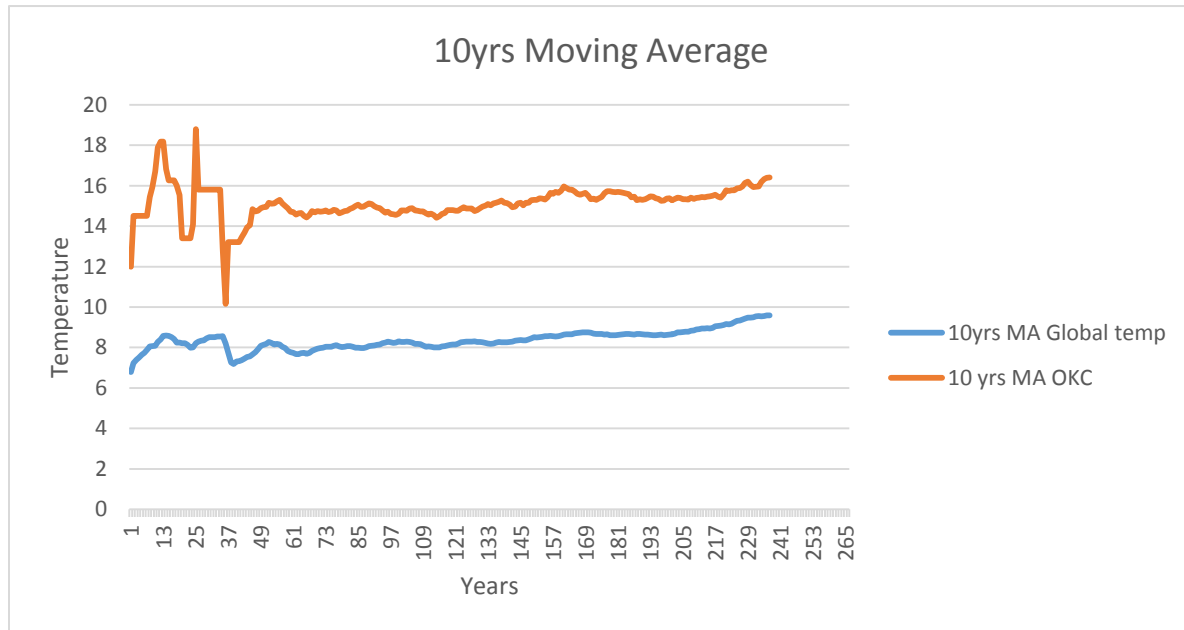
1896	8.21	15.66	8.096	14.791
1897	8.29	14.81	8.134	14.788
1898	8.18	14.46	8.143	14.788
1899	8.4	14.56	8.151	14.759
1900	8.5	15.37	8.204	14.759
1901	8.54	15.39	8.256	14.855
1902	8.3	14.96	8.279	14.941
1903	8.22	14.12	8.295	14.869
1904	8.09	15.22	8.288	14.873
1905	8.23	14.16	8.296	14.871
1906	8.38	14.45	8.313	14.75
1907	7.95	15.33	8.279	14.802
1908	8.19	15.37	8.28	14.893
1909	8.18	15.37	8.258	14.974
1910	8.22	15.86	8.23	15.023
1911	8.18	16.14	8.194	15.098
1912	8.17	14.26	8.181	15.028
1913	8.3	15.11	8.189	15.127
1914	8.59	15.59	8.239	15.164
1915	8.59	14.55	8.275	15.203
1916	8.23	15.08	8.26	15.266
1917	8.02	14.28	8.267	15.161
1918	8.13	15.22	8.261	15.146
1919	8.38	14.57	8.281	15.066
1920	8.36	14.62	8.295	14.942
1921	8.57	16.48	8.334	14.976
1922	8.41	15.7	8.358	15.12
1923	8.42	15.48	8.37	15.157
1924	8.51	14.4	8.362	15.038
1925	8.53	15.77	8.356	15.16
1926	8.73	15.05	8.406	15.157
1927	8.52	15.51	8.456	15.28
1928	8.63	15.48	8.506	15.306
1929	8.24	14.52	8.492	15.301
1930	8.63	15.48	8.519	15.387
1931	8.72	16.29	8.534	15.368
1932	8.71	15.18	8.564	15.316
1933	8.34	16.61	8.556	15.429
1934	8.63	16.6	8.568	15.649
1935	8.52	15.36	8.567	15.608
1936	8.55	16.01	8.549	15.704

1937	8.7	14.95	8.567	15.648
1938	8.86	16.49	8.59	15.749
1939	8.76	16.64	8.642	15.961
1940	8.76	14.66	8.655	15.879
1941	8.77	15.6	8.66	15.81
1942	8.73	15.17	8.662	15.809
1943	8.76	15.59	8.704	15.707
1944	8.85	15.5	8.726	15.597
1945	8.58	14.89	8.732	15.55
1946	8.68	16.53	8.745	15.602
1947	8.8	15.41	8.755	15.648
1948	8.75	15.03	8.744	15.502
1949	8.59	14.97	8.727	15.335
1950	8.37	14.89	8.688	15.358
1951	8.63	15.03	8.674	15.301
1952	8.64	15.9	8.665	15.374
1953	8.87	16.35	8.676	15.45
1954	8.56	17.32	8.647	15.632
1955	8.63	15.8	8.652	15.723
1956	8.28	16.62	8.612	15.732
1957	8.73	14.99	8.605	15.69
1958	8.77	15	8.607	15.687
1959	8.73	15.07	8.621	15.697
1960	8.58	14.75	8.642	15.683
1961	8.8	14.67	8.659	15.647
1962	8.75	15.58	8.67	15.615
1963	8.86	16.06	8.669	15.586
1964	8.41	15.78	8.654	15.432
1965	8.53	16.02	8.644	15.454
1966	8.6	15	8.676	15.292
1967	8.7	15.38	8.673	15.331
1968	8.52	14.78	8.648	15.309
1969	8.6	15.24	8.635	15.326
1970	8.7	15.46	8.647	15.397
1971	8.6	15.5	8.627	15.48
1972	8.5	15.33	8.602	15.455
1973	8.95	15.29	8.611	15.378
1974	8.47	15.52	8.617	15.352
1975	8.74	15.03	8.638	15.253
1976	8.35	15.24	8.613	15.277
1977	8.85	16.3	8.628	15.369

1978	8.69	14.91	8.645	15.382
1979	8.73	14.28	8.658	15.286
1980	8.98	16.08	8.686	15.348
1981	9.17	16.2	8.743	15.418
1982	8.64	15.13	8.757	15.398
1983	9.03	14.62	8.765	15.331
1984	8.69	15.48	8.787	15.327
1985	8.66	14.87	8.779	15.311
1986	8.83	16.24	8.827	15.411
1987	8.99	15.63	8.841	15.344
1988	9.2	15.38	8.892	15.391
1989	8.92	14.56	8.911	15.419
1990	9.23	16.26	8.936	15.437
1991	9.18	16.13	8.937	15.43
1992	8.84	15.49	8.957	15.466
1993	8.87	14.73	8.941	15.477
1994	9.04	15.72	8.976	15.501
1995	9.35	15.42	9.045	15.556
1996	9.04	15.24	9.066	15.456
1997	9.2	15.23	9.087	15.416
1998	9.52	17	9.119	15.578
1999	9.29	16.5	9.156	15.772
2000	9.2	15.91	9.153	15.737
2001	9.41	16.46	9.176	15.77
2002	9.57	15.51	9.249	15.772
2003	9.53	15.7	9.315	15.869
2004	9.32	15.87	9.343	15.884
2005	9.7	16.2	9.378	15.962
2006	9.53	17.1	9.427	16.148
2007	9.73	15.83	9.48	16.208
2008	9.43	15.41	9.471	16.049
2009	9.51	15.4	9.493	15.939
2010	9.7	15.95	9.543	15.943
2011	9.52	16.71	9.554	15.968
2012	9.51	17.69	9.548	16.186
2013	9.61	17.21	9.556	16.337
2014	9.57		9.581	16.38888889
2015	9.83		9.594	16.4125

LINE CHARTS

To create a line chart, first the moving averages for both local temperature data and global temperature data for 10 years periods were calculated using excel. I made a chart for 10year periods.



DATA VISUALIZATION:

- The above graph visualizes temperatures and 10 year moving averages for local (Oklahoma city) and global data. The blue color indicates for global dataset and red for Oklahoma city.
- Here we can see from the chart that the highest temperature for Oklahoma city was 18.8 in the year 1796 and for global was 9.594 in the year 2015.
- If comparing global average temperature and Oklahoma city average temperature, it is clear that Oklahoma city is hotter than the global average temperature.
- The average Oklahoma city temperature has high fluctuation which slowly stabilizes into upward trend. From the year 1834, the trend seems to be similar for both Oklahoma city and global world.
- The lowest average temperature of Oklahoma city was in the year 1814 which was quite close to the average global temperature as compared to the other year.
- According to the graph, the global world is getting hotter as the temperature is increasing from the year 1866 to 2015.