Exploring Weather Trends

Name: Akshay Kajale

Course: Data Analytics Bootcamp

This project is focused on Analyzing the weather trends (temperature) of the overall globe and the major city near your current location.

Steps:

**Step 1: Accessing Data with SQL**

The major city near me is Seattle. As per the requirement of this project, I used the following SQL queries to get fetch the data from Database.

1. First, I checked whether Seattle is present in the city\_list table

**SELECT \*FROM city\_list WHERE city = ‘Seattle’ and country = ‘United States’;**

1. Secondly, I fetched the data from regarding weather from city\_data and global\_data. Since it is a Comparison project, I used only the common years between global and Seattle temperatue and eliminated the rest (1828-2013).

**SELECT g.year, g.avg\_temp AS Global\_temperature, l.year,l.avg\_temp AS Seattle\_temperature**

**FROM global\_data AS g JOIN city\_data AS l ON**

**g.year = l.year and l.city = 'Seattle';**

**Step 2: Cleaning Data (Filling Missing Values)**

I observed that for some years in **Seattle\_temperature** values were missing. I filled those values with the mean value of remaining values.

**Step 3: Calculating Moving average**

I chose range as 11 for calculating moving average.

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **year** | **global\_temperature** | **Seattle\_temperature** | **Global Moving Average** | **Seattle Moving Average** |
| 1828 | 8.17 | 7.13 |  |  |
| 1829 | 7.94 | 6.8 |  |  |
| 1830 | 8.52 | 7.50136612 |  |  |
| 1831 | 7.64 | 7.50136612 |  |  |
| 1832 | 7.45 | 3.52 |  |  |
| 1833 | 8.01 | 7.48 |  |  |
| 1834 | 8.15 | 7.1 |  |  |
| 1835 | 7.39 | 5.58 |  |  |
| 1836 | 7.7 | 6.74 |  |  |
| 1837 | 7.38 | 6.81 |  |  |
| 1838 | 7.51 | 6.59 | 7.805454545 | 6.613884749 |
| 1839 | 7.63 | 7.3 | 7.756363636 | 6.629339295 |
| 1840 | 7.8 | 6.69 | 7.743636364 | 6.619339295 |
| 1841 | 7.69 | 6.81 | 7.668181818 | 6.556487829 |
| 1842 | 8.02 | 6.88 | 7.702727273 | 6.5 |
| 1843 | 8.17 | 6.55 | 7.768181818 | 6.775454545 |
| 1844 | 7.65 | 6.41 | 7.735454545 | 6.678181818 |
| 1845 | 7.85 | 6.88 | 7.708181818 | 6.658181818 |
| 1846 | 8.55 | 7.50136612 | 7.813636364 | 6.832851465 |
| 1847 | 8.09 | 8.99 | 7.849090909 | 7.03739692 |
| 1848 | 7.98 | 6.6 | 7.903636364 | 7.018306011 |
| 1849 | 7.98 | 6.68 | 7.946363636 | 7.026487829 |
| 1850 | 7.9 | 7.06 | 7.970909091 | 7.004669647 |
| 1851 | 8.18 | 7.79 | 8.005454545 | 7.104669647 |
| 1852 | 8.1 | 7.08 | 8.042727273 | 7.129215102 |
| 1853 | 8.04 | 7.61 | 8.044545455 | 7.195578738 |
| 1854 | 8.21 | 6.99 | 8.048181818 | 7.235578738 |
| 1855 | 8.11 | 7.31 | 8.09 | 7.31739692 |
| 1856 | 8 | 7.44 | 8.103636364 | 7.368306011 |
| 1857 | 7.76 | 7.91 | 8.031818182 | 7.405454545 |
| 1858 | 8.1 | 6.91 | 8.032727273 | 7.216363636 |
| 1859 | 8.25 | 6.27 | 8.057272727 | 7.186363636 |
| 1860 | 7.96 | 7.63 | 8.055454545 | 7.272727273 |
| 1861 | 7.85 | 7.18 | 8.050909091 | 7.283636364 |
| 1862 | 7.56 | 6.36 | 7.994545455 | 7.153636364 |
| 1863 | 8.11 | 7.44 | 7.995454545 | 7.186363636 |
| 1864 | 7.98 | 7.64 | 7.99 | 7.189090909 |
| 1865 | 8.18 | 7.05 | 7.987272727 | 7.194545455 |
| 1866 | 8.29 | 7.39 | 8.003636364 | 7.201818182 |
| 1867 | 8.44 | 7.12 | 8.043636364 | 7.172727273 |
| 1868 | 8.25 | 6.99 | 8.088181818 | 7.089090909 |
| 1869 | 8.43 | 8.33 | 8.118181818 | 7.218181818 |
| 1870 | 8.2 | 7.85 | 8.113636364 | 7.361818182 |
| 1871 | 8.12 | 7.97 | 8.128181818 | 7.392727273 |
| 1872 | 8.19 | 7.34 | 8.159090909 | 7.407272727 |
| 1873 | 8.35 | 7.47 | 8.230909091 | 7.508181818 |
| 1874 | 8.43 | 7.32 | 8.26 | 7.497272727 |
| 1875 | 7.86 | 6.9 | 8.249090909 | 7.43 |
| 1876 | 8.08 | 7.12 | 8.24 | 7.436363636 |
| 1877 | 8.54 | 8.14 | 8.262727273 | 7.504545455 |
| 1878 | 8.83 | 7.89 | 8.298181818 | 7.574545455 |
| 1879 | 8.17 | 6.74 | 8.290909091 | 7.551818182 |
| 1880 | 8.12 | 5.95 | 8.262727273 | 7.335454545 |
| 1881 | 8.27 | 6.86 | 8.269090909 | 7.245454545 |
| 1882 | 8.13 | 6.88 | 8.27 | 7.146363636 |
| 1883 | 7.98 | 6.97 | 8.250909091 | 7.112727273 |
| 1884 | 7.77 | 6.81 | 8.198181818 | 7.052727273 |
| 1885 | 7.92 | 8.66 | 8.151818182 | 7.174545455 |
| 1886 | 7.95 | 7.85 | 8.16 | 7.260909091 |
| 1887 | 7.91 | 6.77 | 8.144545455 | 7.229090909 |
| 1888 | 8.09 | 7.73 | 8.103636364 | 7.191818182 |
| 1889 | 8.32 | 8.08 | 8.057272727 | 7.209090909 |
| 1890 | 7.97 | 7.03 | 8.039090909 | 7.235454545 |
| 1891 | 8.02 | 7.61 | 8.03 | 7.386363636 |
| 1892 | 8.07 | 7.54 | 8.011818182 | 7.448181818 |
| 1893 | 8.06 | 6.16 | 8.005454545 | 7.382727273 |
| 1894 | 8.16 | 6.88 | 8.021818182 | 7.374545455 |
| 1895 | 8.15 | 7.26 | 8.056363636 | 7.415454545 |
| 1896 | 8.21 | 7.2 | 8.082727273 | 7.282727273 |
| 1897 | 8.29 | 7.5 | 8.113636364 | 7.250909091 |
| 1898 | 8.18 | 7.6 | 8.138181818 | 7.326363636 |
| 1899 | 8.4 | 7.08 | 8.166363636 | 7.267272727 |
| 1900 | 8.5 | 7.95 | 8.182727273 | 7.255454545 |
| 1901 | 8.54 | 7.27 | 8.234545455 | 7.277272727 |
| 1902 | 8.3 | 7.33 | 8.26 | 7.251818182 |
| 1903 | 8.22 | 6.98 | 8.273636364 | 7.200909091 |
| 1904 | 8.09 | 7.7 | 8.276363636 | 7.340909091 |
| 1905 | 8.23 | 7.59 | 8.282727273 | 7.405454545 |
| 1906 | 8.38 | 7.99 | 8.303636364 | 7.471818182 |
| 1907 | 7.95 | 7.28 | 8.28 | 7.479090909 |
| 1908 | 8.19 | 7.32 | 8.270909091 | 7.462727273 |
| 1909 | 8.18 | 6.52 | 8.270909091 | 7.364545455 |
| 1910 | 8.22 | 7.24 | 8.254545455 | 7.379090909 |
| 1911 | 8.18 | 6.73 | 8.225454545 | 7.268181818 |
| 1912 | 8.17 | 7.43 | 8.191818182 | 7.282727273 |
| 1913 | 8.3 | 6.99 | 8.191818182 | 7.251818182 |
| 1914 | 8.59 | 7.92 | 8.225454545 | 7.337272727 |
| 1915 | 8.59 | 8.13 | 8.270909091 | 7.376363636 |
| 1916 | 8.23 | 6.23 | 8.270909091 | 7.252727273 |
| 1917 | 8.02 | 7.25 | 8.238181818 | 7.185454545 |
| 1918 | 8.13 | 7.85 | 8.254545455 | 7.237272727 |
| 1919 | 8.38 | 6.94 | 8.271818182 | 7.202727273 |
| 1920 | 8.36 | 7.19 | 8.288181818 | 7.263636364 |
| 1921 | 8.57 | 7.2 | 8.32 | 7.26 |
| 1922 | 8.41 | 6.66 | 8.340909091 | 7.253636364 |
| 1923 | 8.42 | 7.82 | 8.363636364 | 7.289090909 |
| 1924 | 8.51 | 7.46 | 8.382727273 | 7.331818182 |
| 1925 | 8.53 | 8.26 | 8.377272727 | 7.362727273 |
| 1926 | 8.73 | 8.72 | 8.39 | 7.416363636 |
| 1927 | 8.52 | 7.3 | 8.416363636 | 7.513636364 |
| 1928 | 8.63 | 7.86 | 8.471818182 | 7.569090909 |
| 1929 | 8.24 | 6.96 | 8.481818182 | 7.488181818 |
| 1930 | 8.63 | 7.23 | 8.504545455 | 7.514545455 |
| 1931 | 8.72 | 8 | 8.537272727 | 7.588181818 |
| 1932 | 8.71 | 7.37 | 8.55 | 7.603636364 |
| 1933 | 8.34 | 7.06 | 8.543636364 | 7.64 |
| 1934 | 8.63 | 9.04 | 8.562727273 | 7.750909091 |
| 1935 | 8.52 | 7.33 | 8.563636364 | 7.739090909 |
| 1936 | 8.55 | 7.67 | 8.565454545 | 7.685454545 |
| 1937 | 8.7 | 7.39 | 8.562727273 | 7.564545455 |
| 1938 | 8.86 | 8.12 | 8.593636364 | 7.639090909 |
| 1939 | 8.76 | 8.25 | 8.605454545 | 7.674545455 |
| 1940 | 8.76 | 8.81 | 8.652727273 | 7.842727273 |
| 1941 | 8.77 | 8.83 | 8.665454545 | 7.988181818 |
| 1942 | 8.73 | 8.1 | 8.666363636 | 7.997272727 |
| 1943 | 8.76 | 7.51 | 8.670909091 | 8.01 |
| 1944 | 8.85 | 7.84 | 8.717272727 | 8.080909091 |
| 1945 | 8.58 | 7.57 | 8.712727273 | 7.947272727 |
| 1946 | 8.68 | 7.39 | 8.727272727 | 7.952727273 |
| 1947 | 8.8 | 8.03 | 8.75 | 7.985454545 |
| 1948 | 8.75 | 6.68 | 8.754545455 | 7.920909091 |
| 1949 | 8.59 | 7.05 | 8.73 | 7.823636364 |
| 1950 | 8.37 | 6.77 | 8.694545455 | 7.689090909 |
| 1951 | 8.63 | 7.33 | 8.682727273 | 7.554545455 |
| 1952 | 8.64 | 7.56 | 8.670909091 | 7.439090909 |
| 1953 | 8.87 | 8.11 | 8.683636364 | 7.44 |
| 1954 | 8.56 | 7.04 | 8.665454545 | 7.397272727 |
| 1955 | 8.63 | 6.09 | 8.645454545 | 7.238181818 |
| 1956 | 8.28 | 7.18 | 8.618181818 | 7.202727273 |
| 1957 | 8.73 | 7.52 | 8.622727273 | 7.214545455 |
| 1958 | 8.77 | 9.28 | 8.62 | 7.328181818 |
| 1959 | 8.73 | 7.5 | 8.618181818 | 7.402727273 |
| 1960 | 8.58 | 7.51 | 8.617272727 | 7.444545455 |
| 1961 | 8.8 | 8.12 | 8.656363636 | 7.567272727 |
| 1962 | 8.75 | 7.66 | 8.667272727 | 7.597272727 |
| 1963 | 8.86 | 7.91 | 8.687272727 | 7.629090909 |
| 1964 | 8.41 | 6.83 | 8.645454545 | 7.512727273 |
| 1965 | 8.53 | 7.91 | 8.642727273 | 7.591818182 |
| 1966 | 8.6 | 7.88 | 8.64 | 7.754545455 |
| 1967 | 8.7 | 8.38 | 8.678181818 | 7.863636364 |
| 1968 | 8.52 | 7.73 | 8.659090909 | 7.882727273 |
| 1969 | 8.6 | 7.51 | 8.643636364 | 7.721818182 |
| 1970 | 8.7 | 7.55 | 8.640909091 | 7.726363636 |
| 1971 | 8.6 | 7.1 | 8.642727273 | 7.689090909 |
| 1972 | 8.5 | 7.09 | 8.615454545 | 7.595454545 |
| 1973 | 8.95 | 7.58 | 8.633636364 | 7.588181818 |
| 1974 | 8.47 | 7.72 | 8.598181818 | 7.570909091 |
| 1975 | 8.74 | 7.09 | 8.628181818 | 7.594545455 |
| 1976 | 8.35 | 7.46 | 8.611818182 | 7.553636364 |
| 1977 | 8.85 | 7.63 | 8.634545455 | 7.530909091 |
| 1978 | 8.69 | 7.78 | 8.633636364 | 7.476363636 |
| 1979 | 8.73 | 7.88 | 8.652727273 | 7.49 |
| 1980 | 8.98 | 7.75 | 8.687272727 | 7.511818182 |
| 1981 | 9.17 | 8.23 | 8.73 | 7.573636364 |
| 1982 | 8.64 | 7.35 | 8.733636364 | 7.596363636 |
| 1983 | 9.03 | 7.94 | 8.781818182 | 7.673636364 |
| 1984 | 8.69 | 7.41 | 8.758181818 | 7.658181818 |
| 1985 | 8.66 | 6.71 | 8.775454545 | 7.566363636 |
| 1986 | 8.83 | 8.25 | 8.783636364 | 7.671818182 |
| 1987 | 8.99 | 8.67 | 8.841818182 | 7.781818182 |
| 1988 | 9.2 | 8.1 | 8.873636364 | 7.824545455 |
| 1989 | 8.92 | 7.87 | 8.894545455 | 7.832727273 |
| 1990 | 9.23 | 8.09 | 8.94 | 7.851818182 |
| 1991 | 9.18 | 8.2 | 8.958181818 | 7.892727273 |
| 1992 | 8.84 | 9.03 | 8.928181818 | 7.965454545 |
| 1993 | 8.87 | 7.68 | 8.949090909 | 7.995454545 |
| 1994 | 9.04 | 8.35 | 8.95 | 8.032727273 |
| 1995 | 9.35 | 8.62 | 9.01 | 8.142727273 |
| 1996 | 9.04 | 7.61 | 9.044545455 | 8.224545455 |
| 1997 | 9.2 | 8.41 | 9.078181818 | 8.239090909 |
| 1998 | 9.52 | 8.7 | 9.126363636 | 8.241818182 |
| 1999 | 9.29 | 7.79 | 9.134545455 | 8.213636364 |
| 2000 | 9.2 | 7.72 | 9.16 | 8.2 |
| 2001 | 9.41 | 7.9 | 9.176363636 | 8.182727273 |
| 2002 | 9.57 | 8.03 | 9.211818182 | 8.167272727 |
| 2003 | 9.53 | 8.74 | 9.274545455 | 8.140909091 |
| 2004 | 9.32 | 9.04 | 9.315454545 | 8.264545455 |
| 2005 | 9.7 | 8.57 | 9.375454545 | 8.284545455 |
| 2006 | 9.53 | 8.49 | 9.391818182 | 8.272727273 |
| 2007 | 9.73 | 8.04 | 9.454545455 | 8.311818182 |
| 2008 | 9.43 | 7.57 | 9.475454545 | 8.235454545 |
| 2009 | 9.51 | 8.02 | 9.474545455 | 8.173636364 |
| 2010 | 9.7 | 8.25 | 9.511818182 | 8.215454545 |
| 2011 | 9.52 | 7.35 | 9.540909091 | 8.181818182 |
| 2012 | 9.51 | 8.08 | 9.55 | 8.198181818 |
| 2013 | 9.61 | 9.95 | 9.553636364 | 8.372727273 |

**Step 4: Line Chart representing Comparison Between Global vs Seattle temperature over the years.**

**Step 5: Observations**

1. Correlation Coefficient: 0.9139. Since the Coefficient value is high, we can say that global and Seattle temperature has linear relation and positive correlation.
2. In the year 1958, the Seattle temperature has suddenly decreased even if the global temperature is in the linear way. This indicates that there is sudden change in the weather to cool it down (Snow/ Rain).
3. In the year span of 1888-1898, there is decrease in the global temperature but there is an increase in the temperature of Seattle. This also indicates the sudden catastrophic change in the temperature. One of the reasons of this might be the explosion of volcano in the Mount Rainier (1894).
4. Both lines are increasing linearly. But by observing the graph, we can say that Seattle’s temperature linear coefficient is lower as compared to global’s temperature.