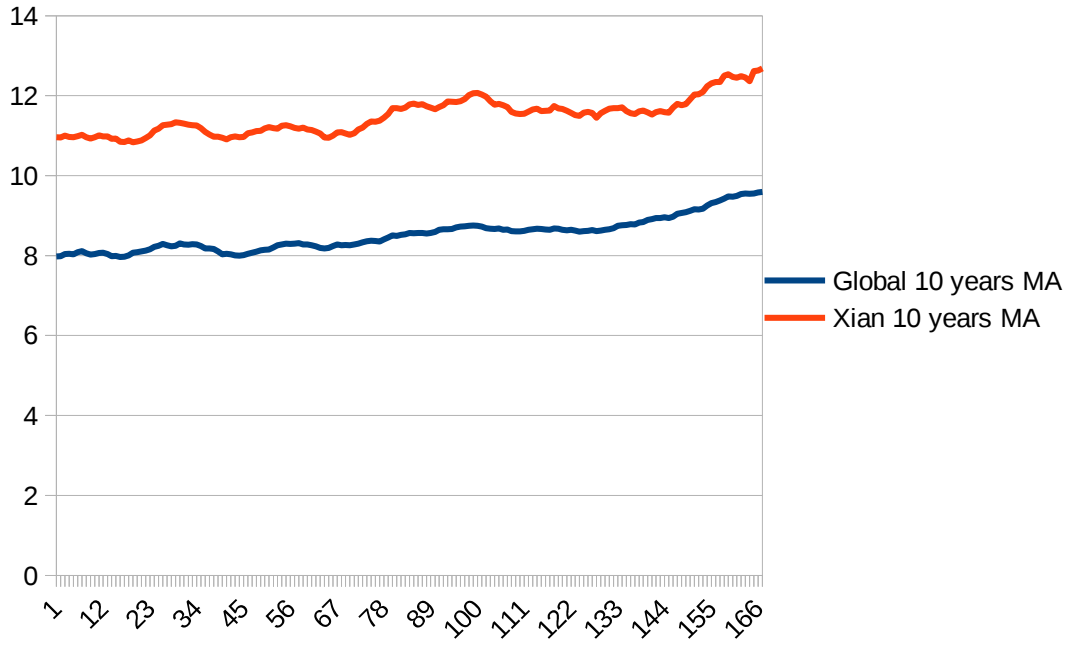
year	avg_temp	Xian	Global 10 years MA	Xian 10 years
1840	7.8	10.81		
1841	7.69	10.26		
1842	8.02	11.05		
1843	8.17	11.12		
1844	7.65	11.01		
1845	7.85	10.91		
1846	8.55	11.49		
1847	8.09	11.24		
1848	7.98	10.79		
1849	7.98	10.94	7.978	10.962
1850	7.9	10.76	7.988	10.957
1851	8.18	10.7	8.037	11.001
1852	8.1	10.73	8.045	10.969
1853	8.04	11.05	8.032	10.962
1854	8.21	11.29	8.088	10.99
1855	8.11	11.2	8.114	11.019
1856	8	10.89	8.059	10.959
1857	7.76	10.91	8.026	10.926
1858	8.1	11.14	8.038	10.961
1859	8.25	11.38	8.065	11.005
1860	7.96	10.5	8.071	10.979
1861	7.85	10.69	8.038	10.978
1862	7.56	10.14	7.984	10.919
1863	8.11	11.15	7.991	10.929
1864	7.98	10.5	7.968	10.85
1865	8.18	11.14	7.975	10.844
1866	8.29	11.28	8.004	10.883
1867	8.44	10.43	8.072	10.835
1868	8.25	11.36	8.087	10.857
1869	8.43	11.59	8.105	10.878
1870	8.2	11.11	8.129	10.939
1871	8.12	11.36	8.156	11.006
1872	8.19	11.35	8.219	11.127
1873	8.35	11.58	8.243	11.17
1874	8.43	11.41	8.288	11.261
1875	7.86	11.25	8.256	11.272
1876	8.08	11.4	8.235	11.284
1877	8.54	10.92	8.245	11.333
1878	8.83	11.22	8.303	11.319
1879	8.17	11.43	8.277	11.303
1880	8.12	10.85	8.269	11.277
1881	8.27	11.23	8.284	11.264
1882	8.13	11.28	8.278	11.257
1883	7.98	10.85	8.241	11.184
1884	7.77	10.54	8.175	11.097
1885	7.92	10.58	8.181	11.03
1886	7.95	10.86	8.168	10.976
1887	7.91	10.91	8.105	10.975
1888	8.09	10.95	8.031	10.948
1889	8.32	11	8.046	10.905
1890	7.97	11.44	8.031	10.964
1891	8.02	11.42	8.006	10.983

1892	8.07	11.04	8	10.959
1893	8.06	10.95	8.008	10.969
1894	8.16	11.44	8.047	11.059
1895	8.15	10.83	8.07	11.084
1896	8.21	11.15	8.096	11.113
1897	8.29	11.01	8.134	11.123
1898	8.18	11.5	8.143	11.178
1899	8.4	11.36	8.151	11.214
1900	8.5	11.14	8.204	11.184
1901	8.54	11.28	8.256	11.17
1902	8.3	11.83	8.279	11.249
1903	8.22	11.05	8.295	11.259
1904	8.09	11.23	8.288	11.238
1905	8.23	10.39	8.296	11.194
1906	8.38	10.92	8.313	11.171
1907	7.95	11.31	8.279	11.201
1908	8.19	11.05	8.28	11.156
1909	8.18	11.23	8.258	11.143
1910	8.22	10.75	8.23	11.104
1911	8.18	10.8	8.194	11.056
1912	8.17	10.77	8.181	10.95
1913	8.3	11.04	8.189	10.949
1914	8.59	11.75	8.239	11.001
1915	8.59	11.2	8.275	11.082
1916	8.23	10.96	8.26	11.086
1917	8.02	10.97	8.267	11.052
1918	8.13	10.72	8.261	11.019
1919	8.38	11.64	8.281	11.06
1920	8.36	11.69	8.295	11.154
1921	8.57	11.25	8.334	11.199
1922	8.41	11.73	8.358	11.295
1923	8.42	11.64	8.37	11.355
1924	8.51	11.67	8.362	11.347
1925	8.53	11.5	8.356	11.377
1926	8.73	11.69	8.406	11.45
1927	8.52	11.89	8.456	11.542
1928	8.63	12.16	8.506	11.686
1929	8.24	11.65	8.492	11.687
1930	8.63	11.47	8.519	11.665
1931	8.72	11.62	8.534	11.702
1932	8.71	12.5	8.564	11.779
1933	8.34	11.88	8.556	11.803
1934	8.63	11.31	8.568	11.767
1935	8.52	11.68	8.567	11.785
1936	8.55	11.22	8.549	11.738
1937	8.7	11.51	8.567	11.7
1938	8.86	11.78	8.59	11.662
1939	8.76	12.16	8.642	11.713
1940	8.76	11.93	8.655	11.759
1941	8.77	12.61	8.66	11.858
1942	8.73	12.42	8.662	11.85
1943	8.76	11.82	8.704	11.844
1944	8.85	11.49	8.726	11.862

1945	8.58	12.18	8.732	11.912
1946	8.68	12.24	8.745	12.014
1947	8.8	11.99	8.755	12.062
1948	8.75	11.82	8.744	12.066
1949	8.59	11.8	8.727	12.03
1950	8.37	11.4	8.688	11.977
1951	8.63	11.48	8.674	11.864
1952	8.64	11.52	8.665	11.774
1953	8.87	12.03	8.676	11.795
1954	8.56	11.16	8.647	11.762
1955	8.63	11.7	8.652	11.714
1956	8.28	11.06	8.612	11.596
1957	8.73	11.58	8.605	11.555
1958	8.77	11.65	8.607	11.538
1959	8.73	11.92	8.621	11.55
1960	8.58	11.89	8.642	11.599
1961	8.8	12.03	8.659	11.654
1962	8.75	11.7	8.67	11.672
1963	8.86	11.48	8.669	11.617
1964	8.41	11.18	8.654	11.619
1965	8.53	11.82	8.644	11.631
1966	8.6	12.16	8.676	11.741
1967	8.7	10.96	8.673	11.679
1968	8.52	11.51	8.648	11.665
1969	8.6	11.47	8.635	11.62
1970	8.7	11.36	8.647	11.567
1971	8.6	11.52	8.627	11.516
1972	8.5	11.51	8.602	11.497
1973	8.95	12.23	8.611	11.572
1974	8.47	11.41	8.617	11.595
1975	8.74	11.55	8.638	11.568
1976	8.35	10.99	8.613	11.451
1977	8.85	12.04	8.628	11.559
1978	8.69	12.11	8.645	11.619
1979	8.73	12.05	8.658	11.677
1980	8.98	11.45	8.686	11.686
1981	9.17	11.56	8.743	11.69
1982	8.64	11.66	8.757	11.705
1983	9.03	11.32	8.765	11.614
1984	8.69	10.88	8.787	11.561
1985	8.66	11.32	8.779	11.538
1986	8.83	11.69	8.827	11.608
1987	8.99	12.26	8.841	11.63
1988	9.2	11.63	8.892	11.582
1989	8.92	11.48	8.911	11.525
1990	9.23	12.09	8.936	11.589
1991	9.18	11.79	8.937	11.612
1992	8.84	11.46	8.957	11.592
1993	8.87	11.17	8.941	11.577
1994	9.04	12.14	8.976	11.703
1995	9.35	12.25	9.045	11.796
1996	9.04	11.36	9.066	11.763
1997	9.2	12.5	9.087	11.787

Sheet1

1998	9.52	12.8	9.119	11.904
1999	9.29	12.7	9.156	12.026
2000	9.2	12.18	9.153	12.035
2001	9.41	12.43	9.176	12.099
2002	9.57	12.82	9.249	12.235
2003	9.53	11.9	9.315	12.308
2004	9.32	12.49	9.343	12.343
2005	9.7	12.24	9.378	12.342
2006	9.53	12.99	9.427	12.505
2007	9.73	12.77	9.48	12.532
2008	9.43	12.13	9.471	12.465
2009	9.51	12.53	9.493	12.448
2010	9.7	12.59	9.543	12.489
2011	9.52	12.08	9.554	12.454
2012	9.51	11.9	9.548	12.362
2013	9.61	14.46	9.556	12.618
2014	9.57		9.581	12.63222222
2015	9.83		9.594	12.68125



1. 步骤：

1.1 使用 SQL 获取数据：

SELECT * FROM city_data WHERE city='Xian';

SELECT * FROM global_data';

1.2 导出 CSV 文件。

1.3 用 LibreOffice Calc 打开 CSV 文件，将数据合并入一张表，分别计算全球和西安市的 10年气温移动

1.4 选择两列移动平均数，绘制折线图。

2. 观察发现

2.1 不难看出，西安平均气温显著高于全球平均气温，这也印证了西安是全国四大火炉之一的美名。

2.2 全球气温一直在显著上升，保护地球刻不容缓。

2.3 从斜率上看，西安的气温上升得更剧烈一些，是不是和这几十年的工业化进程有关？

2.4 有意思的是气温并不是一直上升的，中间还有一些向下的年份，这会是什么原因呢？

MA

平均数。