Data Preparation

1) Select City data by executing below query and export as CSV having 173 rows

   SELECT year, avg_temp as avg_temp FROM city_data where city = 'Melbourne'

2) Select Global data with below query, having 246 Rows exported CSV

   SELECT year, avg_temp as global_avg FROM global_data

3) Import city data CSV into city data excel sheet having 2 columns year and avg_temp

4) Repeat step 3 to import global data in global_data excel sheet

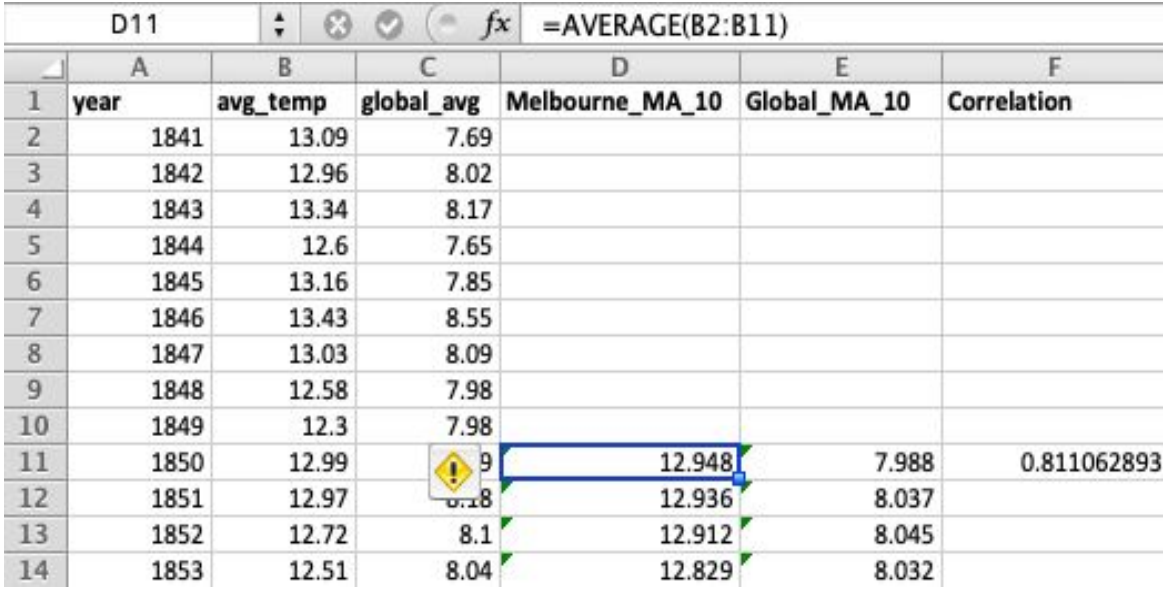
5) Since Melbourne data starts from year 1841 until 2013, just copy rows from global data into city data sheet starting from 1841 upto 2013 and merge.

6) Now city data sheet has 3 columns namely year, avg_temp and global_avg

7) Create Melbourne_MA_10 and Global_MA_10 columns to calculate moving averages to smooth out the edges using AVERAGE function in Excel and selecting first 10 rows.

Key Consideration: Since the temperature is time-series data w.r.t year, we need a comparison graph to compare both data sets. Line charts having year on x-axis and temperature data (city and global) on y axis would be perfect for visualizing such trend.

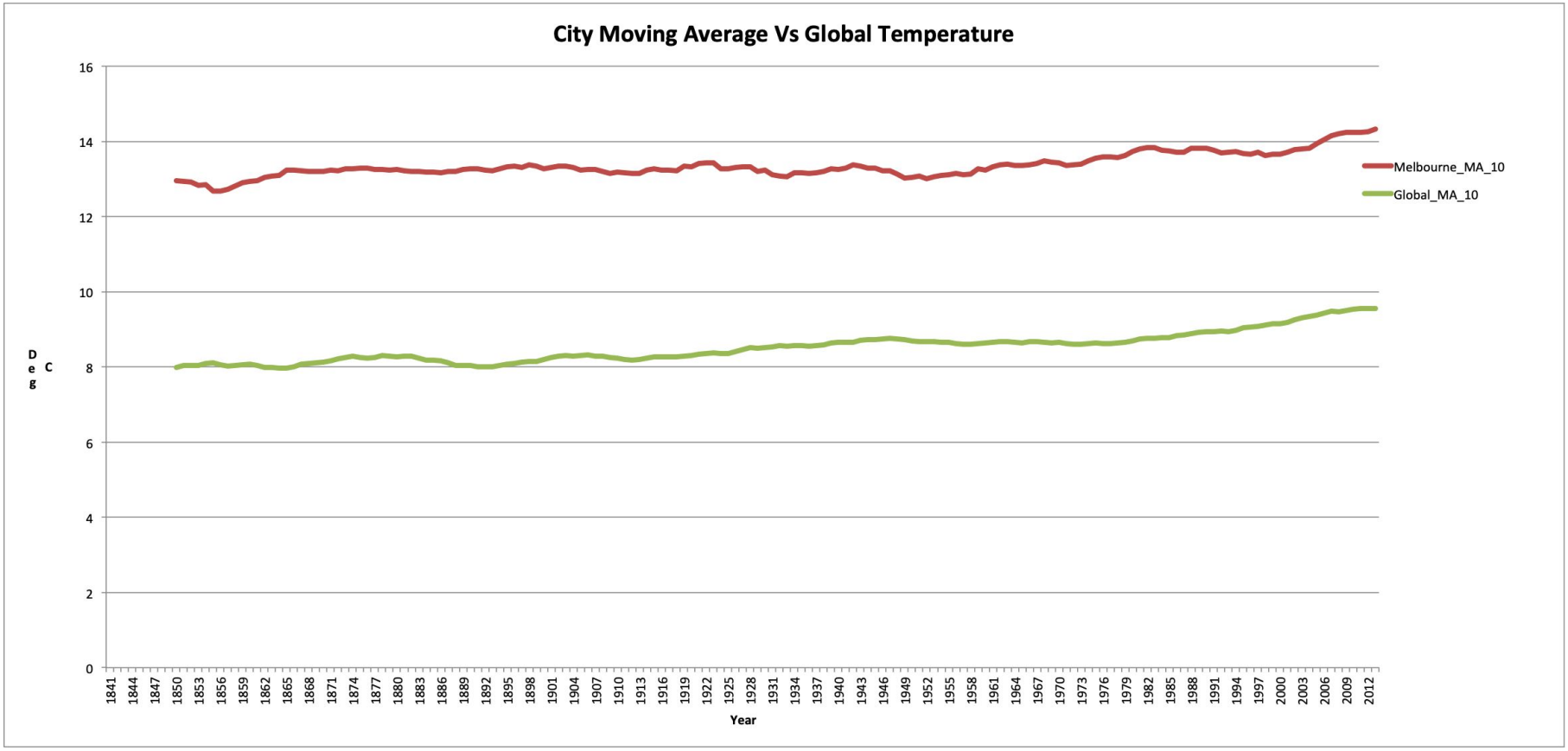
Moving Average calculation



D11 =AVERAGE(B2:B11)

	A	B	C	D	E	F
1	year	avg_temp	global_avg	Melbourne_MA_10	Global_MA_10	Correlation
2	1841	13.09	7.69			
3	1842	12.96	8.02			
4	1843	13.34	8.17			
5	1844	12.6	7.65			
6	1845	13.16	7.85			
7	1846	13.43	8.55			
8	1847	13.03	8.09			
9	1848	12.58	7.98			
10	1849	12.3	7.98			
11	1850	12.99	9	12.948	7.988	0.811062893
12	1851	12.97	8.18	12.936	8.037	
13	1852	12.72	8.1	12.912	8.045	
14	1853	12.51	8.04	12.829	8.032	

Weather Trends



Observations

1) Melbourne is hotter than the global average by approximately 5 degrees and this difference is quite consistent over the entire period from 1841 until 2013.
2) The global temperature started rising consistently in last 100 years starting from year 1911.
3) Melbourne average temperature didn’t follow global trend until year 1950.
4) Melbourne temperature rose just 0.2 degrees until 1950 and approx 1.2 degrees after 1950 and approx 0.8 degrees from 2003 to 2013 (big spike from 2003 as shown in the graph).
5) Global temperatures rose 1.4 degrees in last 100 years
6) Melbourne temperature is rising at a faster rate than global averages.
7) The overall trend is rising temperature both in the city and globally which has high correlation of approx 81% (as shown in excel column correlation).