Step 1: Extraction of data from SQL Database using SQL queries

- Extract the average temperature of the city 'Bangalore' in the country 'India' for all the years using the SQL query:

  select * from city_data where city = 'Bangalore' and country = 'India';
- Extract the global average temperature using the following SQL query:

  select * from global_data;
- Extract the average temperature of the country 'India' for all the cities combined using the following SQL query:

  select year, AVG(avg_temp) from city_data where country = 'India' group by year order by year;

Step 2: Collating all information in Excel:

- Collate the average temperature data from global, country wise (India) and city wise (Bangalore) in a single Excel spreadsheet in 3 different columns, alongside the year.
- The moving average for the global data, country data and city data is calculated over a period of 10 years using the formula AVERAGE() in excel.

  Note:
  - *The average temperature data is not available for Country (India) and City (Bangalore) from 1750 to 1795 and from 1808 to 1812. Also, data is unavailable for city Bangalore for years 1863 and 1864.*

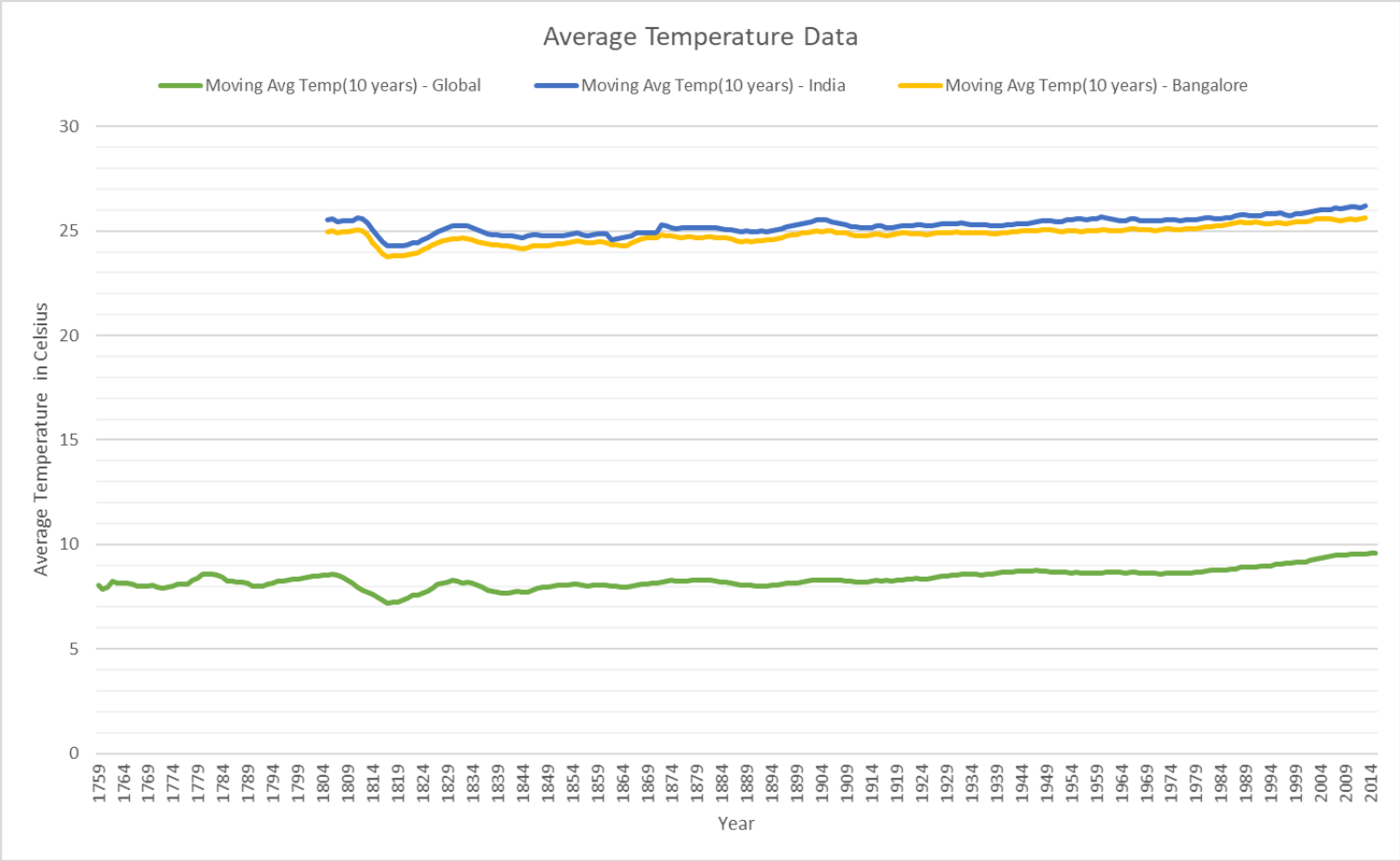
	A	B	C	D	E	F	G
1	Year	Avg Temp (Global)	Avg Temp (India)	Avg Temp (Bangalore)	Moving Avg Temp(10 years) - Global	Moving Avg Temp(10 years) - India	Moving Avg Temp(10 years) - Bangalore
65	1813	7.74	24.86	24.23	7.739	25.414	24.806
66	1814	7.59	24.16	23.91	7.614	25.032	24.454
67	1815	7.24	24.4	23.79	7.482	24.788	24.21
68	1816	6.94	24.02	23.3	7.333	24.488	23.896
69	1817	6.98	24	23.6	7.203	24.288	23.766
70	1818	7.83	24.38	23.94	7.223	24.30333333	23.795
71	1819	7.37	24.05	23.86	7.252	24.26714286	23.80428571
72	1820	7.62	24.35	23.91	7.322	24.2775	23.8175
73	1821	8.09	24.94	24.4	7.445	24.35111111	23.88222222
74	1822	8.19	25.03	24.33	7.559	24.419	23.927
75	1823	7.72	24.94	24.62	7.557	24.427	23.966
76	1824	8.55	25.64	25.1	7.653	24.575	24.085
77	1825	8.39	25.39	24.69	7.768	24.674	24.175
78	1826	8.36	25.45	24.88	7.91	24.817	24.333
79	1827	8.81	25.56	24.67	8.093	24.973	24.44
80	1828	8.17	25.22	24.61	8.127	25.057	24.507
81	1829	7.94	25.03	24.46	8.184	25.155	24.567
82	1830	8.52	25.27	24.39	8.274	25.247	24.615
83	1831	7.64	24.83	24.43	8.229	25.236	24.618
84	1832	7.45	25.04	24.66	8.155	25.237	24.651

Avg_temp

Ready

Step 3: Plotting a Line chart in Microsoft Excel

- The collated moving average temperatures of the globe, India and Bangalore are plotted in a “Line plot” in excel as shown below.
- All axes titles, legends and chart titles are added for better interpretation.



Step 4: Interpretation of the plotted data

- The average temperature of Bangalore and India as a country in general is close to 20 degrees Celsius higher than the global average temperature at any given year.
- There has been a temperature drop of close to 2 degrees Celsius from 1809 to 1819 and the temperature rose back up by 2 degrees Celsius from 1819 to 1829. This trend is observed globally as well as in India and Bangalore specifically.
- The average temperature of Bangalore is very slightly lower (Close to 1 degree Celsius) than the overall average temperature of all other cities in India at any given year.
- The average temperature of the world is seen increasing almost linearly by 1 degrees Celsius from around 1979 to 2015. This trend is observed in Bangalore and India in general too. This is equivalent of 1 degree rise in temperature for every 35 years. If this trend continues, then around the year 2365, the average temperature of the globe would be around 20 degrees Celsius and the average temperature of Bangalore and India would be around 36 degrees Celsius.