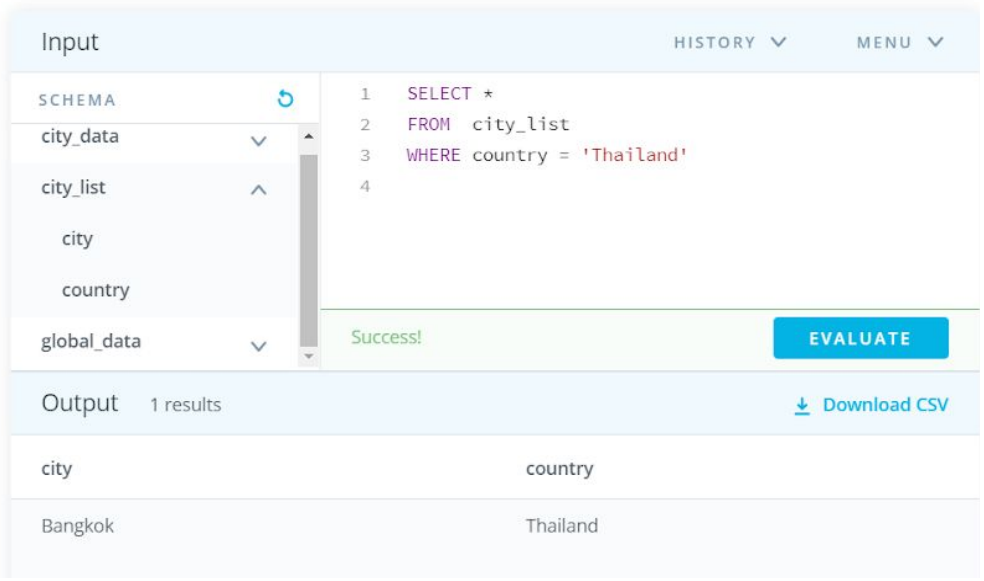
Exploring Weather Trends

- **Extract the data from the database :**
    - Choose the nearest town which mine is Bankok, Thailand.



    - Extract the city and global data in the same file by using join function. Then,download the CSV file.

```
SELECT      g.year,
            c.city,
            c.country,
            c.avg_temp AS city_avg_temp,
            g.avg_temp AS global_avg_temp
FROM  global_data g
FULL OUTER JOIN  city_data  c
ON          c.year = g.year
WHERE c.city = 'Bangkok'
```

Input HISTORY MENU

SCHEMA

city_data

city_list

global_data

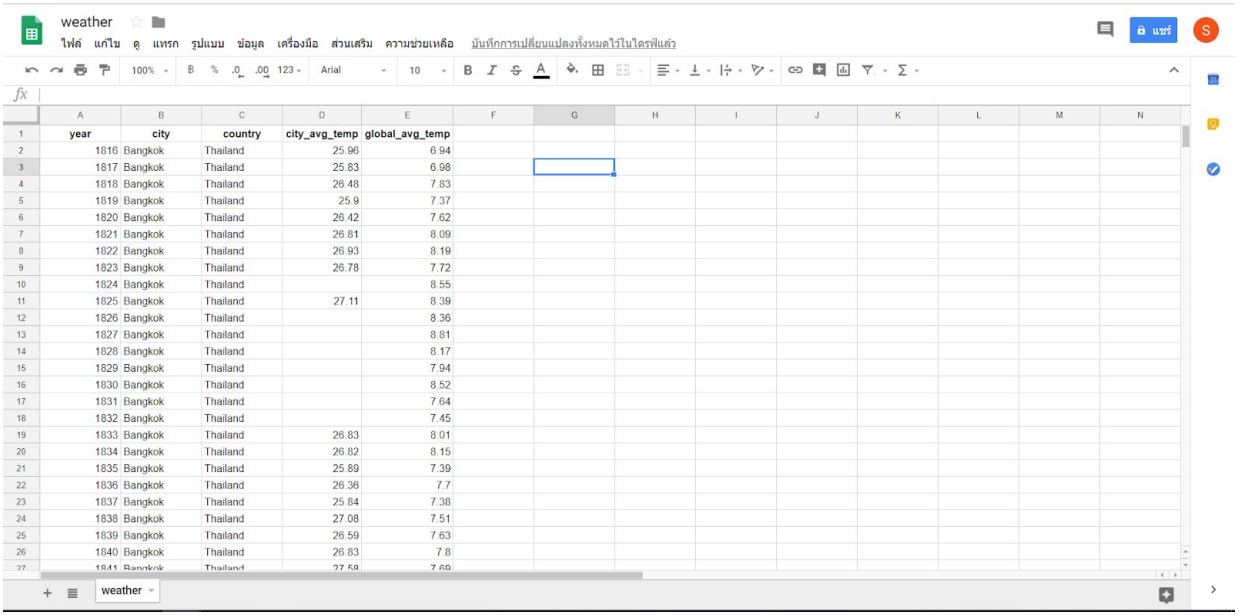
```
SELECT  g.year,
        c.city,
        c.country,
        c.avg_temp AS city_avg_temp,
        g.avg_temp AS global_avg_temp
FROM  global_data g
FULL OUTER JOIN  city_data  c
```

Success! EVALUATE

Output 198 results Download CSV

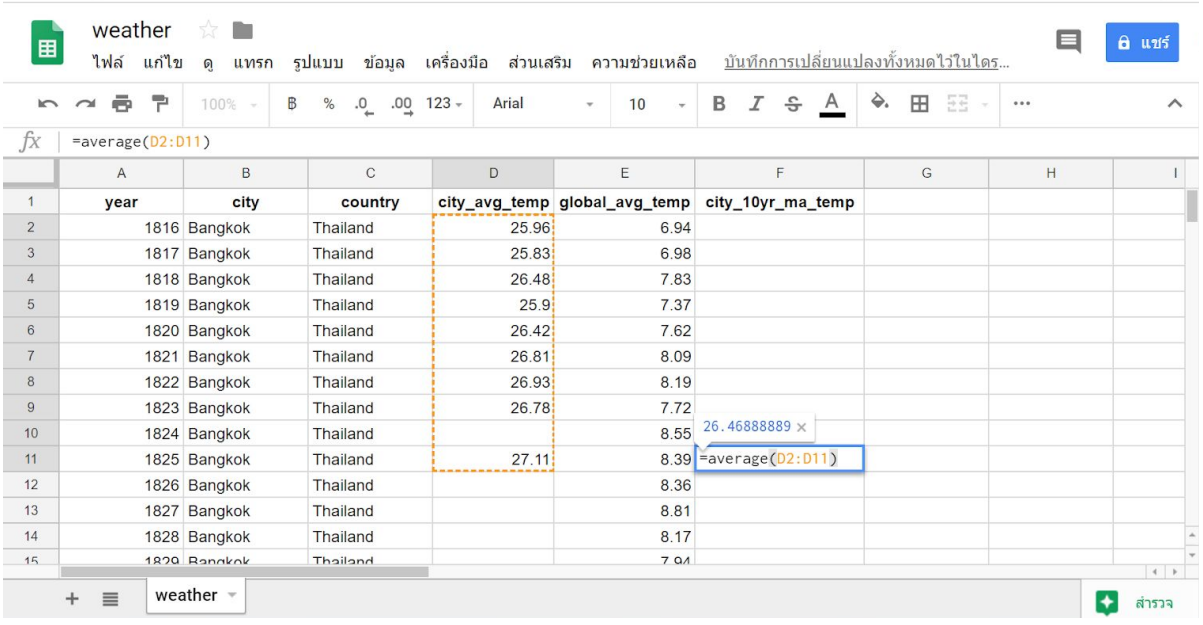
year	city	country	city_avg_temp	global_avg_temp
1816	Bangkok	Thailand	25.96	6.94
1817	Bangkok	Thailand	25.83	6.98
1818	Bangkok	Thailand	26.48	7.83
1819	Bangkok	Thailand	25.90	7.37
1820	Bangkok	Thailand	26.42	7.62
1821	Bangkok	Thailand	26.81	8.09
1822	Bangkok	Thailand	26.93	8.19

- **Prepare the data to be visualized in the chart:**
    - Open the CSV file by google spradsheet



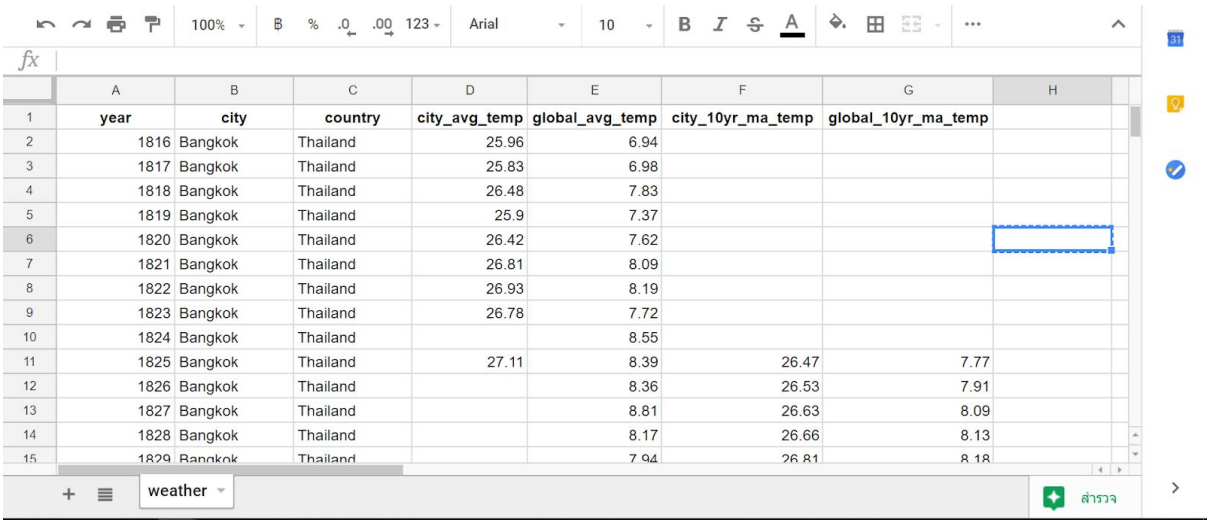
	year	city	country	city_avg_temp	global_avg_temp
2	1816	Bangkok	Thailand	25.96	6.94
3	1817	Bangkok	Thailand	25.83	6.98
4	1818	Bangkok	Thailand	26.48	7.83
5	1819	Bangkok	Thailand	25.9	7.37
6	1820	Bangkok	Thailand	26.42	7.62
7	1821	Bangkok	Thailand	26.81	8.09
8	1822	Bangkok	Thailand	26.93	8.19
9	1823	Bangkok	Thailand	26.78	7.72
10	1824	Bangkok	Thailand		8.55
11	1825	Bangkok	Thailand	27.11	8.39
12	1826	Bangkok	Thailand		8.36
13	1827	Bangkok	Thailand		8.81
14	1828	Bangkok	Thailand		8.17
15	1829	Bangkok	Thailand		7.94
16	1830	Bangkok	Thailand		8.52
17	1831	Bangkok	Thailand		7.64
18	1832	Bangkok	Thailand		7.45
19	1833	Bangkok	Thailand	26.83	8.01
20	1834	Bangkok	Thailand	26.82	8.15
21	1835	Bangkok	Thailand	25.89	7.39
22	1836	Bangkok	Thailand	26.36	7.7
23	1837	Bangkok	Thailand	25.84	7.38
24	1838	Bangkok	Thailand	27.08	7.51
25	1839	Bangkok	Thailand	26.59	7.63
26	1840	Bangkok	Thailand	26.83	7.8

- Calculate the city and global's moving average. The 10-year moving average was calculated to see the trend. It was calculated as below:



=average(D2:D11)

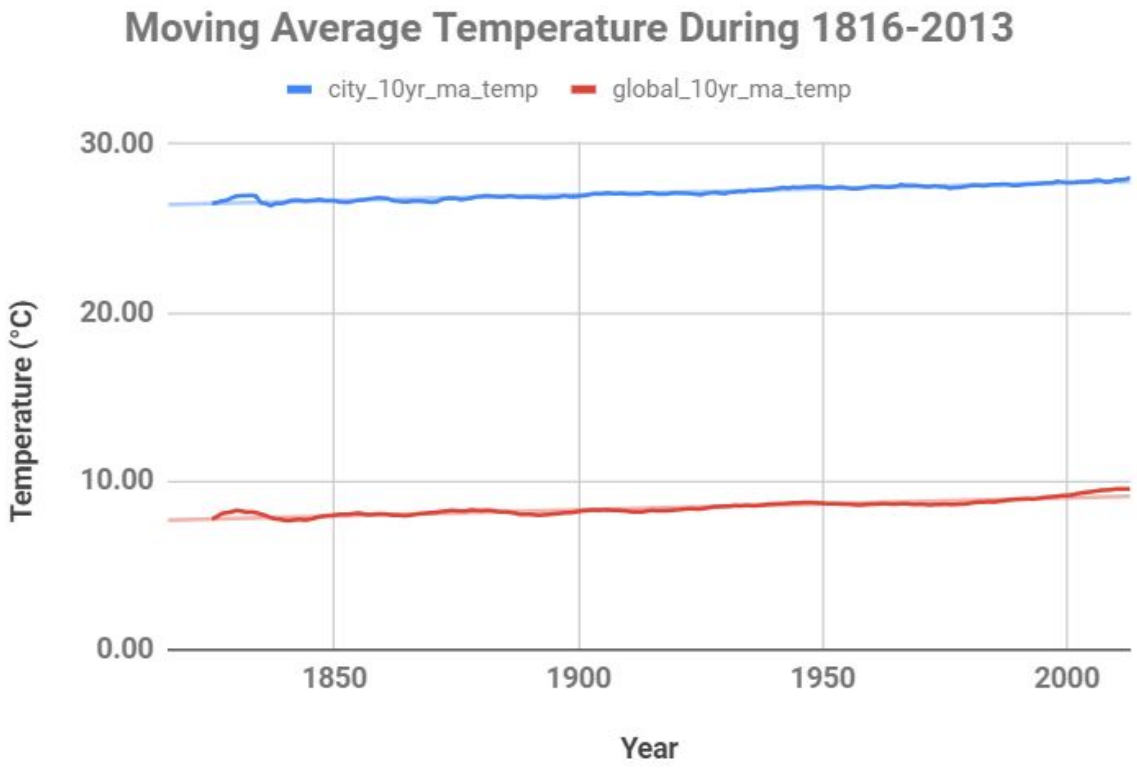
	year	city	country	city_avg_temp	global_avg_temp	city_10yr_ma_temp
2	1816	Bangkok	Thailand	25.96	6.94	
3	1817	Bangkok	Thailand	25.83	6.98	
4	1818	Bangkok	Thailand	26.48	7.83	
5	1819	Bangkok	Thailand	25.9	7.37	
6	1820	Bangkok	Thailand	26.42	7.62	
7	1821	Bangkok	Thailand	26.81	8.09	
8	1822	Bangkok	Thailand	26.93	8.19	
9	1823	Bangkok	Thailand	26.78	7.72	
10	1824	Bangkok	Thailand		8.55	26.46888889
11	1825	Bangkok	Thailand	27.11	8.39	=average(D2:D11)
12	1826	Bangkok	Thailand		8.36	
13	1827	Bangkok	Thailand		8.81	
14	1828	Bangkok	Thailand		8.17	
15	1829	Bangkok	Thailand		7.94	



	A	B	C	D	E	F	G	H
1	year	city	country	city_avg_temp	global_avg_temp	city_10yr_ma_temp	global_10yr_ma_temp	
2	1816	Bangkok	Thailand	25.96	6.94			
3	1817	Bangkok	Thailand	25.83	6.98			
4	1818	Bangkok	Thailand	26.48	7.83			
5	1819	Bangkok	Thailand	25.9	7.37			
6	1820	Bangkok	Thailand	26.42	7.62			
7	1821	Bangkok	Thailand	26.81	8.09			
8	1822	Bangkok	Thailand	26.93	8.19			
9	1823	Bangkok	Thailand	26.78	7.72			
10	1824	Bangkok	Thailand		8.55			
11	1825	Bangkok	Thailand	27.11	8.39	26.47	7.77	
12	1826	Bangkok	Thailand		8.36	26.53	7.91	
13	1827	Bangkok	Thailand		8.81	26.63	8.09	
14	1828	Bangkok	Thailand		8.17	26.66	8.13	
15	1829	Bangkok	Thailand		7.94	26.81	8.18	

weather

- **Create a line chart:**



Due to the line chart,there are four observations.

1. Comparing to the global average changing, Bangkok's temperature has the similar pattern and both graphs move into the same direction. Temperature is increasing overtime.

2. Bangkok is significantly hotter than global average in the whole time. The difference seems consistent over time (around 18 °C). However, it could be seen that the gap is a little bit lesser around 2000-2013 due to global average peaking.

3. The overall trend is getting hotter. The present average temperature is increasing faster than the past. The good example is the global chart line. Comparing to the trendline, it could be seen that the pattern of global average rising seems fluctuated, especially during 2000-2013 the chartline is obviously above the trend line. To be more specification, if we calculate the slope of the graph, overall global slope (1816-2013) is 7.18E-03 but the slope in recent decade (during 2000-2013) is turnout to be 0.0324 which means the temperature is rising faster than what we expected.

4. The difference between Bangkok and global temperature on average is that Bangkok trend have been more consistent than global trend. Bangkok's chart line shows the average line is still near the trend line. In addition, the slope of the whole city's average is around 7.01E-03 and the slope during 2000-2013 is 0.0173. Besides it rising faster than the past, it could be seen that in recent decade the global is warming around 1.87 times as fast as Bangkok's average.