

探索未来气候发展趋势

一、从使用 SQL 从数据库中提取数据

1、city_list 中查询所在城市信息

输入：

```
SELECT *
FROM city_list
WHERE city = 'Shenzhen';
```

结果：

Input

HISTORY ▾MENU ▾

SCHEMA

city_data ▾

city_list ▾

global_data ▴

year

avg_temp ▾

1 SELECT *

2 FROM city_list

3 WHERE city = 'Shenzhen';

Success!

EVALUATE

Output 1 results

Download CSV

city	country
Shenzhen	Hong Kong

2、city_data 中查询所在城市的气温数据并导出 CSV 文件

输入：

```
SELECT *
FROM city_data
WHERE city = 'Shenzhen';
```

结果：

Input

HISTORY ▾MENU ▾

SCHEMA

city_data ▾

city_list ▾

global_data ▴

year

avg_temp ▾

1 SELECT *

2 FROM city_data

3 WHERE city = 'Shenzhen';

4

Success!

EVALUATE

Output 174 results

Download CSV

year	city	country	avg_temp
1840	Shenzhen	Hong Kong	23.71
1841	Shenzhen	Hong Kong	20.76

3、global_data 查询全球气温数据并导出 CSV 文件

输入：

```
SELECT *
FROM global_data
WHERE year BETWEEN '1840' AND '2013';
```

结果：

The screenshot shows a data query interface. On the left, under 'Input', there is a 'SCHEMA' section with a list of tables: 'city_data', 'city_list', 'global_data', 'year', and 'avg_temp'. The 'global_data' table is selected. In the center, the SQL query is entered: `SELECT * FROM global_data WHERE year BETWEEN '1840' AND '2013';`. Below the query, there is a 'Success!' message and an 'EVALUATE' button. On the right, under 'Output', it says '174 results' and there is a 'Download CSV' button. Below this, a table is shown with two columns: 'year' and 'avg_temp'. The first two rows of data are visible: (1840, 7.80) and (1841, 7.69).

year	avg_temp
1840	7.80
1841	7.69

二、打开 CSV 工具

EXCEL

三、计算移动平均值、绘制线条图

- 1、使用 AVERAGE 计算每十年的城市移动平均气温及全球移动平均气温
深圳移动平均气温：

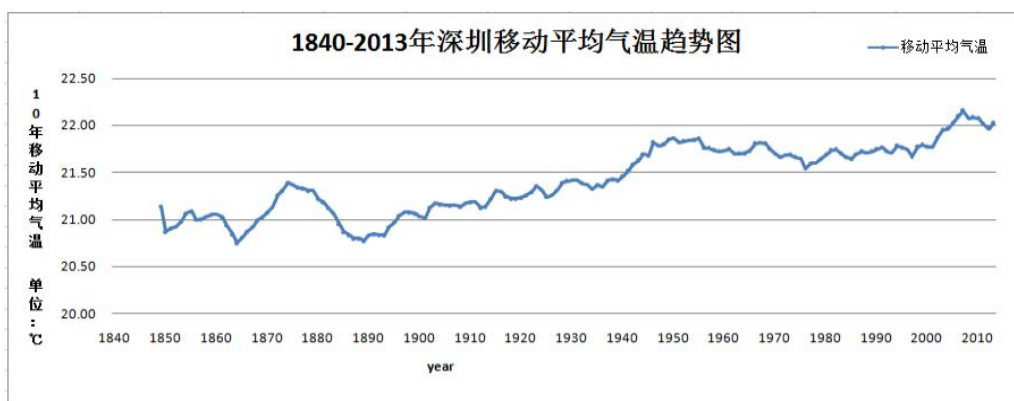
The screenshot shows an Excel spreadsheet. The formula bar at the top displays the formula `=AVERAGE(D3:D12)`. The spreadsheet has columns A through E. Column A contains years from 1840 to 1855. Column B contains the city 'Shenzhen'. Column C contains the country 'Hong Kong'. Column D contains the average temperature 'avg_temp'. Column E contains the 10-year moving average '10-year-ma (深圳)'. The data is as follows:

	A	B	C	D	E
1	year	city	country	avg_temp	10-year-ma (深圳)
2	1840	Shenzhen	Hong Kong	23.71	
3	1841	Shenzhen	Hong Kong	20.76	
4	1842	Shenzhen	Hong Kong	20.96	
5	1843	Shenzhen	Hong Kong	21.05	
6	1844	Shenzhen	Hong Kong	20.66	
7	1845	Shenzhen	Hong Kong	20.66	
8	1846	Shenzhen	Hong Kong	21.28	
9	1847	Shenzhen	Hong Kong	20.91	
10	1848	Shenzhen	Hong Kong	20.55	
11	1849	Shenzhen	Hong Kong	20.85	21.14
12	1850	Shenzhen	Hong Kong	20.87	20.87
13	1851	Shenzhen	Hong Kong	21.12	20.91
14	1852	Shenzhen	Hong Kong	21.1	20.92
15	1853	Shenzhen	Hong Kong	21.61	20.98
16	1854	Shenzhen	Hong Kong	21.47	21.06
17	1855	Shenzhen	Hong Kong	20.9	21.08

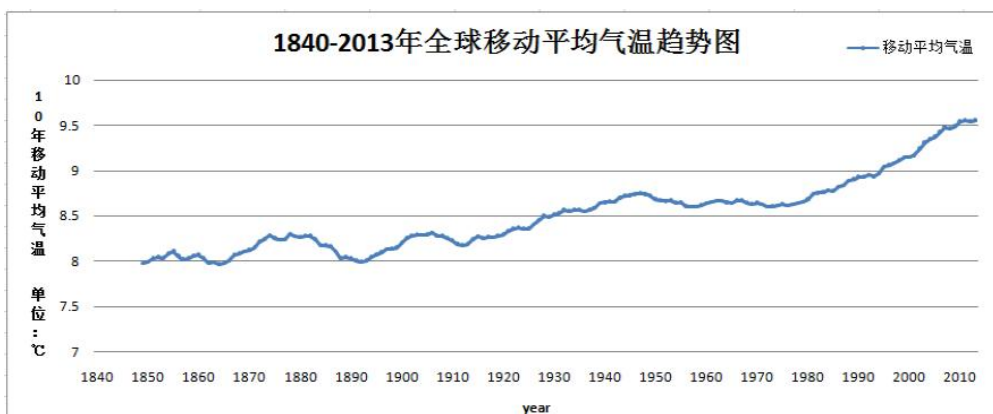
全球移动平均气温：

C11 fx =AVERAGE(B2:B11)			
	A	B	C
1	year	avg_temp	10-year-ma (全球)
2	1840	7.8	
3	1841	7.69	
4	1842	8.02	
5	1843	8.17	
6	1844	7.65	
7	1845	7.85	
8	1846	8.55	
9	1847	8.09	
10	1848	7.98	
11	1849	7.98	7.978
12	1850	7.9	7.988
13	1851	8.18	8.037
14	1852	8.1	8.045
15	1853	8.04	8.032
16	1854	8.21	8.088
17	1855	8.11	8.114
18	1856	8	8.059

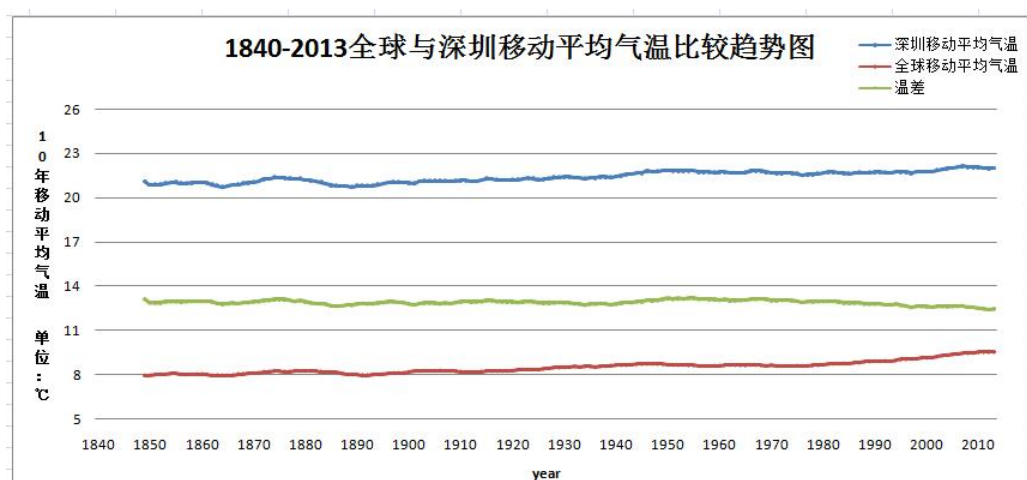
2、绘制折线图



1840-2013 年深圳移动平均气温趋势图



1840-2013 年全球移动平均气温趋势图



1840-2013 全球与深圳移动平均气温比较趋势图

四、观察

1、与全球气温相比，我所在的城市气温如何？

所在的城市深圳气温与全球气温相比，高 10° 左右，比较温暖的城市。

2、长期气温差异是否一致？

长期温差保持在 12°C - 13°C 之间，长期气温差异基本一致。

3、长期以来，你所在城市气温变化与全球平均气温变化相比如何？

气温在逐年升高，特别是在近 30 年温度上升的趋势变快。

4、预计未来全球气温和所在城市的气温趋势？

从图上知，气温还是呈现上升趋势，预计未来温度会逐年缓慢上升。