

## Homework #2

Name: 温承彦

SID: 12332279

### Problem 1: Significant earthquakes since 2150 B.C.

**1.1 [5 points]** Compute the total number of deaths caused by earthquakes since 2150 B.C. in each country, and then print the top ten countries along with the total number of deaths.

**Answer:**

Through PS2.ipynb, the output is calculated as follows:

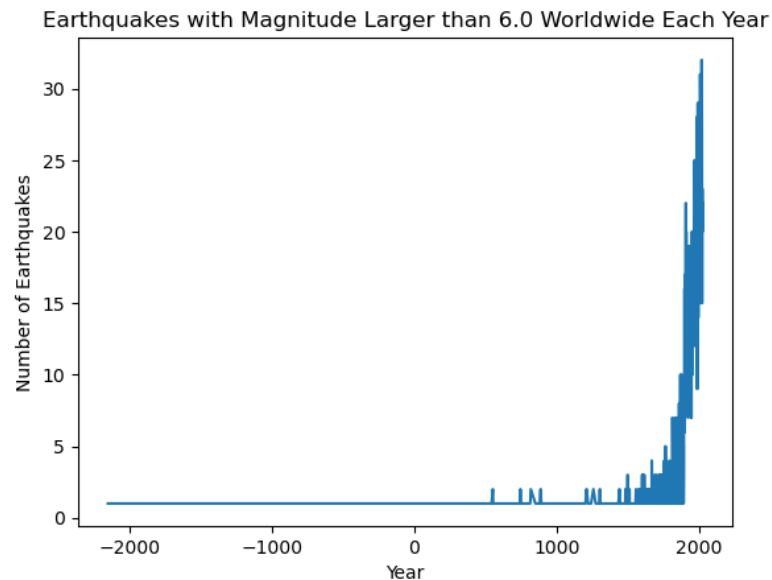
	Country	Deaths
28	CHINA	2075045.0
140	TURKEY	1188881.0
65	IRAN	1011449.0
69	ITALY	498478.0
131	SYRIA	439224.0
58	HAITI	323478.0
10	AZERBAIJAN	317219.0
71	JAPAN	279085.0
6	ARMENIA	191890.0
102	PAKISTAN	145083.0

**1.2 [10 points]** Compute the total number of earthquakes with magnitude larger than 6.0 (use column Mag as the magnitude) worldwide each year, and then plot the time series. Do you observe any trend? Explain why or why not?

**Answer:**

From the graph, we can see that the number of earthquakes with a magnitude greater than 6 is showing a gradually increasing trend. The reason for this may be the increasing concentration of the population in urban areas, which means that more buildings and infrastructure are

susceptible to earthquake impacts, resulting in greater earthquake. And with the continuous advancement of earthquake monitoring methods, we can observe more large-scale seismic events



**1.3 [10 points]** Write a function `CountEq_LargestEq` that returns both (1) the total number of earthquakes since 2150 B.C. in a given country AND (2) the date of the largest earthquake ever happened in this country. Apply `CountEq_LargestEq` to every country in the file, report your results in a descending order.

**Answer:**

Through PS2.ipynb, the output is calculated as follows:

```

Country Total Earthquakes \
0 CHINA 620
1 JAPAN 414
2 INDONESIA 411
3 IRAN 384
4 TURKEY 335
.. ...
132 GRENADA 1
131 NORWAY 1
130 SIERRA LEONE 1
129 IRELAND 1
156 NaN 0

Largest Earthquake Info
0 Year Mo Dy
981 1668 7.0 25.0
1 Year Mo Dy
5742 2011 3.0 11.0
2 Year Mo Dy
5340 2004 12.0 26.0
3 Year Mo Dy
237 856 12.0 22.0
4 Year Mo Dy
3412 1939 12.0 26.0
...
.. Empty DataFrame
Columns: [Year, Mo, Dy]
Index: []
131 Year Mo Dy
1568 1819 8.0 31.0
130 Year Mo Dy
1443 1795 5.0 20.0
129 Empty DataFrame
Columns: [Year, Mo, Dy]
Index: []
156 None

[157 rows x 3 columns]

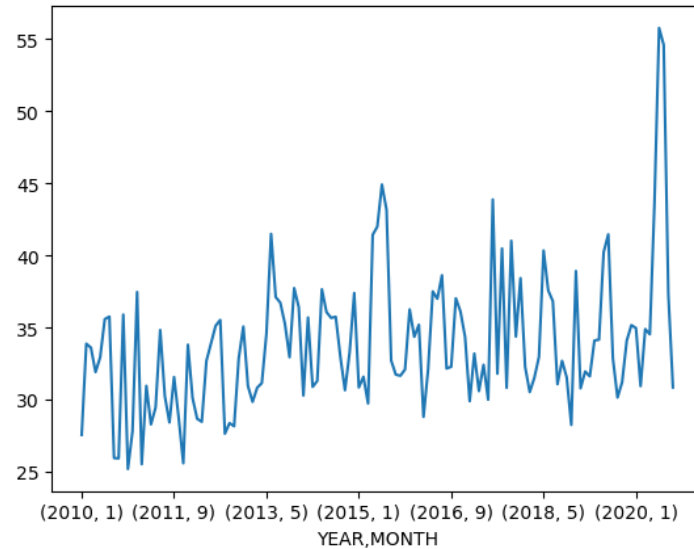
```

## Problem 2: Wind speed in Shenzhen during the past 10 years

**[10 points]** Plot monthly averaged wind speed as a function of the observation time. Is there a trend in monthly averaged wind speed within the past 10 years?

### Answer:

From the graph, it can be seen that the overall wind speed shows a year-on-year increasing trend.



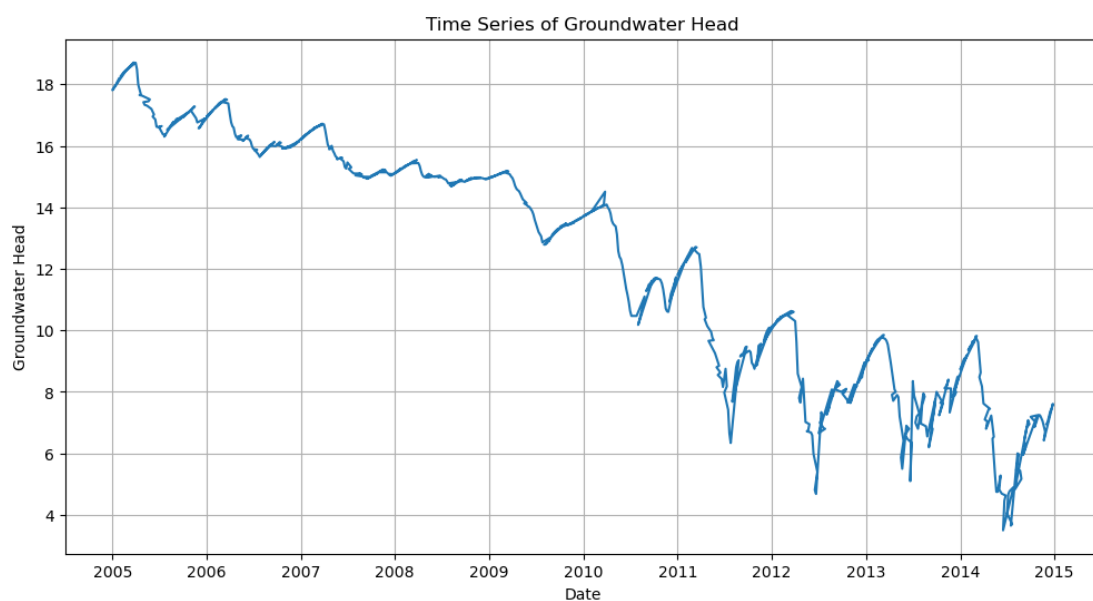
### Problem 3: Explore a data set

**3.1 [5 points]** Load the csv, XLS, or XLSX file, and clean possible data points with missing values or bad quality.

**3.2 [5 points]** Plot the time series of a certain variable.

**3.3 [5 points]** Conduct at least 5 simple statistical checks with the variable, and report your findings.

**Answer:**



Mean: 12.365480153649171

Variance: 13.401920955054331

Minimum value: 3.5

Maximum value: 18.71

Median: 13.280000000000000