

## 2.1

第一题和上课时候老师讲的内容思路比较接近，主要用到了 pandas 里面 groupby 以及一些数据筛选的思路，然后将挑选出的结果进行计算。

```
import pandas as pd
import matplotlib.pyplot as plt

Sig_Eqs = pd.read_csv("earthquakes.tsv", sep='\t') #将原文件导入
Sig_Eqs.head()

#1.1
Sig_Eqs.groupby(['Country']).sum('Total Deaths').sort_values("Total Deaths",
ascending=False).head(10) #通过国家聚类，计算总死亡人数，并按照降序排列，列出前十名

#1.2
newset=Sig_Eqs.loc[(Sig_Eqs['Mag']>6 )].groupby(['Year']).count() #建立一个新的
newset,选出震级大于6的，并聚类计算
newset['Country'].plot()

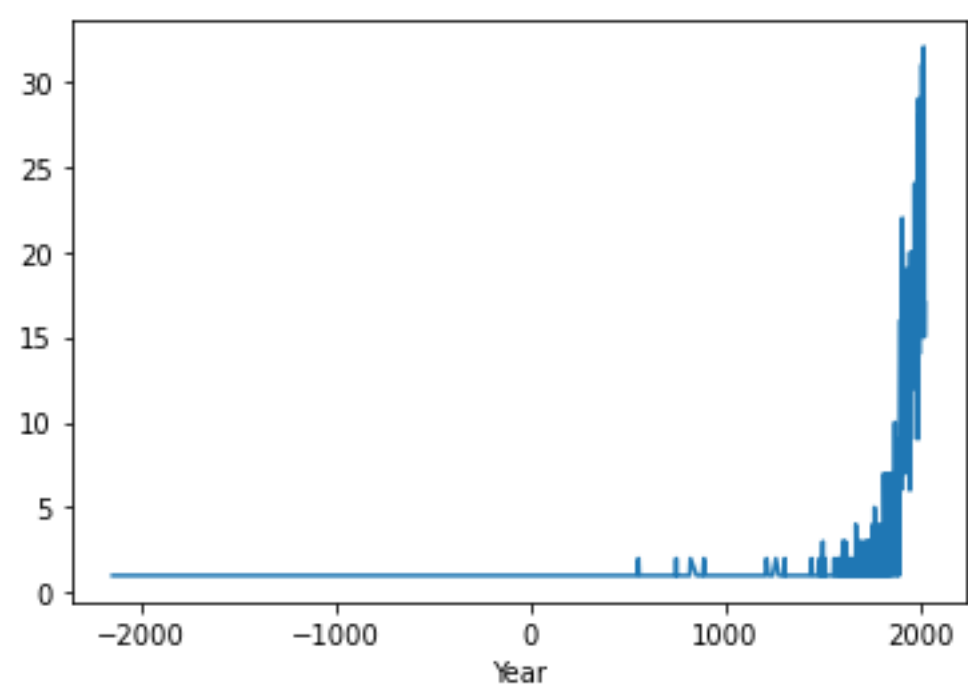
#1.3
def CountEq_LargestEq(country_input):
    number = Sig_Eqs.loc[(Sig_Eqs['Country'] == country_input)].shape[0] #选出国家
    mag = Sig_Eqs.loc[(Sig_Eqs['Country'] ==
country_input)].sort_values('Mag').head(2) #震级进行排序
    date = str(int(mag.iat[0,1]))+'-'+str(mag.iat[0,2])+'-'+str(mag.iat[0,3]) #选
出最大地震的时间
    print('the total number of earthquakes since 2150 B.C. in '+country_input+'is
'+str(number))
    print('the date of the largest earthquake ever happened in '+country_input+'is
'+str(date))

import numpy as np
Sig_Eqs = Sig_Eqs.drop(index=0)
Sig_Eqs = Sig_Eqs.drop(index=6271) #去掉无用列
country_input_array = Sig_Eqs['Country'].apply(str).unique()
country_input_array_sorted = sorted(country_input_array,key =
str.lower,reverse=True)
country_input_array_sorted = np.array(country_input_array_sorted)
for x in country_input_array_sorted: #循环，打印出所有国家发生的最大地震
    country_input = x
    CountEq_LargestEq(country_input)
```

1.1

Country	Year	...	Total Houses Damaged	Description
CHINA	1089016.0	...	237.0	
TURKEY	518673.0	...	99.0	
IRAN	676454.0	...	150.0	
SYRIA	32336.0	...	0.0	
ITALY	546945.0	...	37.0	
JAPAN	748316.0	...	100.0	
HAITI	31549.0	...	13.0	
AZERBAIJAN	27941.0	...	10.0	
INDONESIA	777839.0	...	310.0	
ARMENIA	19297.0	...	0.0	

1.2



随着时间的推移，超过六级的地震数目越来越多，我认为主要有两个原因，第一个是随着科技的发展，对于地震的检测手段检测能力进一步增加，更多的地震可以被检测出来，第二个是因为随着人类人口的增长，人类活动频繁，使得地质的活动也在慢慢增加，所以六级以上的地震数目在增加。

1.3

内容比较长，将所有国家的结果 plot 了出来。  
the total number of earthquakes since 2150 B.C. in ZAMBIA is 1  
the date of the largest earthquake ever happened in ZAMBIA is 2017-2.0-24.0  
the total number of earthquakes since 2150 B.C. in YEMEN is 10  
the date of the largest earthquake ever happened in YEMEN is 1991-11.0-22.0  
the total number of earthquakes since 2150 B.C. in WALLIS AND FUTUNA (FRENCH TERRITORY) is 1  
the date of the largest earthquake ever happened in WALLIS AND FUTUNA (FRENCH TERRITORY) is 1993-3.0-12.0

the total number of earthquakes since 2150 B.C. in VIETNAM is 5  
the date of the largest earthquake ever happened in VIETNAM is 2005-8.0-5.0  
the total number of earthquakes since 2150 B.C. in VENEZUELA is 66  
the date of the largest earthquake ever happened in VENEZUELA is 2018-4.0-3.0  
the total number of earthquakes since 2150 B.C. in VANUATU is 54  
the date of the largest earthquake ever happened in VANUATU is 2018-12.0-15.0  
the total number of earthquakes since 2150 B.C. in UZBEKISTAN is 14  
the date of the largest earthquake ever happened in UZBEKISTAN is 1490-2.0-20.0  
the total number of earthquakes since 2150 B.C. in USA TERRITORY is 40  
the date of the largest earthquake ever happened in USA TERRITORY is 2010-5.0-29.0  
the total number of earthquakes since 2150 B.C. in USA is 271  
the date of the largest earthquake ever happened in USA is 2007-8.0-17.0  
the total number of earthquakes since 2150 B.C. in URUGUAY is 1  
the date of the largest earthquake ever happened in URUGUAY is 1888-6.0-5.0  
the total number of earthquakes since 2150 B.C. in UKRAINE is 8  
the date of the largest earthquake ever happened in UKRAINE is 1872-12.0-26.0  
the total number of earthquakes since 2150 B.C. in UK TERRITORY is 2  
the date of the largest earthquake ever happened in UK TERRITORY is 1983-11.0-30.0  
the total number of earthquakes since 2150 B.C. in UK is 13  
the date of the largest earthquake ever happened in UK is 2007-4.0-28.0  
the total number of earthquakes since 2150 B.C. in UGANDA is 4  
the date of the largest earthquake ever happened in UGANDA is 1994-2.0-5.0  
the total number of earthquakes since 2150 B.C. in TURKMENISTAN is 11  
the date of the largest earthquake ever happened in TURKMENISTAN is 1983-4.0-2.0  
the total number of earthquakes since 2150 B.C. in TURKEY is 330  
the date of the largest earthquake ever happened in TURKEY is 2004-7.0-30.0  
the total number of earthquakes since 2150 B.C. in TUNISIA is 9  
the date of the largest earthquake ever happened in TUNISIA is 1962-2.0-18.0  
the total number of earthquakes since 2150 B.C. in TRINIDAD AND TOBAGO is 8  
the date of the largest earthquake ever happened in TRINIDAD AND TOBAGO is 2006-9.0-29.0  
the total number of earthquakes since 2150 B.C. in TONGA is 22  
the date of the largest earthquake ever happened in TONGA is 1949-8.0-6.0  
the total number of earthquakes since 2150 B.C. in TOGO is 2  
the date of the largest earthquake ever happened in TOGO is 1788-nan-nan  
the total number of earthquakes since 2150 B.C. in THAILAND is 4  
the date of the largest earthquake ever happened in THAILAND is 2006-12.0-12.0  
the total number of earthquakes since 2150 B.C. in TANZANIA is 8  
the date of the largest earthquake ever happened in TANZANIA is 2017-5.0-25.0  
the total number of earthquakes since 2150 B.C. in TAJIKISTAN is 26  
the date of the largest earthquake ever happened in TAJIKISTAN is 2006-8.0-18.0  
the total number of earthquakes since 2150 B.C. in TAIWAN is 98  
the date of the largest earthquake ever happened in TAIWAN is 2006-11.0-13.0  
the total number of earthquakes since 2150 B.C. in SYRIA is 33

the date of the largest earthquake ever happened in SYRIAis 1151-nan-nan  
 the total number of earthquakes since 2150 B.C. in SWITZERLANDis 31  
 the date of the largest earthquake ever happened in SWITZERLANDis 2006-12.0-8.0  
 the total number of earthquakes since 2150 B.C. in SUDANis 1  
 the date of the largest earthquake ever happened in SUDANis 1993-8.0-1.0  
 the total number of earthquakes since 2150 B.C. in SRI LANKAis 1  
 the date of the largest earthquake ever happened in SRI LANKAis 1882-1.0-nan  
 the total number of earthquakes since 2150 B.C. in SPAINis 27  
 the date of the largest earthquake ever happened in SPAINis 1978-8.0-14.0  
 the total number of earthquakes since 2150 B.C. in SOUTH SUDANis 3  
 the date of the largest earthquake ever happened in SOUTH SUDANis 1990-5.0-24.0  
 the total number of earthquakes since 2150 B.C. in SOUTH KOREAis 20  
 the date of the largest earthquake ever happened in SOUTH KOREAis 1936-7.0-3.0  
 the total number of earthquakes since 2150 B.C. in SOUTH GEORGIA AND THE SOUTH SANDWICH ISLANDSis 7  
 the date of the largest earthquake ever happened in SOUTH GEORGIA AND THE SOUTH SANDWICH ISLANDSis 2016-8.0-19.0  
 the total number of earthquakes since 2150 B.C. in SOUTH AFRICAis 14  
 the date of the largest earthquake ever happened in SOUTH AFRICAis 2018-5.0-3.0  
 the total number of earthquakes since 2150 B.C. in SOLOMON SEAis 2  
 the date of the largest earthquake ever happened in SOLOMON SEAis 1972-8.0-17.0  
 the total number of earthquakes since 2150 B.C. in SOLOMON ISLANDSis 61  
 the date of the largest earthquake ever happened in SOLOMON ISLANDSis 1987-6.0-18.0  
 the total number of earthquakes since 2150 B.C. in SLOVENIAis 22  
 the date of the largest earthquake ever happened in SLOVENIAis 1956-1.0-31.0  
 the total number of earthquakes since 2150 B.C. in SLOVAKIAis 3  
 the date of the largest earthquake ever happened in SLOVAKIAis 2004-1.0-10.0  
 the total number of earthquakes since 2150 B.C. in SIERRA LEONEis 1  
 the date of the largest earthquake ever happened in SIERRA LEONEis 1795-5.0-20.0  
 the total number of earthquakes since 2150 B.C. in SERBIAis 15  
 the date of the largest earthquake ever happened in SERBIAis 2015-3.0-8.0  
 the total number of earthquakes since 2150 B.C. in SAUDI ARABIAis 3  
 the date of the largest earthquake ever happened in SAUDI ARABIAis 2004-6.0-9.0  
 the total number of earthquakes since 2150 B.C. in SAMOAis 8  
 the date of the largest earthquake ever happened in SAMOAis 2006-9.0-28.0  
 the total number of earthquakes since 2150 B.C. in SAINT VINCENT AND THE GRENADINESis 1  
 the date of the largest earthquake ever happened in SAINT VINCENT AND THE GRENADINESis 1844-8.0-30.0  
 the total number of earthquakes since 2150 B.C. in SAINT LUCIAis 2  
 the date of the largest earthquake ever happened in SAINT LUCIAis 1788-10.0-12.0  
 the total number of earthquakes since 2150 B.C. in RWANDAis 5  
 the date of the largest earthquake ever happened in RWANDAis 2002-1.0-17.0  
 the total number of earthquakes since 2150 B.C. in RUSSIAis 150

the date of the largest earthquake ever happened in RUSSIAis 1999-2.0-1.0  
the total number of earthquakes since 2150 B.C. in ROMANIAis 15  
the date of the largest earthquake ever happened in ROMANIAis 1977-11.0-3.0  
the total number of earthquakes since 2150 B.C. in PORTUGALis 26  
the date of the largest earthquake ever happened in PORTUGALis 1909-4.0-23.0  
the total number of earthquakes since 2150 B.C. in POLANDis 6  
the date of the largest earthquake ever happened in POLANDis 2019-7.0-1.0  
the total number of earthquakes since 2150 B.C. in PHILIPPINESis 221  
the date of the largest earthquake ever happened in PHILIPPINESis 2004-5.0-19.0  
the total number of earthquakes since 2150 B.C. in PERUis 185  
the date of the largest earthquake ever happened in PERUis 1999-10.0-31.0  
the total number of earthquakes since 2150 B.C. in PAPUA NEW GUINEAis 98  
the date of the largest earthquake ever happened in PAPUA NEW GUINEAis 1988-9.0-6.0  
the total number of earthquakes since 2150 B.C. in PANAMAis 23  
the date of the largest earthquake ever happened in PANAMAis 2006-5.0-4.0  
the total number of earthquakes since 2150 B.C. in PALAUis 1  
the date of the largest earthquake ever happened in PALAUis 1914-10.0-23.0  
the total number of earthquakes since 2150 B.C. in PAKISTANis 53  
the date of the largest earthquake ever happened in PAKISTANis 1981-12.0-12.0  
the total number of earthquakes since 2150 B.C. in PACIFIC OCEANis 2  
the date of the largest earthquake ever happened in PACIFIC OCEANis 1958-11.0-4.0  
the total number of earthquakes since 2150 B.C. in NORWAYis 1  
the date of the largest earthquake ever happened in NORWAYis 1819-8.0-31.0  
the total number of earthquakes since 2150 B.C. in NORTH KOREAis 6  
the date of the largest earthquake ever happened in NORTH KOREAis 1036-7.0-nan  
the total number of earthquakes since 2150 B.C. in NICARAGUAis 39  
the date of the largest earthquake ever happened in NICARAGUAis 2009-3.0-31.0  
the total number of earthquakes since 2150 B.C. in NEW ZEALANDis 71  
the date of the largest earthquake ever happened in NEW ZEALANDis 2010-12.0-25.0  
the total number of earthquakes since 2150 B.C. in NEW CALEDONIAis 21  
the date of the largest earthquake ever happened in NEW CALEDONIAis 2017-11.0-19.0  
the total number of earthquakes since 2150 B.C. in NETHERLANDSis 3  
the date of the largest earthquake ever happened in NETHERLANDSis 2019-5.0-22.0  
the total number of earthquakes since 2150 B.C. in NEPALis 16  
the date of the largest earthquake ever happened in NEPALis 2017-6.0-21.0  
the total number of earthquakes since 2150 B.C. in MYANMAR (BURMA)is 33  
the date of the largest earthquake ever happened in MYANMAR (BURMA)is 2008-12.0-25.0  
the total number of earthquakes since 2150 B.C. in MOZAMBIQUEis 3  
the date of the largest earthquake ever happened in MOZAMBIQUEis 2017-6.0-24.0  
the total number of earthquakes since 2150 B.C. in MOROCCOis 20  
the date of the largest earthquake ever happened in MOROCCOis 1960-2.0-29.0  
the total number of earthquakes since 2150 B.C. in MONTSERRATis 1  
the date of the largest earthquake ever happened in MONTSERRATis 1897-4.0-25.0  
the total number of earthquakes since 2150 B.C. in MONTENEGROis 9

the date of the largest earthquake ever happened in MONTENEGRO is 2018-1.0-4.0

the total number of earthquakes since 2150 B.C. in MONGOLIA is 6

the date of the largest earthquake ever happened in MONGOLIA is 1974-7.0-4.0

the total number of earthquakes since 2150 B.C. in MICRONESIA, FED. STATES OF is 4

the date of the largest earthquake ever happened in MICRONESIA, FED. STATES OF is 1912-10.0-31.0

the total number of earthquakes since 2150 B.C. in MEXICO is 204

the date of the largest earthquake ever happened in MEXICO is 1982-3.0-28.0

the total number of earthquakes since 2150 B.C. in MARTINIQUE is 10

the date of the largest earthquake ever happened in MARTINIQUE is 2007-11.0-29.0

the total number of earthquakes since 2150 B.C. in MALAYSIA is 3

the date of the largest earthquake ever happened in MALAYSIA is 1991-5.0-26.0

the total number of earthquakes since 2150 B.C. in MALAWI is 4

the date of the largest earthquake ever happened in MALAWI is 2006-6.0-3.0

the total number of earthquakes since 2150 B.C. in MADAGASCAR is 1

the date of the largest earthquake ever happened in MADAGASCAR is 2017-1.0-11.0

the total number of earthquakes since 2150 B.C. in MACEDONIA is 12

the date of the largest earthquake ever happened in MACEDONIA is 1983-2.0-25.0

the total number of earthquakes since 2150 B.C. in LIBYA is 1

the date of the largest earthquake ever happened in LIBYA is 1963-2.0-21.0

the total number of earthquakes since 2150 B.C. in LEBANON is 14

the date of the largest earthquake ever happened in LEBANON is 2008-2.0-15.0

the total number of earthquakes since 2150 B.C. in LAOS is 2

the date of the largest earthquake ever happened in LAOS is 2001-2.0-19.0

the total number of earthquakes since 2150 B.C. in KYRGYZSTAN is 14

the date of the largest earthquake ever happened in KYRGYZSTAN is 1990-12.0-1.0

the total number of earthquakes since 2150 B.C. in KIRIBATI is 1

the date of the largest earthquake ever happened in KIRIBATI is 1905-6.0-30.0

the total number of earthquakes since 2150 B.C. in KERMADEC ISLANDS (NEW ZEALAND) is 17

the date of the largest earthquake ever happened in KERMADEC ISLANDS (NEW ZEALAND) is 1993-6.0-18.0

the total number of earthquakes since 2150 B.C. in KENYA is 3

the date of the largest earthquake ever happened in KENYA is 1968-3.0-20.0

the total number of earthquakes since 2150 B.C. in KAZAKHSTAN is 10

the date of the largest earthquake ever happened in KAZAKHSTAN is 1990-9.0-27.0

the total number of earthquakes since 2150 B.C. in JORDAN is 5

the date of the largest earthquake ever happened in JORDAN is 2004-2.0-11.0

the total number of earthquakes since 2150 B.C. in JAPAN is 409

the date of the largest earthquake ever happened in JAPAN is 2007-4.0-15.0

the total number of earthquakes since 2150 B.C. in JAMAICA is 19

the date of the largest earthquake ever happened in JAMAICA is 1988-11.0-12.0

the total number of earthquakes since 2150 B.C. in ITALY is 326

the date of the largest earthquake ever happened in ITALY is 1703-7.0-2.0

the total number of earthquakes since 2150 B.C. in ISRAELis 23  
the date of the largest earthquake ever happened in ISRAELis 1903-3.0-29.0  
the total number of earthquakes since 2150 B.C. in IRELANDis 1  
the date of the largest earthquake ever happened in IRELANDis 1490-nan-nan  
the total number of earthquakes since 2150 B.C. in IRAQis 24  
the date of the largest earthquake ever happened in IRAQis 1991-7.0-24.0  
the total number of earthquakes since 2150 B.C. in IRANis 380  
the date of the largest earthquake ever happened in IRANis 2017-12.0-26.0  
the total number of earthquakes since 2150 B.C. in INDONESIAis 401  
the date of the largest earthquake ever happened in INDONESIAis 1992-2.0-4.0  
the total number of earthquakes since 2150 B.C. in INDIAN OCEANis 3  
the date of the largest earthquake ever happened in INDIAN OCEANis 2003-7.0-15.0  
the total number of earthquakes since 2150 B.C. in INDIAis 99  
the date of the largest earthquake ever happened in INDIAis 2011-10.0-29.0  
the total number of earthquakes since 2150 B.C. in ICELANDis 17  
the date of the largest earthquake ever happened in ICELANDis 1929-7.0-23.0  
the total number of earthquakes since 2150 B.C. in HUNGARYis 5  
the date of the largest earthquake ever happened in HUNGARYis 2006-12.0-31.0  
the total number of earthquakes since 2150 B.C. in HONDURASis 13  
the date of the largest earthquake ever happened in HONDURASis 1982-9.0-29.0  
the total number of earthquakes since 2150 B.C. in HAITIis 17  
the date of the largest earthquake ever happened in HAITIis 1994-3.0-2.0  
the total number of earthquakes since 2150 B.C. in GUINEAis 1  
the date of the largest earthquake ever happened in GUINEAis 1983-12.0-22.0  
the total number of earthquakes since 2150 B.C. in GUATEMALAis 38  
the date of the largest earthquake ever happened in GUATEMALAis 1985-10.0-11.0  
the total number of earthquakes since 2150 B.C. in GUADELOUPEis 9  
the date of the largest earthquake ever happened in GUADELOUPEis 2005-2.0-14.0  
the total number of earthquakes since 2150 B.C. in GRENADAis 1  
the date of the largest earthquake ever happened in GRENADAis 1822-12.0-1.0  
the total number of earthquakes since 2150 B.C. in GREECEis 269  
the date of the largest earthquake ever happened in GREECEis 1980-7.0-12.0  
the total number of earthquakes since 2150 B.C. in GHANAis 5  
the date of the largest earthquake ever happened in GHANAis 1872-4.0-14.0  
the total number of earthquakes since 2150 B.C. in GERMANYis 9  
the date of the largest earthquake ever happened in GERMANYis 2014-5.0-17.0  
the total number of earthquakes since 2150 B.C. in GEORGIAis 15  
the date of the largest earthquake ever happened in GEORGIAis 1811-1.0-1.0  
the total number of earthquakes since 2150 B.C. in GABONis 1  
the date of the largest earthquake ever happened in GABONis 1974-9.0-23.0  
the total number of earthquakes since 2150 B.C. in FRENCH POLYNESIAis 1  
the date of the largest earthquake ever happened in FRENCH POLYNESIAis 1848-7.0-12.0  
the total number of earthquakes since 2150 B.C. in FRENCH GUIANAis 2  
the date of the largest earthquake ever happened in FRENCH GUIANAis 1885-8.0-4.0

the total number of earthquakes since 2150 B.C. in FRANCE is 43  
the date of the largest earthquake ever happened in FRANCE is 1991-2.0-13.0  
the total number of earthquakes since 2150 B.C. in FIJI is 19  
the date of the largest earthquake ever happened in FIJI is 1975-12.0-16.0  
the total number of earthquakes since 2150 B.C. in ETHIOPIA is 9  
the date of the largest earthquake ever happened in ETHIOPIA is 2010-12.0-16.0  
the total number of earthquakes since 2150 B.C. in ERITREA is 6  
the date of the largest earthquake ever happened in ERITREA is 1921-8.0-14.0  
the total number of earthquakes since 2150 B.C. in EL SALVADOR is 38  
the date of the largest earthquake ever happened in EL SALVADOR is 2015-8.0-9.0  
the total number of earthquakes since 2150 B.C. in EGYPT is 15  
the date of the largest earthquake ever happened in EGYPT is 2002-8.0-24.0  
the total number of earthquakes since 2150 B.C. in ECUADOR is 64  
the date of the largest earthquake ever happened in ECUADOR is 2011-10.0-29.0  
the total number of earthquakes since 2150 B.C. in DOMINICAN REPUBLIC is 18  
the date of the largest earthquake ever happened in DOMINICAN REPUBLIC is 2003-10.0-16.0  
the total number of earthquakes since 2150 B.C. in DJIBOUTI is 1  
the date of the largest earthquake ever happened in DJIBOUTI is 1989-8.0-20.0  
the total number of earthquakes since 2150 B.C. in CZECH REPUBLIC is 1  
the date of the largest earthquake ever happened in CZECH REPUBLIC is 2008-11.0-22.0  
the total number of earthquakes since 2150 B.C. in CYPRUS is 6  
the date of the largest earthquake ever happened in CYPRUS is 1995-2.0-23.0  
the total number of earthquakes since 2150 B.C. in CUBA is 14  
the date of the largest earthquake ever happened in CUBA is 1932-2.0-3.0  
the total number of earthquakes since 2150 B.C. in CROATIA is 49  
the date of the largest earthquake ever happened in CROATIA is 1738-3.0-30.0  
the total number of earthquakes since 2150 B.C. in COTE D'IVOIRE is 2  
the date of the largest earthquake ever happened in COTE D'IVOIRE is 1889-nan-nan  
the total number of earthquakes since 2150 B.C. in COSTA RICA is 35  
the date of the largest earthquake ever happened in COSTA RICA is 1990-6.0-8.0  
the total number of earthquakes since 2150 B.C. in CONGO is 7  
the date of the largest earthquake ever happened in CONGO is 2021-6.0-10.0  
the total number of earthquakes since 2150 B.C. in COMOROS is 1  
the date of the largest earthquake ever happened in COMOROS is 2018-5.0-15.0  
the total number of earthquakes since 2150 B.C. in COLOMBIA is 79  
the date of the largest earthquake ever happened in COLOMBIA is 1845-2.0-19.0  
the total number of earthquakes since 2150 B.C. in CHINA is 610  
the date of the largest earthquake ever happened in CHINA is 2009-8.0-8.0  
the total number of earthquakes since 2150 B.C. in CHILE is 198  
the date of the largest earthquake ever happened in CHILE is 1986-12.0-19.0  
the total number of earthquakes since 2150 B.C. in CENTRAL AFRICAN REPUBLIC is 1  
the date of the largest earthquake ever happened in CENTRAL AFRICAN REPUBLIC is 1921-9.0-16.0



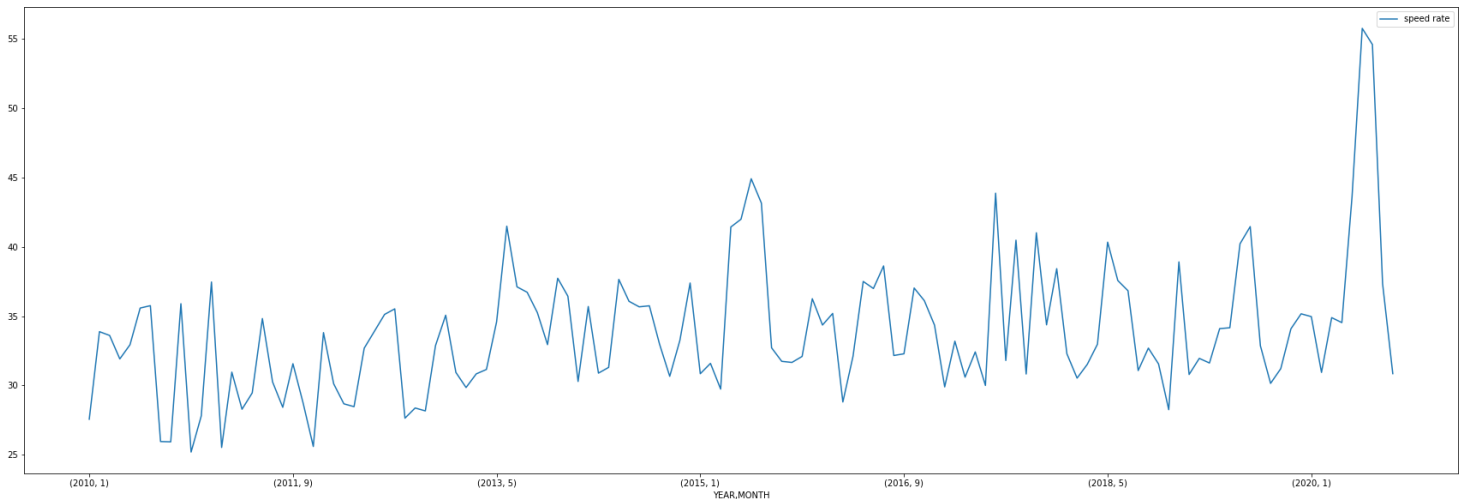
the total number of earthquakes since 2150 B.C. in CANARY ISLANDS is 2  
the date of the largest earthquake ever happened in CANARY ISLANDS is 1800-nan-nan  
the total number of earthquakes since 2150 B.C. in CANADA is 20  
the date of the largest earthquake ever happened in CANADA is 1982-1.0-11.0  
the total number of earthquakes since 2150 B.C. in CAMEROON is 2  
the date of the largest earthquake ever happened in CAMEROON is 1945-9.0-12.0  
the total number of earthquakes since 2150 B.C. in BURUNDI is 1  
the date of the largest earthquake ever happened in BURUNDI is 2004-2.0-24.0  
the total number of earthquakes since 2150 B.C. in BULGARIA is 18  
the date of the largest earthquake ever happened in BULGARIA is 2003-12.0-17.0  
the total number of earthquakes since 2150 B.C. in BRITISH VIRGIN ISLANDS is 1  
the date of the largest earthquake ever happened in BRITISH VIRGIN ISLANDS is 1871-9.0-nan  
the total number of earthquakes since 2150 B.C. in BRAZIL is 6  
the date of the largest earthquake ever happened in BRAZIL is 2012-5.0-19.0  
the total number of earthquakes since 2150 B.C. in BOSNIA-HERZEGOVINA is 10  
the date of the largest earthquake ever happened in BOSNIA-HERZEGOVINA is 2015-2.0-21.0  
the total number of earthquakes since 2150 B.C. in BOLIVIA is 6  
the date of the largest earthquake ever happened in BOLIVIA is 1998-5.0-22.0  
the total number of earthquakes since 2150 B.C. in BHUTAN is 5  
the date of the largest earthquake ever happened in BHUTAN is 2009-12.0-31.0  
the total number of earthquakes since 2150 B.C. in BERING SEA is 1  
the date of the largest earthquake ever happened in BERING SEA is 1991-2.0-21.0  
the total number of earthquakes since 2150 B.C. in BELGIUM is 1  
the date of the largest earthquake ever happened in BELGIUM is 1983-11.0-8.0  
the total number of earthquakes since 2150 B.C. in BARBADOS is 1  
the date of the largest earthquake ever happened in BARBADOS is 1831-8.0-11.0  
the total number of earthquakes since 2150 B.C. in BANGLADESH is 17  
the date of the largest earthquake ever happened in BANGLADESH is 1999-7.0-22.0  
the total number of earthquakes since 2150 B.C. in AZORES (PORTUGAL) is 27  
the date of the largest earthquake ever happened in AZORES (PORTUGAL) is 1964-2.0-18.0  
the total number of earthquakes since 2150 B.C. in AZERBAIJAN is 16  
the date of the largest earthquake ever happened in AZERBAIJAN is 1842-1.0-2.0  
the total number of earthquakes since 2150 B.C. in AUSTRIA is 7  
the date of the largest earthquake ever happened in AUSTRIA is 1998-4.0-12.0  
the total number of earthquakes since 2150 B.C. in AUSTRALIA is 24  
the date of the largest earthquake ever happened in AUSTRALIA is 2009-9.0-22.0  
the total number of earthquakes since 2150 B.C. in ATLANTIC OCEAN is 6  
the date of the largest earthquake ever happened in ATLANTIC OCEAN is 2008-8.0-26.0  
the total number of earthquakes since 2150 B.C. in ARMENIA is 13  
the date of the largest earthquake ever happened in ARMENIA is 856-1.0-nan  
the total number of earthquakes since 2150 B.C. in ARGENTINA is 21  
the date of the largest earthquake ever happened in ARGENTINA is 2008-12.0-10.0

the total number of earthquakes since 2150 B.C. in ANTIGUA AND BARBUDA is 3  
the date of the largest earthquake ever happened in ANTIGUA AND BARBUDA is 1974-10.0-8.0  
the total number of earthquakes since 2150 B.C. in ANTARCTICA is 5  
the date of the largest earthquake ever happened in ANTARCTICA is 2021-1.0-23.0  
the total number of earthquakes since 2150 B.C. in ALGERIA is 57  
the date of the largest earthquake ever happened in ALGERIA is 1987-1.0-26.0  
the total number of earthquakes since 2150 B.C. in ALBANIA is 56  
the date of the largest earthquake ever happened in ALBANIA is 2007-4.0-16.0  
the total number of earthquakes since 2150 B.C. in AFGHANISTAN is 59  
the date of the largest earthquake ever happened in AFGHANISTAN is 1991-4.0-20.0

2.

第二题的原始数据非常复杂，excel 中有很多用不到的数据，需要对于数据进行筛分挑选删除的操作，首先根据用户手册找到有关风速的内容（因为里面还有别的数据），然后将数据进行分列，并进行 groupby 的筛选，并要根据数据的分级进行二次筛选，将等级不为 1 的结果删除掉，还要将里面 9999 的数据筛选出来，删除掉无用数据，最后计算出月度关系。

```
import pandas as pd
wind_speed = pd.read_csv('2281305.csv') #读取文件
wind_speed.head()
speed = wind_speed['WND'].str.split(',',expand=True) #找到风速有关数据，进行分列
wind_speed[['angle','angle quality','type','speed rate','speed quality']] = speed
#将分好的作为新的 column
res = wind_speed['DATE'].str.split('-',expand=True) #时间分列
wind_speed[['YEAR','MONTH','DAY']] = res
wind_speed.head(10)
newset=wind_speed[['speed rate','YEAR','MONTH','speed quality']] #只选取风速，时间
等数据作为新的 set
newset.head(10)
newset = newset.astype('int') #转化为 int 数据
newset = newset[~newset['speed rate'].isin([9999])] #数据存在大量 9999 的缺失数据，
需要筛选出来并删除
newset = newset[newset['speed quality'].isin([1])] #根据用户手册可知，speed quality
为 1 的时候数据可信，其他可信度较低，所以此处删除不为 1 的数据
newset = newset.drop(columns=['speed quality'])
newset.groupby(['YEAR','MONTH']).mean('speed rate').plot(figsize=(30,10)) #plot 结果
```



过去十年间深圳的风速变化不明显，但是有一个轻微的在上升到趋势，特别是在深圳夏秋季节，台风天气多的时候，风速增加到的更加明显。

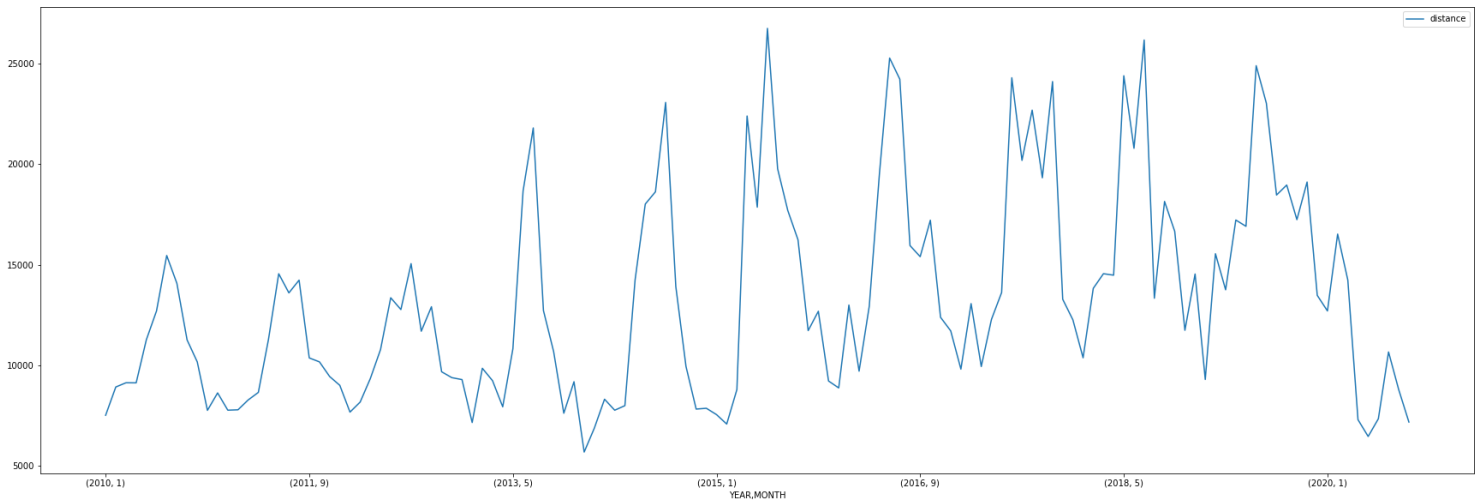
3.

第三题我选择了深圳过去十年间宝安机场能见度的分析，代码如下：

```
import pandas as pd
import matplotlib.pyplot as plt
data = pd.read_csv('2281305.csv') #读取数据
data.head()
VIS = data['VIS'].str.split(',',expand=True) #将所用数据分列
data[['distance','distance quality','variability','quality variability']] = VIS #
分列后的数据导入新的列
res = data['DATE'].str.split('-',expand=True)
data[['YEAR','MONTH','DAY']] = res
data.head(10)
VIS=data[['distance','YEAR','MONTH','distance quality']] #选出所用到的数据
VIS.head(10)
VIS = VIS.astype('int') #转换类型
VIS = VIS[~VIS['distance'].isin([999999])] #去掉所缺失数据
VIS = VIS[VIS['distance quality'].isin([1])] #能见度数据分级，如果不是1级代表数据可
信度低，在此进行筛选
VIS = VIS.drop(columns=['distance quality'])
VIS.groupby(['YEAR','MONTH']).mean('distance').plot(figsize=(30,10)) #将能见度按照
年月聚类计算，看变化趋势
VIS.groupby(['YEAR','MONTH']).min('distance').plot.bar(figsize=(50,20)) #plot 出能
能见度最小值，与风速关系进行对比
VIS.groupby(['YEAR','MONTH']).max('distance').plot.bar(figsize=(50,20)) #plot 出能
能见度最大值，与风速关系进行对比
VIS.describe() #计算出能见度的标准差
VIS.loc[(VIS['distance']<5000)].count() #人为的进行分类，将能见度小于5000定位视野
差，5000-15000为视野一般，大于15000为视野极好，计算对应天数
VIS.loc[(VIS['distance']>15000)].count()
VIS.loc[(VIS['distance']<15000)&(VIS['distance']>5000)].count()
```

### 3.1

数据处理思路见第二题，计算了能见度与时间的关系，可以看出随着时间的增加，机场能见度在逐年增加，而且夏季的能见度明显比冬季要好。



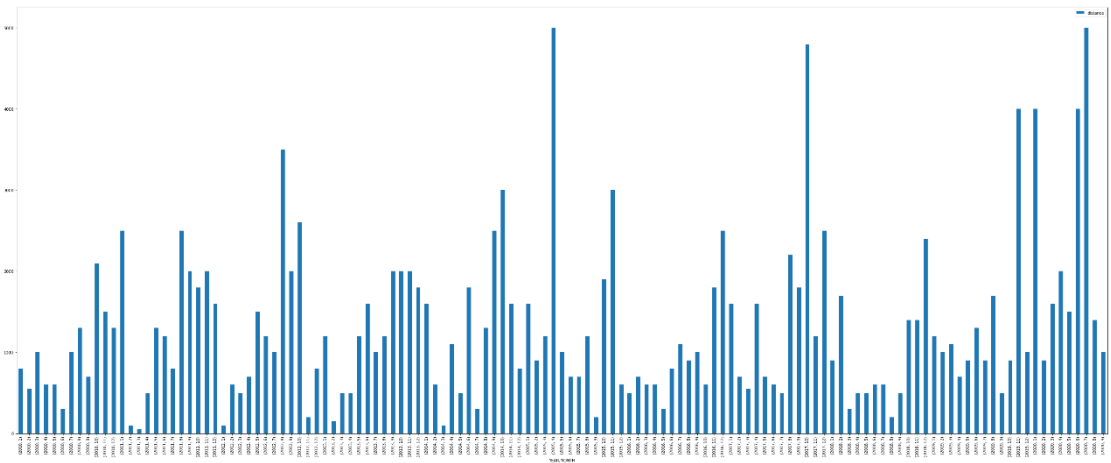
进一步进行分析，将能见度进行分级，把小于 5000 的记为能见度差，5000-15000 的正常能见度，大于 15000 的为能见度好，并且计算了对应的天数。得到能见度差为 9097 天，正常为 61672 天，好为 15951 天。

```
Out[18]:
distance    9097
YEAR        9097
MONTH       9097
dtype: int64

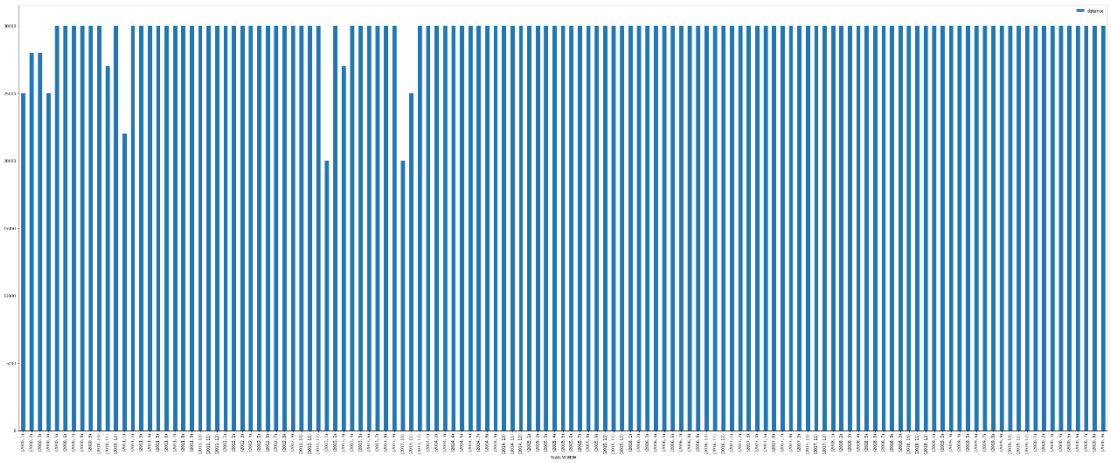
In [19]: VIS.loc[(VIS['distance']>15000)].count()
Out[19]:
distance    15951
YEAR        15951
MONTH       15951
dtype: int64

In [20]: VIS.loc[(VIS['distance']<15000)&(VIS['distance']>5000)].count()
Out[20]:
distance    61672
YEAR        61672
MONTH       61672
dtype: int64
```

计算了每月的能见度最小值



计算了每月能见度的最大值



将能见度与第二题中的风速结合到一起，发现风速大的时候能见度相对比较好，而风速过大的时候，降雨增多，使得能见度变差。

