# Working on Real Project with Python (A part of Big Data Analysis)

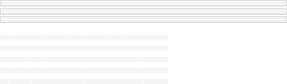


The Weather Dataset

Here, The Weather Dataset is a time-series data set with per-hour information about the weather conditions at a particular location. It records Temperature, Dew Point Temperature, Relative Humidity, Wind Speed, Visibility, Pressure, and Conditions.

This data is available as a CSV file. We are going to analyze this data set using the Pandas DataFrame.

In [29]:



**import** pandas **as** pd

data **=** pd**.**read\_csv(r"C:\Users\91999\Desktop\Youtube Video\DSL\Videos\7. Real Python Big Data Analysis Project\Weather Data.csv") data

**Date/Time Temp\_C Dew Point Temp\_C Rel Hum\_% Wind Speed\_km/h Visibility\_km Press\_kPa Weather**

0 1/1/2012 0:00 -1.8

1 1/1/2012 1:00 -1.8

2 1/1/2012 2:00 -1.8

3 1/1/2012 3:00 -1.5

4 1/1/2012 4:00 -1.5

... ... ...

8779 12/31/2012 19:00 0.1

8780 12/31/2012 20:00 0.2

8781 12/31/2012 21:00 -0.5

8782 12/31/2012 22:00 -0.2

-3.9 86

-3.7 87

-3.4 89

-3.2 88

-3.3 88

... ...

-2.7 81

-2.4 83

-1.5 93

-1.8 89

4 8.0 101.24 Fog

4 8.0 101.24 Fog

7 4.0 101.26 Freezing Drizzle,Fog

6 4.0 101.27 Freezing Drizzle,Fog

7 4.8 101.23

... ... ...

30 9.7 100.13

24 9.7 100.03

28 4.8 99.95

28 9.7 99.91

Fog

...

Snow Snow Snow Snow

In [30]:

In [31]:

Out[31]:

8783 12/31/2012 23:00 0.0 -2.1 86 30 11.3 99.89 Snow

8784 rows × 8 columns

# How to Analyze DataFrames ?

.head()

It shows the first N rows in the data (by default, N=5).

In [32]:



data**.**head()

**Date/Time Temp\_C Dew Point Temp\_C Rel Hum\_% Wind Speed\_km/h Visibility\_km Press\_kPa Weather**

0 1/1/2012 0:00 -1.8

1 1/1/2012 1:00 -1.8

2 1/1/2012 2:00 -1.8

3 1/1/2012 3:00 -1.5

-3.9 86

-3.7 87

-3.4 89

-3.2 88

4 8.0 101.24 Fog

4 8.0 101.24 Fog

7 4.0 101.26 Freezing Drizzle,Fog

6 4.0 101.27 Freezing Drizzle,Fog

Out[32]:

4 1/1/2012 4:00 -1.5 -3.3 88 7 4.8 101.23 Fog

# .shape

It shows the total no. of rows and no. of columns of the dataframe



data**.**shape

In [33]:

Out[33]: (8784, 8)

# .index

This attribute provides the index of the dataframe



data**.**index

In [35]:

Out[35]: RangeIndex(start=0, stop=8784, step=1)

# .columns

It shows the name of each column



data**.**columns

In [36]:

Out[36]: Index(['Date/Time', 'Temp\_C', 'Dew Point Temp\_C', 'Rel Hum\_%', 'Wind Speed\_km/h', 'Visibility\_km', 'Press\_kPa', 'Weather'],

dtype='object')

# .dtypes

It shows the data-type of each column



data**.**dtypes

In [37]:

Out[37]: Date/Time object

Temp\_C float64

Dew Point Temp\_C float64 Rel Hum\_% int64

Wind Speed\_km/h int64

Visibility\_km float64

Press\_kPa float64

Weather object

dtype: object

# .unique()

In a column, it shows all the unique values. It can be applied on a single column only, not on the whole dataframe.



data['Weather']**.**unique()

In [38]:

Out[38]: array(['Fog', 'Freezing Drizzle,Fog', 'Mostly Cloudy', 'Cloudy', 'Rain', 'Rain Showers', 'Mainly Clear', 'Snow Showers', 'Snow', 'Clear',

'Freezing Rain,Fog', 'Freezing Rain', 'Freezing Drizzle', 'Rain,Snow', 'Moderate Snow', 'Freezing Drizzle,Snow',

'Freezing Rain,Snow Grains', 'Snow,Blowing Snow', 'Freezing Fog', 'Haze', 'Rain,Fog', 'Drizzle,Fog', 'Drizzle',

'Freezing Drizzle,Haze', 'Freezing Rain,Haze', 'Snow,Haze', 'Snow,Fog', 'Snow,Ice Pellets', 'Rain,Haze', 'Thunderstorms,Rain', 'Thunderstorms,Rain Showers', 'Thunderstorms,Heavy Rain Showers', 'Thunderstorms,Rain Showers,Fog', 'Thunderstorms', 'Thunderstorms,Rain,Fog',

'Thunderstorms,Moderate Rain Showers,Fog', 'Rain Showers,Fog', 'Rain Showers,Snow Showers', 'Snow Pellets', 'Rain,Snow,Fog', 'Moderate Rain,Fog', 'Freezing Rain,Ice Pellets,Fog', 'Drizzle,Ice Pellets,Fog', 'Drizzle,Snow', 'Rain,Ice Pellets', 'Drizzle,Snow,Fog', 'Rain,Snow Grains', 'Rain,Snow,Ice Pellets', 'Snow Showers,Fog', 'Moderate Snow,Blowing Snow'], dtype=object)

# .nunique()

It shows the total no. of unique values in each column. It can be applied on a single column as well as on whole dataframe.



data**.**nunique()

In [39]:

Out[39]: Date/Time 8784

Temp\_C 533

Dew Point Temp\_C 489

Rel Hum\_% 83

Wind Speed\_km/h 34

Visibility\_km 24

Press\_kPa 518

Weather 50

dtype: int64

# .count

It shows the total no. of non-null values in each column. It can be applied on a single column as well as on whole dataframe.



data**.**count()

In [40]:

Out[40]: Date/Time 8784

Temp\_C 8784

Dew Point Temp\_C 8784

Rel Hum\_% 8784

Wind Speed\_km/h 8784

Visibility\_km 8784

Press\_kPa 8784

Weather 8784

dtype: int64

# .value\_counts

In a column, it shows all the unique values with their count. It can be applied on single column only.



data['Weather']**.**value\_counts()

In [41]:

Out[41]: Mainly Clear 2106

Mostly Cloudy 2069

Cloudy 1728

Clear 1326

Snow 390

Rain 306

Rain Showers 188

Fog 150

Rain,Fog 116

Drizzle,Fog 80

Snow Showers 60

Drizzle 41

Snow,Fog 37

Snow,Blowing Snow 19

Rain,Snow 18

Thunderstorms,Rain Showers 16

Haze 16

Drizzle,Snow,Fog 15

Freezing Rain 14

Freezing Drizzle,Snow 11

Freezing Drizzle 7

Snow,Ice Pellets 6

Freezing Drizzle,Fog 6

Snow,Haze 5

Snow Showers,Fog 4

Freezing Fog 4

Rain,Snow,Ice Pellets 4

Moderate Snow 4

Freezing Rain,Fog 4

Rain,Haze 3

Thunderstorms,Rain Showers,Fog 3

Freezing Drizzle,Haze 3

Thunderstorms,Rain 3

Drizzle,Snow 2

Freezing Rain,Haze 2

Rain Showers,Snow Showers 2

Thunderstorms 2

Moderate Snow,Blowing Snow 2

Rain Showers,Fog 1

Thunderstorms,Heavy Rain Showers 1

Rain,Snow,Fog 1

Freezing Rain,Ice Pellets,Fog 1

Moderate Rain,Fog 1

Snow Pellets 1

Rain,Snow Grains 1

Rain,Ice Pellets 1

Freezing Rain,Snow Grains 1

Drizzle,Ice Pellets,Fog 1

Thunderstorms,Rain,Fog 1

Thunderstorms,Moderate Rain Showers,Fog 1

Name: Weather, dtype: int64

# .info()

Provides basic information about the dataframe.



data**.**info()

In [42]:

<class 'pandas.core.frame.DataFrame'> RangeIndex: 8784 entries, 0 to 8783 Data columns (total 8 columns):

Date/Time 8784 non-null object

Temp\_C 8784 non-null float64 Dew Point Temp\_C 8784 non-null float64 Rel Hum\_% 8784 non-null int64 Wind Speed\_km/h 8784 non-null int64 Visibility\_km 8784 non-null float64 Press\_kPa 8784 non-null float64

Weather 8784 non-null object dtypes: float64(4), int64(2), object(2) memory usage: 549.1+ KB



# Q) 1. Find all the unique 'Wind Speed' values in the data.

In [49]:



data**.**head(2)

**Date/Time Temp\_C Dew Point Temp\_C Rel Hum\_% Wind Speed\_km/h Visibility\_km Press\_kPa Weather**

0 1/1/2012 0:00 -1.8 -3.9 86 4 8.0 101.24 Fog

1 1/1/2012 1:00 -1.8 -3.7 87 4 8.0 101.24 Fog

data**.**nunique()

Out[49]:

In [50]:

Out[50]: Date/Time 8784

Temp\_C 533

Dew Point Temp\_C 489

Rel Hum\_% 83

Wind Speed\_km/h 34

Visibility\_km 24

Press\_kPa 518

Weather 50

dtype: int64

In [51]:



data['Wind Speed\_km/h']**.**nunique() 34

data['Wind Speed\_km/h']**.**unique() *# Answer*

Out[51]:

In [52]:

Out[52]: array([ 4, 7, 6, 9, 15, 13, 20, 22, 19, 24, 30, 35, 39, 32, 33, 26, 44,

43, 48, 37, 28, 17, 11, 0, 83, 70, 57, 46, 41, 52, 50, 63, 54, 2],

dtype=int64)

# Q) 2. Find the number of times when the 'Weather is exactly Clear'.

In [53]:



data**.**head(2)

**Date/Time Temp\_C Dew Point Temp\_C Rel Hum\_% Wind Speed\_km/h Visibility\_km Press\_kPa Weather**

0 1/1/2012 0:00 -1.8 -3.9 86 4 8.0 101.24 Fog

1 1/1/2012 1:00 -1.8 -3.7 87 4 8.0 101.24 Fog

*# value\_counts()*

data**.**Weather**.**value\_counts()

Out[53]:

In [54]:

Out[54]: Mainly Clear 2106

Mostly Cloudy 2069

Cloudy 1728

Clear 1326

Snow 390

Rain 306

Rain Showers 188

Fog 150

Rain,Fog 116

Drizzle,Fog 80

Snow Showers 60

Drizzle 41

Snow,Fog 37

Snow,Blowing Snow 19

Rain,Snow 18

Thunderstorms,Rain Showers 16

Haze 16

Drizzle,Snow,Fog 15

Freezing Rain 14

Freezing Drizzle,Snow 11

Freezing Drizzle 7

Snow,Ice Pellets 6

Freezing Drizzle,Fog 6

Snow,Haze 5

Snow Showers,Fog 4

Freezing Fog 4

Rain,Snow,Ice Pellets 4

Moderate Snow 4

Freezing Rain,Fog 4

Rain,Haze 3

Thunderstorms,Rain Showers,Fog 3

Freezing Drizzle,Haze 3

Thunderstorms,Rain 3

Drizzle,Snow 2

Freezing Rain,Haze 2

Rain Showers,Snow Showers 2

Thunderstorms 2

Moderate Snow,Blowing Snow 2

Rain Showers,Fog 1

Thunderstorms,Heavy Rain Showers 1

Rain,Snow,Fog 1

Freezing Rain,Ice Pellets,Fog 1

Moderate Rain,Fog 1

Snow Pellets 1

Rain,Snow Grains 1

Rain,Ice Pellets 1

Freezing Rain,Snow Grains 1

Drizzle,Ice Pellets,Fog 1

Thunderstorms,Rain,Fog 1

Thunderstorms,Moderate Rain Showers,Fog 1

Name: Weather, dtype: int64

In [57]:

*# Filtering*

*#data.head(2)*

data[data**.**Weather **==** 'Clear']

## Out[57]: Date/Time Temp\_C Dew Point Temp\_C Rel Hum\_% Wind Speed\_km/h Visibility\_km Press\_kPa Weather



67 1/3/2012 19:00 -16.9

114 1/5/2012 18:00 -7.1

115 1/5/2012 19:00 -9.2

116 1/5/2012 20:00 -9.8

117 1/5/2012 21:00 -9.0

... ... ...

8646 12/26/2012 6:00 -13.4

8698 12/28/2012 10:00 -6.1

-24.8 50

-14.4 56

-15.4 61

-15.7 62

-14.8 63

... ...

-14.8 89

-8.6 82

24 25.0 101.74 Clear

11 25.0 100.71 Clear

7 25.0 100.80 Clear

9 25.0 100.83 Clear

13 25.0 100.83 Clear

... ... ... ...

4 25.0 102.47 Clear

19 24.1 101.27 Clear

8713 12/29/2012 1:00 -11.9

-13.6 87

11 25.0 101.31 Clear

8714 12/29/2012 2:00 -11.8

-13.1 90

13 25.0 101.33 Clear

8756 12/30/2012 20:00 -13.8 -16.5 80 24 25.0 101.52 Clear

1326 rows × 8 columns

In [59]:

*# groupby()*

*#data.head(2)*

data**.**groupby('Weather')**.**get\_group('Clear')

## Out[59]: Date/Time Temp\_C Dew Point Temp\_C Rel Hum\_% Wind Speed\_km/h Visibility\_km Press\_kPa Weather



67 1/3/2012 19:00 -16.9

114 1/5/2012 18:00 -7.1

115 1/5/2012 19:00 -9.2

116 1/5/2012 20:00 -9.8

117 1/5/2012 21:00 -9.0

... ... ...

8646 12/26/2012 6:00 -13.4

8698 12/28/2012 10:00 -6.1

8713 12/29/2012 1:00 -11.9

8714 12/29/2012 2:00 -11.8

-24.8 50

-14.4 56

-15.4 61

-15.7 62

-14.8 63

... ...

-14.8 89

-8.6 82

-13.6 87

-13.1 90

24 25.0 101.74 Clear

11 25.0 100.71 Clear

7 25.0 100.80 Clear

9 25.0 100.83 Clear

13 25.0 100.83 Clear

... ... ... ...

4 25.0 102.47 Clear

19 24.1 101.27 Clear

11 25.0 101.31 Clear

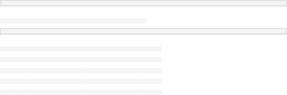
13 25.0 101.33 Clear

8756 12/30/2012 20:00 -13.8 -16.5 80 24 25.0 101.52 Clear

1326 rows × 8 columns

# Q) 3. Find the number of times when the 'Wind Speed was exactly 4 km/h'.

In [60]:



data**.**head(2)

**Date/Time Temp\_C Dew Point Temp\_C Rel Hum\_% Wind Speed\_km/h Visibility\_km Press\_kPa Weather**

0 1/1/2012 0:00 -1.8 -3.9 86 4 8.0 101.24 Fog

1 1/1/2012 1:00 -1.8 -3.7 87 4 8.0 101.24 Fog

data[data['Wind Speed\_km/h'] **==** 4] *# Answer*

**Date/Time Temp\_C Dew Point Temp\_C Rel Hum\_% Wind Speed\_km/h Visibility\_km Press\_kPa Weather**

0 1/1/2012 0:00 -1.8

-3.9 86

4 8.0 101.24 Fog

1 1/1/2012 1:00 -1.8

96 1/5/2012 0:00 -8.8

101 1/5/2012 5:00 -7.0

146 1/7/2012 2:00 -8.1

... ... ...

8768 12/31/2012 8:00 -8.6

8769 12/31/2012 9:00 -8.1

8770 12/31/2012 10:00 -7.4

8772 12/31/2012 12:00 -5.8

-3.7 87

-11.7 79

-9.5 82

-11.1 79

... ...

-10.3 87

-9.6 89

-8.9 89

-7.5 88

4 8.0 101.24 Fog

4 9.7 100.32 Snow

4 4.0 100.19 Snow

4 19.3 100.15 Cloudy

... ... ... ...

4 3.2 101.14 Snow Showers

4 2.4 101.09 Snow

4 6.4 101.05 Snow,Fog

4 12.9 100.78 Snow

Out[60]:

In [63]:

Out[63]:

8773 12/31/2012 13:00 -4.6 -6.6 86 4 12.9 100.63 Snow

474 rows × 8 columns

# Q. 4) Find out all the Null Values in the data.



data**.**isnull()**.**sum()

In [65]:

Out[65]: Date/Time 0

Temp\_C 0

Dew Point Temp\_C 0

Rel Hum\_% 0

Wind Speed\_km/h 0

Visibility\_km 0

Press\_kPa 0

Weather 0

dtype: int64



data**.**notnull()**.**sum()

In [66]:

Out[66]: Date/Time 8784

Temp\_C 8784

Dew Point Temp\_C 8784

Rel Hum\_% 8784

Wind Speed\_km/h 8784

Visibility\_km 8784

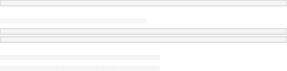
Press\_kPa 8784

Weather 8784

dtype: int64

# Q. 5) Rename the column name 'Weather' of the dataframe to 'Weather Condition'.

In [67]:



data**.**head(2)

**Date/Time Temp\_C Dew Point Temp\_C Rel Hum\_% Wind Speed\_km/h Visibility\_km Press\_kPa Weather**

0 1/1/2012 0:00 -1.8 -3.9 86 4 8.0 101.24 Fog

1 1/1/2012 1:00 -1.8 -3.7 87 4 8.0 101.24 Fog

data**.**rename(columns **=** {'Weather' : 'Weather Condition'}, inplace **= True**)

data**.**head()

**Date/Time Temp\_C Dew Point Temp\_C Rel Hum\_% Wind Speed\_km/h Visibility\_km Press\_kPa Weather Condition**

0 1/1/2012 0:00 -1.8

1 1/1/2012 1:00 -1.8

2 1/1/2012 2:00 -1.8

3 1/1/2012 3:00 -1.5

-3.9 86

-3.7 87

-3.4 89

-3.2 88

4 8.0 101.24 Fog

4 8.0 101.24 Fog

7 4.0 101.26 Freezing Drizzle,Fog

6 4.0 101.27 Freezing Drizzle,Fog

Out[67]:

In [70]:

In [71]:

Out[71]:

4 1/1/2012 4:00 -1.5 -3.3 88 7 4.8 101.23 Fog

# Q.6) What is the mean 'Visibility' ?

In [72]:



data**.**head(2)

**Date/Time Temp\_C Dew Point Temp\_C Rel Hum\_% Wind Speed\_km/h Visibility\_km Press\_kPa Weather Condition**

0 1/1/2012 0:00 -1.8 -3.9 86 4 8.0 101.24 Fog

1 1/1/2012 1:00 -1.8 -3.7 87 4 8.0 101.24 Fog

data**.**Visibility\_km**.**mean()

Out[72]:

In [73]:

Out[73]: 27.66444672131151

# Q. 7) What is the Standard Deviation of 'Pressure' in this data?



data**.**Press\_kPa**.**std()

In [74]:

Out[74]: 0.8440047459486474

# Q. 8) Whats is the Variance of 'Relative Humidity' in this data ?



data['Rel Hum\_%']**.**var()

In [75]:

Out[75]: 286.2485501984998

# Q. 9) Find all instances when 'Snow' was recorded.

In [79]:

*# value\_counts() #data.head(2)*

data['Weather Condition']**.**value\_counts()

Out[79]: Mainly Clear 2106

Mostly Cloudy 2069

Cloudy 1728

Clear 1326

Snow 390

Rain 306

Rain Showers 188

Fog 150

Rain,Fog 116

Drizzle,Fog 80

Snow Showers 60

Drizzle 41

Snow,Fog 37

Snow,Blowing Snow 19

Rain,Snow 18

Thunderstorms,Rain Showers 16

Haze 16

Drizzle,Snow,Fog 15

Freezing Rain 14

Freezing Drizzle,Snow 11

Freezing Drizzle 7

Snow,Ice Pellets 6

Freezing Drizzle,Fog 6

Snow,Haze 5

Snow Showers,Fog 4

Freezing Fog 4

Rain,Snow,Ice Pellets 4

Moderate Snow 4

Freezing Rain,Fog 4

Rain,Haze 3

Thunderstorms,Rain Showers,Fog 3

Freezing Drizzle,Haze 3

Thunderstorms,Rain 3

Drizzle,Snow 2

Freezing Rain,Haze 2

Rain Showers,Snow Showers 2

Thunderstorms 2

Moderate Snow,Blowing Snow 2

Rain Showers,Fog 1

Thunderstorms,Heavy Rain Showers 1

Rain,Snow,Fog 1

Freezing Rain,Ice Pellets,Fog 1

Moderate Rain,Fog 1

Snow Pellets 1

Rain,Snow Grains 1

Rain,Ice Pellets 1

Freezing Rain,Snow Grains 1

Drizzle,Ice Pellets,Fog 1

Thunderstorms,Rain,Fog 1

Thunderstorms,Moderate Rain Showers,Fog 1

Name: Weather Condition, dtype: int64

In [80]:



*#Filtering*

data[data['Weather Condition'] **==** 'Snow']

**Date/Time Temp\_C Dew Point Temp\_C Rel Hum\_% Wind Speed\_km/h Visibility\_km Press\_kPa Weather Condition**

55 1/3/2012 7:00 -14.0

-19.5 63

19 25.0 100.95

Snow

84 1/4/2012 12:00 -13.7

86 1/4/2012 14:00 -11.3

87 1/4/2012 15:00 -10.2

88 1/4/2012 16:00 -9.4

... ... ...

8779 12/31/2012 19:00 0.1

8780 12/31/2012 20:00 0.2

8781 12/31/2012 21:00 -0.5

8782 12/31/2012 22:00 -0.2

-21.7 51

-19.0 53

-16.3 61

-15.5 61

... ...

-2.7 81

-2.4 83

-1.5 93

-1.8 89

11 24.1 101.25

7 19.3 100.97

11 9.7 100.89

13 19.3 100.79

... ... ...

30 9.7 100.13

24 9.7 100.03

28 4.8 99.95

28 9.7 99.91

Snow Snow Snow Snow

...

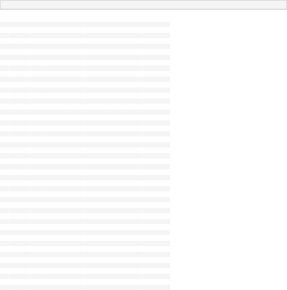
Snow Snow Snow Snow

Out[80]:

8783 12/31/2012 23:00 0.0 -2.1 86 30 11.3 99.89 Snow

390 rows × 8 columns

In [87]:



*# str.contains*

data[data['Weather Condition']**.**str**.**contains('Snow')]**.**tail(50)

**Date/Time Temp\_C Dew Point Temp\_C Rel Hum\_% Wind Speed\_km/h Visibility\_km Press\_kPa Weather Condition**

8680 12/27/2012 16:00 -4.5

8681 12/27/2012 17:00 -4.2

8682 12/27/2012 18:00 -4.0

8683 12/27/2012 19:00 -3.9

8684 12/27/2012 20:00 -3.7

8685 12/27/2012 21:00 -3.7

8686 12/27/2012 22:00 -3.8

8687 12/27/2012 23:00 -4.0

8688 12/28/2012 0:00 -4.2

8689 12/28/2012 1:00 -4.4

8690 12/28/2012 2:00 -4.3

8691 12/28/2012 3:00 -4.6

8692 12/28/2012 4:00 -4.9

8723 12/29/2012 11:00 -10.9

-6.2 88

-5.9 88

-5.7 88

-5.6 88

-5.3 89

-4.8 92

-4.6 94

-5.6 89

-5.7 89

-6.6 85

-6.3 86

-5.9 91

-5.9 93

-12.2 90

37 2.0 100.44 Snow,Blowing Snow

32 3.2 100.47 Snow,Blowing Snow

28 8.0 100.49 Snow,Blowing Snow

26 9.7 100.52 Snow,Blowing Snow

37 16.1 100.58 Snow

24 4.8 100.62 Freezing Drizzle,Snow

20 4.8 100.65 Freezing Drizzle,Snow

24 9.7 100.70 Snow

19 8.0 100.78 Freezing Drizzle,Snow

15 6.4 100.83 Freezing Drizzle,Snow

11 12.9 100.93 Freezing Drizzle,Snow

13 4.0 101.01 Snow

9 9.7 101.00 Snow

7 6.4 101.09 Snow Showers,Fog

8724 12/29/2012 12:00 -10.5

-11.6 92

11 8.0 100.93 Snow Showers,Fog

8725 12/29/2012 13:00 -10.0

-11.1 92

22 9.7 100.63 Snow Showers,Fog

8726 12/29/2012 14:00 -9.3

8727 12/29/2012 15:00 -8.8

8728 12/29/2012 16:00 -8.5

8729 12/29/2012 17:00 -9.0

8730 12/29/2012 18:00 -9.3

8731 12/29/2012 19:00 -9.5

8732 12/29/2012 20:00 -9.7

8733 12/29/2012 21:00 -9.8

8734 12/29/2012 22:00 -10.1

8735 12/29/2012 23:00 -10.0

8736 12/30/2012 0:00 -9.6

8737 12/30/2012 1:00 -9.4

8738 12/30/2012 2:00 -9.3

8739 12/30/2012 3:00 -9.1

8740 12/30/2012 4:00 -9.3

8741 12/30/2012 5:00 -9.1

8742 12/30/2012 6:00 -9.3

8767 12/31/2012 7:00 -9.3

8768 12/31/2012 8:00 -8.6

-10.5 91

-10.0 91

-9.9 90

-10.4 90

-10.9 88

-11.2 87

-11.6 86

-11.8 85

-11.6 89

-12.0 85

-11.3 87

-10.5 92

-10.4 92

-10.4 90

-10.6 90

-10.4 90

-10.8 89

-11.3 85

-10.3 87

22 4.8 100.60 Snow,Fog

20 1.2 100.55 Snow,Fog

24 1.2 100.49 Snow,Fog

19 2.4 100.46 Snow,Fog

26 6.4 100.38 Snow,Fog

26 3.2 100.33 Snow,Fog

24 9.7 100.25 Snow,Fog

24 8.0 100.24 Snow,Fog

15 2.4 100.20 Snow,Fog

20 6.4 100.19 Snow,Fog

13 3.2 100.23 Snow,Fog

9 2.4 100.22 Snow,Fog

9 4.0 100.28 Snow,Fog

11 3.6 100.30 Snow,Fog

13 9.7 100.28 Snow,Fog

11 4.0 100.32 Snow,Fog

17 8.0 100.39 Snow,Fog

0 19.3 101.19 Snow Showers

4 3.2 101.14 Snow Showers

8769 12/31/2012 9:00 -8.1

-9.6 89

4 2.4 101.09 Snow

8770 12/31/2012 10:00 -7.4

-8.9 89

4 6.4 101.05 Snow,Fog

8771 12/31/2012 11:00 -6.7

8772 12/31/2012 12:00 -5.8

8773 12/31/2012 13:00 -4.6

8774 12/31/2012 14:00 -3.4

8775 12/31/2012 15:00 -2.3

8776 12/31/2012 16:00 -1.4

8777 12/31/2012 17:00 -1.1

8778 12/31/2012 18:00 -1.3

8779 12/31/2012 19:00 0.1

8780 12/31/2012 20:00 0.2

8781 12/31/2012 21:00 -0.5

8782 12/31/2012 22:00 -0.2

8783 12/31/2012 23:00 0.0

-7.9 91

-7.5 88

-6.6 86

-5.7 84

-4.6 84

-4.0 82

-3.3 85

-3.1 88

-2.7 81

-2.4 83

-1.5 93

-1.8 89

-2.1 86

9 9.7 100.93

4 12.9 100.78

4 12.9 100.63

6 11.3 100.57

9 9.7 100.47

13 12.9 100.40

19 9.7 100.30

17 9.7 100.19

30 9.7 100.13

24 9.7 100.03

28 4.8 99.95

28 9.7 99.91

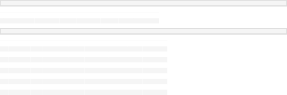
30 11.3 99.89

Snow Snow Snow Snow Snow Snow Snow Snow Snow Snow Snow Snow Snow

Out[87]:

# Q. 10) Find all instances when 'Wind Speed is above 24' and 'Visibility is 25'.

In [88]:



data**.**head(2)

**Date/Time Temp\_C Dew Point Temp\_C Rel Hum\_% Wind Speed\_km/h Visibility\_km Press\_kPa Weather Condition**

0 1/1/2012 0:00 -1.8 -3.9 86 4 8.0 101.24 Fog

1 1/1/2012 1:00 -1.8 -3.7 87 4 8.0 101.24 Fog

data[(data['Wind Speed\_km/h'] **>** 24) **&** (data['Visibility\_km'] **==** 25)]

**Date/Time Temp\_C Dew Point Temp\_C Rel Hum\_% Wind Speed\_km/h Visibility\_km Press\_kPa Weather Condition**

23 1/1/2012 23:00 5.3

24 1/2/2012 0:00 5.2

25 1/2/2012 1:00 4.6

26 1/2/2012 2:00 3.9

27 1/2/2012 3:00 3.7

... ... ...

8705 12/28/2012 17:00 -8.6

8753 12/30/2012 17:00 -12.1

8755 12/30/2012 19:00 -13.4

8759 12/30/2012 23:00 -12.1

2.0 79

1.5 77

0.0 72

-0.9 71

-1.5 69

... ...

-12.0 76

-15.8 74

-16.5 77

-15.1 78

30 25.0 99.31 Cloudy

35 25.0 99.26 Rain Showers

39 25.0 99.26 Cloudy

1. 25.0 99.26 Mostly Cloudy
2. 25.0 99.30 Mostly Cloudy

... ... ... ...

26 25.0 101.34 Mainly Clear

28 25.0 101.26 Mainly Clear

26 25.0 101.47 Mainly Clear

28 25.0 101.52 Mostly Cloudy

Out[88]:

In [89]:

Out[89]:

8760 12/31/2012 0:00 -11.1 -14.4 77 26 25.0 101.51 Cloudy

308 rows × 8 columns

# Q. 11) What is the Mean value of each column against each 'Weather Conditon' ?

In [90]:



data**.**head(2)

**Date/Time Temp\_C Dew Point Temp\_C Rel Hum\_% Wind Speed\_km/h Visibility\_km Press\_kPa Weather Condition**

0 1/1/2012 0:00 -1.8 -3.9 86 4 8.0 101.24 Fog

1 1/1/2012 1:00 -1.8 -3.7 87 4 8.0 101.24 Fog

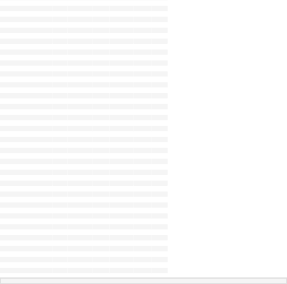
data**.**groupby('Weather Condition')**.**mean()

Out[90]:

In [91]:

Out[91]:

## Weather Condition



Clear 6.825716 0.089367 64.497738 10.557315 30.153243 101.587443

Cloudy 7.970544 2.375810 69.592593 16.127315 26.625752 100.911441

Drizzle 7.353659 5.504878 88.243902 16.097561 17.931707 100.435366

Drizzle,Fog 8.067500 7.033750 93.275000 11.862500 5.257500 100.786625

Drizzle,Ice Pellets,Fog 0.400000 -0.700000 92.000000 20.000000 4.000000 100.790000

Drizzle,Snow 1.050000 0.150000 93.500000 14.000000 10.500000 100.890000

Drizzle,Snow,Fog 0.693333 0.120000 95.866667 15.533333 5.513333 99.281333

Fog 4.303333 3.159333 92.286667 7.946667 6.248000 101.184067

Freezing Drizzle -5.657143 -8.000000 83.571429 16.571429 9.200000 100.202857

Freezing Drizzle,Fog -2.533333 -4.183333 88.500000 17.000000 5.266667 100.441667

Freezing Drizzle,Haze -5.433333 -8.000000 82.000000 10.333333 2.666667 100.316667

Freezing Drizzle,Snow -5.109091 -7.072727 86.090909 16.272727 5.872727 100.520909

Freezing Fog -7.575000 -9.250000 87.750000 4.750000 0.650000 102.320000

Freezing Rain -3.885714 -6.078571 84.642857 19.214286 8.242857 99.647143

Freezing Rain,Fog -2.225000 -3.750000 89.500000 15.500000 7.550000 99.945000

Freezing Rain,Haze -4.900000 -7.450000 82.500000 7.500000 2.400000 100.375000

Freezing Rain,Ice Pellets,Fog -2.600000 -3.700000 92.000000 28.000000 8.000000 100.950000

Freezing Rain,Snow Grains -5.000000 -7.300000 84.000000 32.000000 4.800000 98.560000

Haze -0.200000 -2.975000 81.625000 10.437500 7.831250 101.482500

Mainly Clear 12.558927 4.581671 60.667142 14.144824 34.264862 101.248832

Moderate Rain,Fog 1.700000 0.800000 94.000000 17.000000 6.400000 99.980000

Moderate Snow -5.525000 -7.250000 87.750000 33.750000 0.750000 100.275000

Moderate Snow,Blowing Snow -5.450000 -6.500000 92.500000 40.000000 0.600000 100.570000

Mostly Cloudy 10.574287 3.131174 62.102465 15.813920 31.253842 101.025288

Rain 9.786275 7.042810 83.624183 19.254902 18.856536 100.233333

Rain Showers 13.722340 9.187766 75.159574 17.132979 22.816489 100.404043

Rain Showers,Fog 12.800000 12.100000 96.000000 13.000000 6.400000 99.830000

Rain Showers,Snow Showers 2.150000 -1.500000 76.500000 22.500000 21.700000 101.100000

Rain,Fog 8.273276 7.219828 93.189655 14.793103 6.873276 100.500862

Rain,Haze 4.633333 2.066667 83.333333 11.666667 6.700000 100.540000

Rain,Ice Pellets 0.600000 -0.600000 92.000000 24.000000 9.700000 100.120000

Rain,Snow 1.055556 -0.566667 89.000000 28.388889 11.672222 99.951111

Rain,Snow Grains 1.900000 -2.100000 75.000000 26.000000 25.000000 100.600000

Rain,Snow,Fog 0.800000 0.300000 96.000000 9.000000 6.400000 100.730000

Rain,Snow,Ice Pellets 1.100000 -0.175000 91.500000 23.250000 6.000000 100.105000

Snow -4.524103 -7.623333 79.307692 20.038462 11.171795 100.536103

Snow Pellets 0.700000 -6.400000 59.000000 35.000000 2.400000 99.700000

Snow Showers -3.506667 -7.866667 72.350000 19.233333 20.158333 100.963500

Snow Showers,Fog -10.675000 -11.900000 90.750000 13.750000 7.025000 101.292500

Snow,Blowing Snow -5.410526 -7.621053 84.473684 34.842105 4.105263 99.704737

Snow,Fog -5.075676 -6.364865 90.675676 17.324324 4.537838 100.688649

Snow,Haze -4.020000 -6.860000 80.600000 5.000000 4.640000 100.782000

Snow,Ice Pellets -1.883333 -3.666667 87.666667 23.833333 7.416667 100.548333

Thunderstorms 24.150000 19.750000 77.000000 7.500000 24.550000 100.230000

Thunderstorms,Heavy Rain Showers 10.900000 9.000000 88.000000 9.000000 2.400000 100.260000

Thunderstorms,Moderate Rain Showers,Fog 19.600000 18.500000 93.000000 15.000000 3.200000 100.010000

Thunderstorms,Rain 20.433333 18.533333 89.000000 15.666667 19.833333 100.420000

Thunderstorms,Rain Showers 20.037500 17.618750 86.375000 18.312500 15.893750 100.233750

Thunderstorms,Rain Showers,Fog 21.600000 18.700000 84.000000 19.666667 9.700000 100.063333

Thunderstorms,Rain,Fog 20.600000 18.600000 88.000000 19.000000 4.800000 100.080000

**Temp\_C Dew Point Temp\_C Rel Hum\_% Wind Speed\_km/h Visibility\_km Press\_kPa**

In [ ]:

# Q. 12) What is the Minimum & Maximum value of each column against each 'Weather Conditon' ?

In [92]:



data**.**head(2)

**Date/Time Temp\_C Dew Point Temp\_C Rel Hum\_% Wind Speed\_km/h Visibility\_km Press\_kPa Weather Condition**

0 1/1/2012 0:00 -1.8 -3.9 86 4 8.0 101.24 Fog

1 1/1/2012 1:00 -1.8 -3.7 87 4 8.0 101.24 Fog

data**.**groupby('Weather Condition')**.**min()

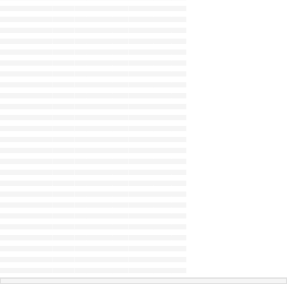
Out[92]:

In [93]:

Out[93]:

In [94]:

## Weather Condition



Clear 1/11/2012 1:00 -23.3

Cloudy 1/1/2012 17:00 -21.4

Drizzle 1/23/2012 21:00 1.1

Drizzle,Fog 1/23/2012 20:00 0.0

Drizzle,Ice Pellets,Fog 12/17/2012 9:00 0.4

Drizzle,Snow 12/17/2012 15:00 0.9

Drizzle,Snow,Fog 12/18/2012 21:00 0.3

Fog 1/1/2012 0:00 -16.0

Freezing Drizzle 1/13/2012 10:00 -9.0

Freezing Drizzle,Fog 1/1/2012 2:00 -6.4

Freezing Drizzle,Haze 2/1/2012 11:00 -5.8

Freezing Drizzle,Snow 1/13/2012 3:00 -8.3

Freezing Fog 1/22/2012 6:00 -19.0

Freezing Rain 1/13/2012 11:00 -6.5

-28.5 20

-26.8 18

-0.2 74

-1.6 85

-0.7 92

0.1 92

-0.1 92

-17.2 80

-12.2 78

-9.0 82

-8.3 81

-10.4 79

-22.9 71

-9.0 81

0 11.3 99.52

0 11.3 98.39

0 6.4 97.84

0 1.0 98.65

20 4.0 100.79

9 9.7 100.63

7 2.4 97.79

0 0.2 98.31

6 4.8 98.44

6 3.6 98.74

9 2.0 100.28

6 2.4 99.19

0 0.2 101.97

7 2.8 98.22

Freezing Rain,Fog 1/17/2012 23:00 -6.1

-8.7 82

7 2.8 98.32

Freezing Rain,Haze 2/1/2012 14:00 -4.9

-7.5 82

6 2.0 100.34

Freezing Rain,Ice Pellets,Fog 12/17/2012 3:00 -2.6

Freezing Rain,Snow Grains 1/13/2012 9:00 -5.0

Haze 1/22/2012 12:00 -11.5

Mainly Clear 1/10/2012 11:00 -22.8

Moderate Rain,Fog 12/10/2012 8:00 1.7

Moderate Snow 1/12/2012 15:00 -6.3

Moderate Snow,Blowing Snow 12/27/2012 10:00 -5.5

Mostly Cloudy 1/1/2012 16:00 -23.2

Rain 1/1/2012 18:00 0.3

Rain Showers 1/1/2012 22:00 1.6

Rain Showers,Fog 10/20/2012 3:00 12.8

Rain Showers,Snow Showers 11/4/2012 8:00 2.1

Rain,Fog 1/23/2012 18:00 0.0

Rain,Haze 3/13/2012 7:00 4.0

Rain,Ice Pellets 12/18/2012 5:00 0.6

Rain,Snow 1/10/2012 5:00 0.6

Rain,Snow Grains 12/21/2012 0:00 1.9

Rain,Snow,Fog 12/8/2012 21:00 0.8

Rain,Snow,Ice Pellets 12/21/2012 1:00 0.9

-3.7 92

-7.3 84

-16.0 68

-28.0 20

0.8 94

-7.6 83

-6.6 92

-28.5 18

-5.7 40

-7.2 37

12.1 96

-1.8 75

-1.2 83

1.0 81

-0.6 92

-1.7 81

-2.1 75

0.3 96

-0.7 88

28 8.0 100.95

32 4.8 98.56

0 4.8 100.35

0 12.9 98.67

17 6.4 99.98

26 0.6 99.88

39 0.6 100.50

0 11.3 98.36

0 4.0 97.52

0 6.4 98.51

13 6.4 99.83

17 19.3 101.09

0 2.0 98.61

7 4.0 100.50

24 9.7 100.12

13 2.4 98.18

26 25.0 100.60

9 6.4 100.73

17 4.8 99.85

Snow 1/10/2012 1:00 -16.7

-24.6 41

0 1.0 97.75

Snow Pellets 11/24/2012 15:00 0.7

Snow Showers 1/12/2012 7:00 -13.3

Snow Showers,Fog 12/26/2012 9:00 -11.3

Snow,Blowing Snow 1/13/2012 21:00 -12.0

Snow,Fog 12/16/2012 15:00 -10.1

Snow,Haze 2/1/2012 17:00 -4.3

Snow,Ice Pellets 12/10/2012 3:00 -4.3

Thunderstorms 7/16/2012 1:00 21.6

Thunderstorms,Heavy Rain Showers 5/29/2012 6:00 10.9

Thunderstorms,Moderate Rain Showers,Fog 7/17/2012 6:00 19.6

Thunderstorms,Rain 5/25/2012 20:00 19.4

Thunderstorms,Rain Showers 5/29/2012 16:00 11.0

Thunderstorms,Rain Showers,Fog 6/29/2012 3:00 19.5

Thunderstorms,Rain,Fog 7/17/2012 5:00 20.6

-6.4 59

-19.3 52

-12.7 89

-16.2 70

-12.0 77

-7.2 80

-5.9 76

19.4 67

9.0 88

18.5 93

18.2 83

7.0 68

16.1 80

18.6 88

35 2.4 99.70

0 2.4 99.49

7 4.0 100.63

24 0.6 98.11

4 1.2 99.38

0 4.0 100.61

19 2.8 99.40

0 24.1 99.84

9 2.4 100.26

15 3.2 100.01

4 16.1 100.19

7 6.4 99.65

7 9.7 99.71

19 4.8 100.08

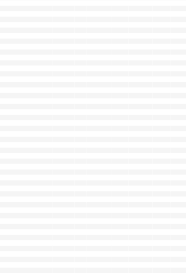
data**.**groupby('Weather Condition')**.**max()

**Date/Time Temp\_C Dew Point Temp\_C Rel Hum\_% Wind Speed\_km/h Visibility\_km Press\_kPa**

Out[94]:

## Weather Condition

**Date/Time Temp\_C Dew Point Temp\_C Rel Hum\_% Wind Speed\_km/h Visibility\_km Press\_kPa**



Clear 9/9/2012 5:00 32.8

Cloudy 9/9/2012 23:00 30.5

Drizzle 9/30/2012 3:00 18.8

Drizzle,Fog 9/30/2012 2:00 19.9

Drizzle,Ice Pellets,Fog 12/17/2012 9:00 0.4

Drizzle,Snow 12/19/2012 18:00 1.2

Drizzle,Snow,Fog 12/22/2012 3:00 1.1

Fog 9/22/2012 0:00 20.8

Freezing Drizzle 2/1/2012 5:00 -2.3

Freezing Drizzle,Fog 12/10/2012 5:00 -0.3

Freezing Drizzle,Haze 2/1/2012 13:00 -5.0

Freezing Drizzle,Snow 3/2/2012 12:00 -3.3

Freezing Fog 3/17/2012 6:00 -0.1

Freezing Rain 2/1/2012 7:00 0.3

20.4 99

22.6 99

17.7 96

19.1 100

-0.7 92

0.2 95

0.6 98

19.6 100

-3.3 93

-2.3 94

-7.7 83

-4.6 94

-0.3 99

-1.7 92

33 48.3 103.63

54 48.3 103.65

30 25.0 101.56

28 9.7 102.07

20 4.0 100.79

19 11.3 101.15

32 9.7 100.15

22 9.7 103.04

26 12.9 101.02

33 8.0 101.27

11 4.0 100.36

24 12.9 101.18

9 0.8 102.85

28 16.1 101.00

Freezing Rain,Fog 12/17/2012 1:00 0.1

-0.9 93

26 9.7 101.01

Freezing Rain,Haze 2/1/2012 15:00 -4.9

Freezing Rain,Ice Pellets,Fog 12/17/2012 3:00 -2.6

Freezing Rain,Snow Grains 1/13/2012 9:00 -5.0

Haze 3/13/2012 23:00 14.1

Mainly Clear 9/9/2012 9:00 33.0

Moderate Rain,Fog 12/10/2012 8:00 1.7

Moderate Snow 12/27/2012 9:00 -4.9

Moderate Snow,Blowing Snow 12/27/2012 12:00 -5.4

Mostly Cloudy 9/9/2012 2:00 32.4

Rain 9/5/2012 2:00 22.8

Rain Showers 9/8/2012 16:00 26.4

Rain Showers,Fog 10/20/2012 3:00 12.8

Rain Showers,Snow Showers 12/5/2012 10:00 2.2

Rain,Fog 9/30/2012 23:00 21.7

Rain,Haze 3/13/2012 9:00 5.5

Rain,Ice Pellets 12/18/2012 5:00 0.6

Rain,Snow 4/23/2012 3:00 1.7

Rain,Snow Grains 12/21/2012 0:00 1.9

Rain,Snow,Fog 12/8/2012 21:00 0.8

-7.4 83

-3.7 92

-7.3 84

11.1 86

21.2 99

0.8 94

-6.7 93

-6.4 93

24.4 100

20.4 99

23.0 97

12.1 96

-1.2 78

19.5 100

2.9 86

-0.6 92

0.5 94

-2.1 75

0.3 96

9 2.8 100.41

28 8.0 100.95

32 4.8 98.56

17 9.7 102.97

63 48.3 103.59

17 6.4 99.98

39 0.8 100.67

41 0.6 100.64

83 48.3 103.65

52 48.3 102.26

41 48.3 102.31

13 6.4 99.83

28 24.1 101.11

46 9.7 101.77

17 9.7 100.61

24 9.7 100.12

52 25.0 101.07

26 25.0 100.60

9 6.4 100.73

Rain,Snow,Ice Pellets 12/21/2012 5:00 1.3

0.1 94

28 6.4 100.47

Snow 4/27/2012 9:00 3.7

0.3 96

57 25.0 102.73

Snow Pellets 11/24/2012 15:00 0.7

Snow Showers 3/4/2012 21:00 2.9

Snow Showers,Fog 12/29/2012 13:00 -10.0

Snow,Blowing Snow 2/25/2012 9:00 -1.4

Snow,Fog 3/14/2012 19:00 1.1

Snow,Haze 2/1/2012 21:00 -3.6

Snow,Ice Pellets 3/3/2012 4:00 0.8

Thunderstorms 7/4/2012 16:00 26.7

Thunderstorms,Heavy Rain Showers 5/29/2012 6:00 10.9

Thunderstorms,Moderate Rain Showers,Fog 7/17/2012 6:00 19.6

Thunderstorms,Rain 7/23/2012 18:00 21.3

Thunderstorms,Rain Showers 9/8/2012 4:00 25.5

Thunderstorms,Rain Showers,Fog 7/31/2012 20:00 22.9

Thunderstorms,Rain,Fog 7/17/2012 5:00 20.6

-6.4 59

-0.7 94

-11.1 92

-2.9 91

0.8 99

-6.4 81

-1.7 92

20.1 87

9.0 88

18.5 93

19.1 93

23.1 98

21.3 91

18.6 88

35 2.4 99.70

37 48.3 102.50

22 9.7 102.52

48 9.7 100.62

35 9.7 102.07

15 6.4 100.99

33 11.3 100.96

15 25.0 100.62

9 2.4 100.26

15 3.2 100.01

30 24.1 100.83

32 25.0 101.06

35 9.7 100.64

19 4.8 100.08

# Q. 13) Show all the Records where Weather Condition is Fog.

In [95]:



data[data['Weather Condition'] **==** 'Fog']

**Date/Time Temp\_C Dew Point Temp\_C Rel Hum\_% Wind Speed\_km/h Visibility\_km Press\_kPa Weather Condition**

0 1/1/2012 0:00 -1.8

1 1/1/2012 1:00 -1.8

4 1/1/2012 4:00 -1.5

5 1/1/2012 5:00 -1.4

6 1/1/2012 6:00 -1.5

... ... ...

8716 12/29/2012 4:00 -16.0

-3.9 86

-3.7 87

-3.3 88

-3.3 87

-3.1 89

... ...

-17.2 90

4 8.0 101.24

4 8.0 101.24

7 4.8 101.23

9 6.4 101.27

7 6.4 101.29

... ... ...

6 9.7 101.25

Fog Fog Fog Fog Fog

...

Fog

8717 12/29/2012 5:00 -14.8

-15.9 91

4 6.4 101.25

Fog

8718 12/29/2012 6:00 -13.8

-15.3 88

4 9.7 101.25

Fog

8719 12/29/2012 7:00 -14.8

-16.4 88

7 8.0 101.22

Fog

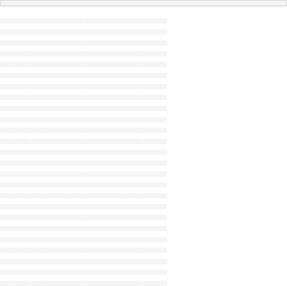
Out[95]:

8722 12/29/2012 10:00 -12.0 -13.3 90 7 6.4 101.15 Fog

150 rows × 8 columns

# Q. 14) Find all instances when 'Weather is Clear' or 'Visibility is above 40'.

In [98]:



data[(data['Weather Condition'] **==** 'Clear') **|** (data['Visibility\_km'] **>** 40)]**.**tail(50)

**Date/Time Temp\_C Dew Point Temp\_C Rel Hum\_% Wind Speed\_km/h Visibility\_km Press\_kPa Weather Condition**

8387 12/15/2012 11:00 -9.3

-14.9 64

19 48.3 102.74 Mainly Clear

8388 12/15/2012 12:00 -9.1

-15.1 62

19 48.3 102.71 Mainly Clear

8389 12/15/2012 13:00 -8.4

8390 12/15/2012 14:00 -8.0

8391 12/15/2012 15:00 -7.8

8392 12/15/2012 16:00 -8.5

8394 12/15/2012 18:00 -9.1

8396 12/15/2012 20:00 -8.7

8408 12/16/2012 8:00 -9.5

8599 12/24/2012 7:00 -11.1

8600 12/24/2012 8:00 -11.0

8601 12/24/2012 9:00 -10.5

8602 12/24/2012 10:00 -9.9

8603 12/24/2012 11:00 -9.0

8604 12/24/2012 12:00 -7.9

8605 12/24/2012 13:00 -7.6

8606 12/24/2012 14:00 -7.8

8607 12/24/2012 15:00 -7.5

8610 12/24/2012 18:00 -10.4

8630 12/25/2012 14:00 -7.7

8631 12/25/2012 15:00 -7.1

-14.7 60

-14.2 61

-13.7 63

-14.8 60

-15.1 62

-15.1 60

-14.8 65

-13.9 80

-13.9 79

-13.7 77

-13.4 76

-13.7 69

-13.3 65

-13.1 65

-13.7 63

-13.3 63

-13.8 76

-14.1 60

-13.7 59

19 48.3 102.64 Clear

13 48.3 102.59 Mainly Clear

15 48.3 102.55 Mainly Clear

20 48.3 102.54 Mainly Clear

17 25.0 102.54 Clear

20 25.0 102.50 Clear

32 48.3 101.85 Cloudy

15 25.0 101.23

13 25.0 101.32

13 24.1 101.41

Clear Clear Clear

11 48.3 101.45 Mainly Clear

11 48.3 101.44 Mainly Clear

9 48.3 101.43 Mainly Clear

15 48.3 101.45 Mainly Clear

15 48.3 101.46 Mainly Clear

13 48.3 101.49 Mainly Clear

9 25.0 101.45 Clear

6 48.3 101.95 Mainly Clear

17 48.3 101.98

Clear

8632 12/25/2012 16:00 -7.5

-13.9 60

11 48.3 102.03

Clear

8633 12/25/2012 17:00 -8.3

8637 12/25/2012 21:00 -9.7

8638 12/25/2012 22:00 -10.9

8639 12/25/2012 23:00 -10.4

8640 12/26/2012 0:00 -11.8

8641 12/26/2012 1:00 -11.2

8642 12/26/2012 2:00 -12.7

8643 12/26/2012 3:00 -14.2

8644 12/26/2012 4:00 -13.1

8645 12/26/2012 5:00 -12.7

8646 12/26/2012 6:00 -13.4

8651 12/26/2012 11:00 -11.3

8652 12/26/2012 12:00 -10.6

8698 12/28/2012 10:00 -6.1

8699 12/28/2012 11:00 -6.2

8700 12/28/2012 12:00 -7.2

8701 12/28/2012 13:00 -6.8

8702 12/28/2012 14:00 -6.5

8703 12/28/2012 15:00 -6.8

-13.4 67

-12.5 80

-13.2 83

-12.7 83

-13.5 87

-12.9 87

-14.4 87

-15.8 88

-14.7 88

-14.1 89

-14.8 89

-14.5 77

-14.3 74

-8.6 82

-8.8 82

-9.9 81

-9.8 79

-9.9 77

-10.3 76

13 25.0 102.10

4 25.0 102.28

4 25.0 102.34

11 25.0 102.45

4 25.0 102.41

6 25.0 102.42

4 25.0 102.45

6 25.0 102.52

6 25.0 102.55

4 25.0 102.48

4 25.0 102.47

Clear Clear Clear Clear Clear Clear Clear Clear Clear Clear Clear

20 48.3 102.50 Mainly Clear

20 48.3 102.36 Mainly Clear

19 24.1 101.27 Clear

24 48.3 101.24 Mainly Clear

24 48.3 101.22 Mainly Clear

20 48.3 101.17 Mainly Clear

22 48.3 101.17 Mainly Clear

24 48.3 101.22 Mainly Clear

8704 12/28/2012 16:00 -7.7

-11.0 77

30 48.3 101.25 Mainly Clear

8713 12/29/2012 1:00 -11.9

-13.6 87

11 25.0 101.31 Clear

8714 12/29/2012 2:00 -11.8

8748 12/30/2012 12:00 -12.2

8749 12/30/2012 13:00 -12.4

8750 12/30/2012 14:00 -11.8

8751 12/30/2012 15:00 -11.3

8752 12/30/2012 16:00 -11.4

-13.1 90

-15.7 75

-16.2 73

-16.1 70

-15.6 70

-15.5 72

13 25.0 101.33 Clear

26 48.3 100.91 Mostly Cloudy

37 48.3 100.92 Mostly Cloudy

37 48.3 100.96 Mainly Clear

32 48.3 101.05 Mainly Clear

26 48.3 101.15 Mainly Clear

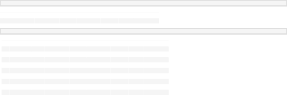
8756 12/30/2012 20:00 -13.8 -16.5 80 24 25.0 101.52 Clear

Out[98]:

# Q. 15) Find all instances when :

1. 'Weather is Clear' and 'Relative Humidity is greater than 50' or
2. 'Visibility is above 40'

In [99]:



data**.**head(2)

**Date/Time Temp\_C Dew Point Temp\_C Rel Hum\_% Wind Speed\_km/h Visibility\_km Press\_kPa Weather Condition**

0 1/1/2012 0:00 -1.8 -3.9 86 4 8.0 101.24 Fog

1 1/1/2012 1:00 -1.8 -3.7 87 4 8.0 101.24 Fog

data[(data['Weather Condition'] **==** 'Clear') **&** (data['Rel Hum\_%'] **>** 50)**|**(data['Visibility\_km'] **>** 40)]

**Date/Time Temp\_C Dew Point Temp\_C Rel Hum\_% Wind Speed\_km/h Visibility\_km Press\_kPa Weather Condition**

106 1/5/2012 10:00 -6.0

107 1/5/2012 11:00 -5.6

108 1/5/2012 12:00 -4.7

109 1/5/2012 13:00 -4.4

110 1/5/2012 14:00 -5.1

... ... ...

8749 12/30/2012 13:00 -12.4

8750 12/30/2012 14:00 -11.8

8751 12/30/2012 15:00 -11.3

8752 12/30/2012 16:00 -11.4

-10.0 73

-10.2 70

-9.6 69

-9.7 66

-10.7 65

... ...

-16.2 73

-16.1 70

-15.6 70

-15.5 72

17 48.3 100.45 Mainly Clear

22 48.3 100.41 Mainly Clear

20 48.3 100.38 Mainly Clear

26 48.3 100.40 Mainly Clear

22 48.3 100.46 Mainly Clear

... ... ... ...

37 48.3 100.92 Mostly Cloudy

37 48.3 100.96 Mainly Clear

32 48.3 101.05 Mainly Clear

26 48.3 101.15 Mainly Clear

Out[99]:

In [101…

Out[101]:

In [ ]:

8756 12/30/2012 20:00 -13.8 -16.5 80 24 25.0 101.52 Clear

2921 rows × 8 columns