

# Working on Real Time Project Using Python

## (A Part of Big Data Analysis)

### The Weather Data Set

Here, The DataSet is a time series Dataset with per hour information about the weather condition at a particular location. It record the **Temperature, Dewpoint, Relative Humidity, Wind Speed, Visibility, Pressure and Conditions.**

Data is available CSV file. We are importing dataset using Pandas DataFrame.

```
In [4]: import pandas as pd
```

```
In [7]: data = pd.read_csv('Weather_Data.csv')
```

```
In [8]: data
```

Out[8]:	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
2	1/1/2012 2:00	-1.8	-3.4	89	7	4.0	101.26	Freezing Drizzle,Fog
3	1/1/2012 3:00	-1.5	-3.2	88	6	4.0	101.27	Freezing Drizzle,Fog
4	1/1/2012 4:00	-1.5	-3.3	88	7	4.8	101.23	Fog
...	...	...	...	...	...	...	...	...
8779	12/31/2012 19:00	0.1	-2.7	81	30	9.7	100.13	Snow
8780	12/31/2012 20:00	0.2	-2.4	83	24	9.7	100.03	Snow
8781	12/31/2012 21:00	-0.5	-1.5	93	28	4.8	99.95	Snow
8782	12/31/2012 22:00	-0.2	-1.8	89	28	9.7	99.91	Snow
8783	12/31/2012 23:00	0.0	-2.1	86	30	11.3	99.89	Snow

8784 rows × 8 columns

## Analyze DataFrame

### .head()

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

```
In [9]: data.head()
```

Out[9]:

	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
2	1/1/2012 2:00	-1.8	-3.4	89	7	4.0	101.26	Freezing Drizzle,Fog
3	1/1/2012 3:00	-1.5	-3.2	88	6	4.0	101.27	Freezing Drizzle,Fog
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

```
In [10]: data.shape
```

Out[10]: (8784, 8)

### .index

This attribute provides the index of the dataframe

```
In [11]: data.index
```

Out[11]: RangeIndex(start=0, stop=8784, step=1)

### .columns

It shows the name of each column.

```
In [13]: data.columns
```

Out[13]: 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

```
In [14]: data.dtypes
```

```
Out[14]: 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.

```
In [16]: data['Weather'].unique()
```

```
Out[16]: 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 the whole dataframe.

```
In [18]: data.nunique()
```

```
Out[18]: 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 the whole dataframe.

```
In [20]: data.count
```

```
Out[20]: <bound method DataFrame.count of
          um_% Wind Speed_km/h \
0      1/1/2012 0:00   -1.8      Date/Time  Temp_C  Dew Point Temp_C Rel H
1      1/1/2012 1:00   -1.8      -3.9       86        4
2      1/1/2012 2:00   -1.8      -3.7       87        4
3      1/1/2012 3:00   -1.5      -3.4       89        7
4      1/1/2012 4:00   -1.5      -3.2       88        6
...
8779 12/31/2012 19:00    0.1      -3.3       88        7
8780 12/31/2012 20:00    0.2      -2.7       81       30
8781 12/31/2012 21:00   -0.5      -2.4       83       24
8782 12/31/2012 22:00   -0.2      -1.5       93       28
8783 12/31/2012 23:00    0.0      -1.8       89       28
                                         ...
                                         Visibility_km  Press_kPa Weather
0                  8.0      101.24     Fog
1                  8.0      101.24     Fog
2                  4.0      101.26  Freezing Drizzle,Fog
3                  4.0      101.27  Freezing Drizzle,Fog
4                  4.8      101.23     Fog
...
8779                ...      ...     ...
8780                9.7      100.13   Snow
8781                9.7      100.03   Snow
8782                4.8      99.95   Snow
8783                9.7      99.91   Snow
                                         11.3      99.89   Snow
                                         ...
                                         [8784 rows x 8 columns]>
```

```
In [21]: data.count()
```

```
Out[21]: 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
```

```
In [23]: data['Rel Hum_%'].count()
```

```
Out[23]: 8784
```

## .value\_counts

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

```
In [25]: data['Wind Speed_km/h'].value_counts
```

```
Out[25]: <bound method IndexOpsMixin.value_counts of 0      4
1      4
2      7
3      6
4      7
..
8779   30
8780   24
8781   28
8782   28
8783   30
Name: Wind Speed_km/h, Length: 8784, dtype: int64>
```

```
In [26]: data['Wind Speed_km/h'].value_counts()
```

```
Out[26]: 9      830
11     791
13     735
15     719
7      677
17     666
19     616
6      609
20     496
4      474
22     439
24     374
0      309
26     242
28     205
30     161
32     139
33     85
35     53
37     45
39     24
41     22
44     14
43     13
48     13
46     11
52      7
57      5
50      4
2      2
83      1
70      1
63      1
54      1
Name: Wind Speed_km/h, dtype: int64
```

## .info()

Provides basic information about the dataframe.

In [27]:

```
data.info()
```

```
<class 'pandas.core.frame.DataFrame'>
RangeIndex: 8784 entries, 0 to 8783
Data columns (total 8 columns):
 #   Column           Non-Null Count  Dtype  
--- 
 0   Date/Time        8784 non-null    object  
 1   Temp_C           8784 non-null    float64 
 2   Dew Point Temp_C 8784 non-null    float64 
 3   Rel Hum_%        8784 non-null    int64   
 4   Wind Speed_km/h 8784 non-null    int64   
 5   Visibility_km    8784 non-null    float64 
 6   Press_kPa         8784 non-null    float64 
 7   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 [28]:

```
data.head(2) #testing to print first 2 rows of the datasheet
```

Out[28]:

	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

In [31]:

```
data.nunique() #total number of unique value in all the columns
```

Out[31]:

```
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 [32]:

```
data['Wind Speed_km/h'].nunique() #total number of unique values in windspeed
```

Out[32]:

```
34
```

In [33]:

```
data['Wind Speed_km/h'].unique() #Answer
```

Out[33]:

```
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 [34]:

```
data['Weather'].value_counts()
#using value_counts(), showing just the number of Weather as Clear.
```

Out[34]:

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
Freezing Fog	4
Snow Showers,Fog	4
Moderate Snow	4
Rain,Snow,Ice Pellets	4
Freezing Rain,Fog	4
Freezing Drizzle,Haze	3
Rain,Haze	3
Thunderstorms,Rain	3
Thunderstorms,Rain Showers,Fog	3
Freezing Rain,Haze	2
Drizzle,Snow	2
Rain Showers,Snow Showers	2
Thunderstorms	2
Moderate Snow,Blowing Snow	2
Rain Showers,Fog	1
Thunderstorms,Moderate Rain Showers,Fog	1
Snow Pellets	1
Rain,Snow,Fog	1
Moderate Rain,Fog	1
Freezing Rain,Ice Pellets,Fog	1
Drizzle,Ice Pellets,Fog	1
Thunderstorms,Rain,Fog	1
Rain,Ice Pellets	1
Rain,Snow Grains	1
Thunderstorms,Heavy Rain Showers	1
Freezing Rain,Snow Grains	1

Name: Weather, dtype: int64

In [37]:

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

#By filtering method, showing all the columns with Weather as Clear.

Out[37]:

	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	-24.8	50	24	25.0	101.74	Clear
114	1/5/2012 18:00	-7.1	-14.4	56	11	25.0	100.71	Clear
115	1/5/2012 19:00	-9.2	-15.4	61	7	25.0	100.80	Clear
116	1/5/2012 20:00	-9.8	-15.7	62	9	25.0	100.83	Clear
117	1/5/2012 21:00	-9.0	-14.8	63	13	25.0	100.83	Clear
...	...	...	...	...	...	...	...	...
8646	12/26/2012 6:00	-13.4	-14.8	89	4	25.0	102.47	Clear
8698	12/28/2012 10:00	-6.1	-8.6	82	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 [38]:

```
data.groupby('Weather').get_group('Clear')
#using group function
```

Out[38]:

	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	-24.8	50	24	25.0	101.74	Clear
114	1/5/2012 18:00	-7.1	-14.4	56	11	25.0	100.71	Clear
115	1/5/2012 19:00	-9.2	-15.4	61	7	25.0	100.80	Clear
116	1/5/2012 20:00	-9.8	-15.7	62	9	25.0	100.83	Clear
117	1/5/2012 21:00	-9.0	-14.8	63	13	25.0	100.83	Clear
...	...	...	...	...	...	...	...	...

	Date/Time	Temp_C	Dew Point Temp_C	Rel Hum_%	Wind Speed_km/h	Visibility_km	Press_kPa	Weather
8646	12/26/2012 6:00	-13.4	-14.8	89	4	25.0	102.47	Clear
8698	12/28/2012 10:00	-6.1	-8.6	82	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

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

In [39]:

```
data.head(2)
```

Out[39]:

	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

In [41]:

```
data['Wind Speed_km/h'].value_counts()  
#Just shows the total count of wind speed which is 4
```

Out[41]:

9	830
11	791
13	735
15	719
7	677
17	666
19	616
6	609
20	496
4	474
22	439
24	374
0	309
26	242
28	205
30	161
32	139
33	85
35	53
37	45

```

39    24
41    22
44    14
43    13
48    13
46    11
52     7
57     5
50     4
2      2
83     1
70     1
63     1
54     1
Name: Wind Speed_km/h, dtype: int64

```

In [49]:

```

data[data['Wind Speed_km/h'] == 4]
#Filtering method Shows all the column which have windspeed as 4.

```

Out[49]:

	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
96	1/5/2012 0:00	-8.8	-11.7	79	4	9.7	100.32	Snow
101	1/5/2012 5:00	-7.0	-9.5	82	4	4.0	100.19	Snow
146	1/7/2012 2:00	-8.1	-11.1	79	4	19.3	100.15	Cloudy
...	...	...	...	...	...	...	...	...
8768	12/31/2012 8:00	-8.6	-10.3	87	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
8772	12/31/2012 12:00	-5.8	-7.5	88	4	12.9	100.78	Snow
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.

In [50]:

```

data.isnull()
#shows all the data which has null value (in boolean form)

```

Out[50]:

	Date/Time	Temp_C	Dew Point Temp_C	Rel Hum_%	Wind Speed_km/h	Visibility_km	Press_kPa	Weather
0	False	False	False	False	False	False	False	False
1	False	False	False	False	False	False	False	False
2	False	False	False	False	False	False	False	False
3	False	False	False	False	False	False	False	False
4	False	False	False	False	False	False	False	False
...	...	...	...	...	...	...	...	...
8779	False	False	False	False	False	False	False	False
8780	False	False	False	False	False	False	False	False
8781	False	False	False	False	False	False	False	False
8782	False	False	False	False	False	False	False	False
8783	False	False	False	False	False	False	False	False

8784 rows × 8 columns

In [52]:

```
data.isnull().sum()
#Sum of all the null values.
```

Out[52]:

```
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
```

In [56]:

```
data.notnull()
#shows data in boolean form
```

Out[56]:

	Date/Time	Temp_C	Dew Point Temp_C	Rel Hum_%	Wind Speed_km/h	Visibility_km	Press_kPa	Weather
0	True	True	True	True	True	True	True	True
1	True	True	True	True	True	True	True	True
2	True	True	True	True	True	True	True	True
3	True	True	True	True	True	True	True	True
4	True	True	True	True	True	True	True	True
...	...	...	...	...	...	...	...	...
8779	True	True	True	True	True	True	True	True

	Date/Time	Temp_C	Dew Point Temp_C	Rel Hum_%	Wind Speed_km/h	Visibility_km	Press_kPa	Weather
8780	True	True	True	True	True	True	True	True
8781	True	True	True	True	True	True	True	True
8782	True	True	True	True	True	True	True	True
8783	True	True	True	True	True	True	True	True

8784 rows × 8 columns

In [55]:

```
data.notnull().sum()
#sum of all the data that has no null value
# So the value is 8784 and above in isnan it has 0 concludes there is no null value.
```

Out[55]:

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 [57]:

```
data.rename(columns ={'Weather' : 'Weather Condition'})
#currently the column name change is temporary
```

Out[57]:

	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
2	1/1/2012 2:00	-1.8	-3.4	89	7	4.0	101.26	Freezing Drizzle,Fog
3	1/1/2012 3:00	-1.5	-3.2	88	6	4.0	101.27	Freezing Drizzle,Fog
4	1/1/2012 4:00	-1.5	-3.3	88	7	4.8	101.23	Fog
...	...	...	...	...	...	...	...	...
8779	12/31/2012 19:00	0.1	-2.7	81	30	9.7	100.13	Snow
8780	12/31/2012 20:00	0.2	-2.4	83	24	9.7	100.03	Snow

	Date/Time	Temp_C	Dew Point Temp_C	Rel Hum_%	Wind Speed_km/h	Visibility_km	Press_kPa	Weather Condition
8781	12/31/2012 21:00	-0.5	-1.5	93	28	4.8	99.95	Snow
8782	12/31/2012 22:00	-0.2	-1.8	89	28	9.7	99.91	Snow
8783	12/31/2012 23:00	0.0	-2.1	86	30	11.3	99.89	Snow

8784 rows × 8 columns

In [58]: `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

In [63]: `data.rename(columns ={'Weather' : 'Weather Condition'}, inplace = True)`  
*#inplace=True permantly changes the column name.*

In [64]: `data.head(2)`  
*#here we can see the change.*

	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

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

In [66]: `data.Visibility_km.mean()`  
*#mean function gives the mean of the value*

Out[66]: 27.66444672131151

**mean function gives the mean of the value**

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

In [67]:

```
data.head(2)
```

Out[67]:

	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

In [68]:

```
data.Press_kPa.std()  
#.std gives the standard deviation of the column required.
```

Out[68]:

```
0.8440047459486474
```

.std --> gives the standard deviation of the column required.

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

In [69]:

```
data.head(2)
```

Out[69]:

	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

In [70]:

```
data['Rel_Hum_%'].var()
```

Out[70]:

```
286.2485501984998
```

.var gives the variance of the column

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

In [71]:

```
data['Weather Condition'].value_counts()
```

Out[71]:

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
Freezing Fog	4
Snow Showers, Fog	4
Moderate Snow	4
Rain, Snow, Ice Pellets	4
Freezing Rain, Fog	4
Freezing Drizzle, Haze	3
Rain, Haze	3
Thunderstorms, Rain	3
Thunderstorms, Rain Showers, Fog	3
Freezing Rain, Haze	2
Drizzle, Snow	2
Rain Showers, Snow Showers	2
Thunderstorms	2
Moderate Snow, Blowing Snow	2
Rain Showers, Fog	1
Thunderstorms, Moderate Rain Showers, Fog	1
Snow Pellets	1
Rain, Snow, Fog	1
Moderate Rain, Fog	1
Freezing Rain, Ice Pellets, Fog	1
Drizzle, Ice Pellets, Fog	1
Thunderstorms, Rain, Fog	1
Rain, Ice Pellets	1
Rain, Snow Grains	1
Thunderstorms, Heavy Rain Showers	1
Freezing Rain, Snow Grains	1

Name: Weather Condition, dtype: int64

In [72]:

```
data[data['Weather Condition'] == 'Snow']
#filtering
```

Out[72]:

	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	-21.7	51	11	24.1	101.25	Snow
86	1/4/2012 14:00	-11.3	-19.0	53	7	19.3	100.97	Snow
87	1/4/2012 15:00	-10.2	-16.3	61	11	9.7	100.89	Snow

	Date/Time	Temp_C	Dew Point Temp_C	Rel Hum_%	Wind Speed_km/h	Visibility_km	Press_kPa	Weather Condition
88	1/4/2012 16:00	-9.4	-15.5	61	13	19.3	100.79	Snow
...	...	...	...	...	...	...	...	...
8779	12/31/2012 19:00	0.1	-2.7	81	30	9.7	100.13	Snow
8780	12/31/2012 20:00	0.2	-2.4	83	24	9.7	100.03	Snow
8781	12/31/2012 21:00	-0.5	-1.5	93	28	4.8	99.95	Snow
8782	12/31/2012 22:00	-0.2	-1.8	89	28	9.7	99.91	Snow
8783	12/31/2012 23:00	0.0	-2.1	86	30	11.3	99.89	Snow

390 rows × 8 columns

In [73]:

```
data.groupby('Weather Condition').get_group('Snow')
#groupby
```

Out[73]:

	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	-21.7	51	11	24.1	101.25	Snow
86	1/4/2012 14:00	-11.3	-19.0	53	7	19.3	100.97	Snow
87	1/4/2012 15:00	-10.2	-16.3	61	11	9.7	100.89	Snow
88	1/4/2012 16:00	-9.4	-15.5	61	13	19.3	100.79	Snow
...	...	...	...	...	...	...	...	...
8779	12/31/2012 19:00	0.1	-2.7	81	30	9.7	100.13	Snow
8780	12/31/2012 20:00	0.2	-2.4	83	24	9.7	100.03	Snow
8781	12/31/2012 21:00	-0.5	-1.5	93	28	4.8	99.95	Snow
8782	12/31/2012 22:00	-0.2	-1.8	89	28	9.7	99.91	Snow
8783	12/31/2012 23:00	0.0	-2.1	86	30	11.3	99.89	Snow

390 rows × 8 columns

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

In [74]:

`data.head(2)`

Out[74]:

	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

In [78]:

`data[(data['Wind Speed_km/h'] > 24) & (data['Visibility_km'] == 25)]`

Out[78]:

	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	2.0	79	30	25.0	99.31	Cloudy
24	1/2/2012 0:00	5.2	1.5	77	35	25.0	99.26	Rain Showers
25	1/2/2012 1:00	4.6	0.0	72	39	25.0	99.26	Cloudy
26	1/2/2012 2:00	3.9	-0.9	71	32	25.0	99.26	Mostly Cloudy
27	1/2/2012 3:00	3.7	-1.5	69	33	25.0	99.30	Mostly Cloudy
...	...	...	...	...	...	...	...	...
8705	12/28/2012 17:00	-8.6	-12.0	76	26	25.0	101.34	Mainly Clear
8753	12/30/2012 17:00	-12.1	-15.8	74	28	25.0	101.26	Mainly Clear
8755	12/30/2012 19:00	-13.4	-16.5	77	26	25.0	101.47	Mainly Clear
8759	12/30/2012 23:00	-12.1	-15.1	78	28	25.0	101.52	Mostly Cloudy
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 Condition' ?**

In [80]: `data.groupby('Weather Condition').mean()`

Out[80]:		Temp_C	Dew Point Temp_C	Rel Hum_%	Wind Speed_km/h	Visibility_km	Press_kPa
Weather Condition							
	<b>Clear</b>	6.825716	0.089367	64.497738	10.557315	30.153243	101.587443
	<b>Cloudy</b>	7.970544	2.375810	69.592593	16.127315	26.625752	100.911441
	<b>Drizzle</b>	7.353659	5.504878	88.243902	16.097561	17.931707	100.435366
	<b>Drizzle,Fog</b>	8.067500	7.033750	93.275000	11.862500	5.257500	100.786625
	<b>Drizzle,Ice Pellets,Fog</b>	0.400000	-0.700000	92.000000	20.000000	4.000000	100.790000
	<b>Drizzle,Snow</b>	1.050000	0.150000	93.500000	14.000000	10.500000	100.890000
	<b>Drizzle,Snow,Fog</b>	0.693333	0.120000	95.866667	15.533333	5.513333	99.281333
	<b>Fog</b>	4.303333	3.159333	92.286667	7.946667	6.248000	101.184067
	<b>Freezing Drizzle</b>	-5.657143	-8.000000	83.571429	16.571429	9.200000	100.202857
	<b>Freezing Drizzle,Fog</b>	-2.533333	-4.183333	88.500000	17.000000	5.266667	100.441667
	<b>Freezing Drizzle,Haze</b>	-5.433333	-8.000000	82.000000	10.333333	2.666667	100.316667
	<b>Freezing Drizzle,Snow</b>	-5.109091	-7.072727	86.090909	16.272727	5.872727	100.520909
	<b>Freezing Fog</b>	-7.575000	-9.250000	87.750000	4.750000	0.650000	102.320000
	<b>Freezing Rain</b>	-3.885714	-6.078571	84.642857	19.214286	8.242857	99.647143
	<b>Freezing Rain,Fog</b>	-2.225000	-3.750000	89.500000	15.500000	7.550000	99.945000
	<b>Freezing Rain,Haze</b>	-4.900000	-7.450000	82.500000	7.500000	2.400000	100.375000
	<b>Freezing Rain,Ice Pellets,Fog</b>	-2.600000	-3.700000	92.000000	28.000000	8.000000	100.950000
	<b>Freezing Rain,Snow Grains</b>	-5.000000	-7.300000	84.000000	32.000000	4.800000	98.560000
	<b>Haze</b>	-0.200000	-2.975000	81.625000	10.437500	7.831250	101.482500
	<b>Mainly Clear</b>	12.558927	4.581671	60.667142	14.144824	34.264862	101.248832
	<b>Moderate Rain,Fog</b>	1.700000	0.800000	94.000000	17.000000	6.400000	99.980000
	<b>Moderate Snow</b>	-5.525000	-7.250000	87.750000	33.750000	0.750000	100.275000
	<b>Moderate Snow,Blowing Snow</b>	-5.450000	-6.500000	92.500000	40.000000	0.600000	100.570000
	<b>Mostly Cloudy</b>	10.574287	3.131174	62.102465	15.813920	31.253842	101.025288
	<b>Rain</b>	9.786275	7.042810	83.624183	19.254902	18.856536	100.233333
	<b>Rain Showers</b>	13.722340	9.187766	75.159574	17.132979	22.816489	100.404043
	<b>Rain Showers,Fog</b>	12.800000	12.100000	96.000000	13.000000	6.400000	99.830000
	<b>Rain Showers,Snow Showers</b>	2.150000	-1.500000	76.500000	22.500000	21.700000	101.100000

	Temp_C	Dew Point Temp_C	Rel Hum_%	Wind Speed_km/h	Visibility_km	Press_kPa
Weather Condition						
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

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

In [81]:

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

Out[81]:

Weather Condition	Date/Time	Temp_C	Dew Point Temp_C	Rel Hum_%	Wind Speed_km/h	Visibility_km	Press_kPa

	Date/Time	Temp_C	Dew Point Temp_C	Rel Hum_%	Wind Speed_km/h	Visibility_km	Press_kPa
Weather Condition							
<b>Clear</b>	1/11/2012 1:00	-23.3	-28.5	20	0	11.3	99.52
<b>Cloudy</b>	1/1/2012 17:00	-21.4	-26.8	18	0	11.3	98.39
<b>Drizzle</b>	1/23/2012 21:00	1.1	-0.2	74	0	6.4	97.84
<b>Drizzle,Fog</b>	1/23/2012 20:00	0.0	-1.6	85	0	1.0	98.65
<b>Drizzle,Ice Pellets,Fog</b>	12/17/2012 9:00	0.4	-0.7	92	20	4.0	100.79
<b>Drizzle,Snow</b>	12/17/2012 15:00	0.9	0.1	92	9	9.7	100.63
<b>Drizzle,Snow,Fog</b>	12/18/2012 21:00	0.3	-0.1	92	7	2.4	97.79
<b>Fog</b>	1/1/2012 0:00	-16.0	-17.2	80	0	0.2	98.31
<b>Freezing Drizzle</b>	1/13/2012 10:00	-9.0	-12.2	78	6	4.8	98.44
<b>Freezing Drizzle,Fog</b>	1/1/2012 2:00	-6.4	-9.0	82	6	3.6	98.74
<b>Freezing Drizzle,Haze</b>	2/1/2012 11:00	-5.8	-8.3	81	9	2.0	100.28
<b>Freezing Drizzle,Snow</b>	1/13/2012 3:00	-8.3	-10.4	79	6	2.4	99.19
<b>Freezing Fog</b>	1/22/2012 6:00	-19.0	-22.9	71	0	0.2	101.97
<b>Freezing Rain</b>	1/13/2012 11:00	-6.5	-9.0	81	7	2.8	98.22
<b>Freezing Rain,Fog</b>	1/17/2012 23:00	-6.1	-8.7	82	7	2.8	98.32
<b>Freezing Rain,Haze</b>	2/1/2012 14:00	-4.9	-7.5	82	6	2.0	100.34
<b>Freezing Rain,Ice Pellets,Fog</b>	12/17/2012 3:00	-2.6	-3.7	92	28	8.0	100.95
<b>Freezing Rain,Snow Grains</b>	1/13/2012 9:00	-5.0	-7.3	84	32	4.8	98.56
<b>Haze</b>	1/22/2012 12:00	-11.5	-16.0	68	0	4.8	100.35
<b>Mainly Clear</b>	1/10/2012 11:00	-22.8	-28.0	20	0	12.9	98.67

	Date/Time	Temp_C	Dew Point Temp_C	Rel Hum_%	Wind Speed_km/h	Visibility_km	Press_kPa
Weather Condition							
<b>Moderate Rain,Fog</b>	12/10/2012 8:00	1.7	0.8	94	17	6.4	99.98
<b>Moderate Snow</b>	1/12/2012 15:00	-6.3	-7.6	83	26	0.6	99.88
<b>Moderate Snow,Blowing Snow</b>	12/27/2012 10:00	-5.5	-6.6	92	39	0.6	100.50
<b>Mostly Cloudy</b>	1/1/2012 16:00	-23.2	-28.5	18	0	11.3	98.36
<b>Rain</b>	1/1/2012 18:00	0.3	-5.7	40	0	4.0	97.52
<b>Rain Showers</b>	1/1/2012 22:00	1.6	-7.2	37	0	6.4	98.51
<b>Rain Showers,Fog</b>	10/20/2012 3:00	12.8	12.1	96	13	6.4	99.83
<b>Rain Showers,Snow Showers</b>	11/4/2012 8:00	2.1	-1.8	75	17	19.3	101.09
<b>Rain,Fog</b>	1/23/2012 18:00	0.0	-1.2	83	0	2.0	98.61
<b>Rain,Haze</b>	3/13/2012 7:00	4.0	1.0	81	7	4.0	100.50
<b>Rain,Ice Pellets</b>	12/18/2012 5:00	0.6	-0.6	92	24	9.7	100.12
<b>Rain,Snow</b>	1/10/2012 5:00	0.6	-1.7	81	13	2.4	98.18
<b>Rain,Snow Grains</b>	12/21/2012 0:00	1.9	-2.1	75	26	25.0	100.60
<b>Rain,Snow,Fog</b>	12/8/2012 21:00	0.8	0.3	96	9	6.4	100.73
<b>Rain,Snow,Ice Pellets</b>	12/21/2012 1:00	0.9	-0.7	88	17	4.8	99.85
<b>Snow</b>	1/10/2012 1:00	-16.7	-24.6	41	0	1.0	97.75
<b>Snow Pellets</b>	11/24/2012 15:00	0.7	-6.4	59	35	2.4	99.70
<b>Snow Showers</b>	1/12/2012 7:00	-13.3	-19.3	52	0	2.4	99.49
<b>Snow Showers,Fog</b>	12/26/2012 9:00	-11.3	-12.7	89	7	4.0	100.63
<b>Snow,Blowing Snow</b>	1/13/2012 21:00	-12.0	-16.2	70	24	0.6	98.11

	Date/Time	Temp_C	Dew Point Temp_C	Rel Hum_%	Wind Speed_km/h	Visibility_km	Press_kPa
Weather Condition							
Snow,Fog	12/16/2012 15:00	-10.1	-12.0	77	4	1.2	99.38
Snow,Haze	2/1/2012 17:00	-4.3	-7.2	80	0	4.0	100.61
Snow,Ice Pellets	12/10/2012 3:00	-4.3	-5.9	76	19	2.8	99.40
Thunderstorms	7/16/2012 1:00	21.6	19.4	67	0	24.1	99.84
Thunderstorms,Heavy Rain Showers	5/29/2012 6:00	10.9	9.0	88	9	2.4	100.26
Thunderstorms,Moderate Rain Showers,Fog	7/17/2012 6:00	19.6	18.5	93	15	3.2	100.01
Thunderstorms,Rain	5/25/2012 20:00	19.4	18.2	83	4	16.1	100.19
Thunderstorms,Rain Showers	5/29/2012 16:00	11.0	7.0	68	7	6.4	99.65
Thunderstorms,Rain Showers,Fog	6/29/2012 3:00	19.5	16.1	80	7	9.7	99.71
Thunderstorms,Rain,Fog	7/17/2012 5:00	20.6	18.6	88	19	4.8	100.08

In [82]: `data.groupby('Weather Condition').max()`

Out[82]:

	Date/Time	Temp_C	Dew Point Temp_C	Rel Hum_%	Wind Speed_km/h	Visibility_km	Press_kPa
Weather Condition							
Clear	9/9/2012 5:00	32.8	20.4	99	33	48.3	103.63
Cloudy	9/9/2012 23:00	30.5	22.6	99	54	48.3	103.65
Drizzle	9/30/2012 3:00	18.8	17.7	96	30	25.0	101.56
Drizzle,Fog	9/30/2012 2:00	19.9	19.1	100	28	9.7	102.07
Drizzle,Ice Pellets,Fog	12/17/2012 9:00	0.4	-0.7	92	20	4.0	100.79
Drizzle,Snow	12/19/2012 18:00	1.2	0.2	95	19	11.3	101.15

	Date/Time	Temp_C	Dew Point Temp_C	Rel Hum_%	Wind Speed_km/h	Visibility_km	Press_kPa
Weather Condition							
<b>Drizzle,Snow,Fog</b>	12/22/2012 3:00	1.1	0.6	98	32	9.7	100.15
<b>Fog</b>	9/22/2012 0:00	20.8	19.6	100	22	9.7	103.04
<b>Freezing Drizzle</b>	2/1/2012 5:00	-2.3	-3.3	93	26	12.9	101.02
<b>Freezing Drizzle,Fog</b>	12/10/2012 5:00	-0.3	-2.3	94	33	8.0	101.27
<b>Freezing Drizzle,Haze</b>	2/1/2012 13:00	-5.0	-7.7	83	11	4.0	100.36
<b>Freezing Drizzle,Snow</b>	3/2/2012 12:00	-3.3	-4.6	94	24	12.9	101.18
<b>Freezing Fog</b>	3/17/2012 6:00	-0.1	-0.3	99	9	0.8	102.85
<b>Freezing Rain</b>	2/1/2012 7:00	0.3	-1.7	92	28	16.1	101.00
<b>Freezing Rain,Fog</b>	12/17/2012 1:00	0.1	-0.9	93	26	9.7	101.01
<b>Freezing Rain,Haze</b>	2/1/2012 15:00	-4.9	-7.4	83	9	2.8	100.41
<b>Freezing Rain,Ice Pellets,Fog</b>	12/17/2012 3:00	-2.6	-3.7	92	28	8.0	100.95
<b>Freezing Rain,Snow Grains</b>	1/13/2012 9:00	-5.0	-7.3	84	32	4.8	98.56
<b>Haze</b>	3/13/2012 23:00	14.1	11.1	86	17	9.7	102.97
<b>Mainly Clear</b>	9/9/2012 9:00	33.0	21.2	99	63	48.3	103.59
<b>Moderate Rain,Fog</b>	12/10/2012 8:00	1.7	0.8	94	17	6.4	99.98
<b>Moderate Snow</b>	12/27/2012 9:00	-4.9	-6.7	93	39	0.8	100.67
<b>Moderate Snow,Blowing Snow</b>	12/27/2012 12:00	-5.4	-6.4	93	41	0.6	100.64
<b>Mostly Cloudy</b>	9/9/2012 2:00	32.4	24.4	100	83	48.3	103.65
<b>Rain</b>	9/5/2012 2:00	22.8	20.4	99	52	48.3	102.26
<b>Rain Showers</b>	9/8/2012 16:00	26.4	23.0	97	41	48.3	102.31

	Date/Time	Temp_C	Dew Point Temp_C	Rel Hum_%	Wind Speed_km/h	Visibility_km	Press_kPa
Weather Condition							
Rain Showers,Fog	10/20/2012 3:00	12.8	12.1	96	13	6.4	99.83
Rain Showers,Snow Showers	12/5/2012 10:00	2.2	-1.2	78	28	24.1	101.11
Rain,Fog	9/30/2012 23:00	21.7	19.5	100	46	9.7	101.77
Rain,Haze	3/13/2012 9:00	5.5	2.9	86	17	9.7	100.61
Rain,Ice Pellets	12/18/2012 5:00	0.6	-0.6	92	24	9.7	100.12
Rain,Snow	4/23/2012 3:00	1.7	0.5	94	52	25.0	101.07
Rain,Snow Grains	12/21/2012 0:00	1.9	-2.1	75	26	25.0	100.60
Rain,Snow,Fog	12/8/2012 21:00	0.8	0.3	96	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	-6.4	59	35	2.4	99.70
Snow Showers	3/4/2012 21:00	2.9	-0.7	94	37	48.3	102.50
Snow Showers,Fog	12/29/2012 13:00	-10.0	-11.1	92	22	9.7	102.52
Snow,Blowing Snow	2/25/2012 9:00	-1.4	-2.9	91	48	9.7	100.62
Snow,Fog	3/14/2012 19:00	1.1	0.8	99	35	9.7	102.07
Snow,Haze	2/1/2012 21:00	-3.6	-6.4	81	15	6.4	100.99
Snow,Ice Pellets	3/3/2012 4:00	0.8	-1.7	92	33	11.3	100.96
Thunderstorms	7/4/2012 16:00	26.7	20.1	87	15	25.0	100.62
Thunderstorms,Heavy Rain Showers	5/29/2012 6:00	10.9	9.0	88	9	2.4	100.26
Thunderstorms,Moderate Rain Showers,Fog	7/17/2012 6:00	19.6	18.5	93	15	3.2	100.01

	Date/Time	Temp_C	Dew Point Temp_C	Rel Hum_%	Wind Speed_km/h	Visibility_km	Press_kPa
Weather Condition							
Thunderstorms,Rain	7/23/2012 18:00	21.3	19.1	93	30	24.1	100.83
Thunderstorms,Rain Showers	9/8/2012 4:00	25.5	23.1	98	32	25.0	101.06
Thunderstorms,Rain Showers,Fog	7/31/2012 20:00	22.9	21.3	91	35	9.7	100.64
Thunderstorms,Rain,Fog	7/17/2012 5:00	20.6	18.6	88	19	4.8	100.08

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

In [84]:

```
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	-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
4	1/1/2012 4:00	-1.5	-3.3	88	7	4.8	101.23	Fog
5	1/1/2012 5:00	-1.4	-3.3	87	9	6.4	101.27	Fog
6	1/1/2012 6:00	-1.5	-3.1	89	7	6.4	101.29	Fog
...	...	...	...	...	...	...	...	...
8716	12/29/2012 4:00	-16.0	-17.2	90	6	9.7	101.25	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
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 [85]:

```
data[(data['Weather Condition'] == 'Clear') & (data['Visibility_km'] > 40)]
```

Out[85]:

	Date/Time	Temp_C	Dew Point Temp_C	Rel Hum_%	Wind Speed_km/h	Visibility_km	Press_kPa	Weather Condition
351	1/15/2012 15:00	-15.4	-22.8	53	24	48.3	102.71	Clear
352	1/15/2012 16:00	-15.1	-22.8	52	24	48.3	102.79	Clear
425	1/18/2012 17:00	-11.3	-18.8	54	26	48.3	101.54	Clear
440	1/19/2012 8:00	-13.7	-18.4	68	19	48.3	101.84	Clear
441	1/19/2012 9:00	-12.7	-17.2	69	17	48.3	101.73	Clear
...	...	...	...	...	...	...	...	...
8384	12/15/2012 8:00	-10.7	-15.6	67	13	48.3	102.69	Clear
8385	12/15/2012 9:00	-10.4	-15.9	64	19	48.3	102.74	Clear
8389	12/15/2012 13:00	-8.4	-14.7	60	19	48.3	102.64	Clear
8631	12/25/2012 15:00	-7.1	-13.7	59	17	48.3	101.98	Clear
8632	12/25/2012 16:00	-7.5	-13.9	60	11	48.3	102.03	Clear

313 rows × 8 columns

**Q. 15) Find all instances when :**

**A. 'Weather is Clear' and 'Relative Humidity is greater than 50'**

**or**

**B. 'Visibility is above 40'**

In [86]:

```
data[(data['Weather Condition'] == 'Clear') & (data['Rel Hum_%'] == 50) | (data['Visibility'] > 40)]
```

Out[86]:

	Date/Time	Temp_C	Dew Point Temp_C	Rel Hum_%	Wind Speed_km/h	Visibility_km	Press_kPa	Weather Condition
67	1/3/2012 19:00	-16.9	-24.8	50	24	25.0	101.74	Clear

	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	-10.0	73	17	48.3	100.45	Mainly Clear
107	1/5/2012 11:00	-5.6	-10.2	70	22	48.3	100.41	Mainly Clear
108	1/5/2012 12:00	-4.7	-9.6	69	20	48.3	100.38	Mainly Clear
109	1/5/2012 13:00	-4.4	-9.7	66	26	48.3	100.40	Mainly Clear
...	...	...	...	...	...	...	...	...
8748	12/30/2012 12:00	-12.2	-15.7	75	26	48.3	100.91	Mostly Cloudy
8749	12/30/2012 13:00	-12.4	-16.2	73	37	48.3	100.92	Mostly Cloudy
8750	12/30/2012 14:00	-11.8	-16.1	70	37	48.3	100.96	Mainly Clear
8751	12/30/2012 15:00	-11.3	-15.6	70	32	48.3	101.05	Mainly Clear
8752	12/30/2012 16:00	-11.4	-15.5	72	26	48.3	101.15	Mainly Clear

2026 rows × 8 columns

In [ ]: