The whether Dataset

Here The whether Dataset is a time series(change on time to time) data set with per hour information about the wheather conditions at a particular location.It records Temparature ,Relative Humidity,Windspeed,Visibility,Pressure and conditions

This data is available as a CSV File .We are going to analylze this data set using Pandas

In [1]:
```
import pandas as pd
```

```
data=pd.read_csv(r"C:\Users\HP LAPTOP\Downloads\1.-Weather-Data.csv")
```

Type *Markdown* and LaTeX: α^2

In [5]:
```
data
```

Out[5]:

	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

How to analyze the data?

.head()

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

In [6]:
```
data.head()
```

Out[6]:

	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 columns of the dataframe

In [7]:
```
data.shape
```

Out[7]:
```
(8784, 8)
```

.index

this attribute provides the index of the dataframe

In [8]:
```
data.index
```

Out[8]:
```
RangeIndex(start=0, stop=8784, step=1)
```

.coloumns

It shows the name of each column

In [9]:
```
data.columns
```

Out[9]:
```
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 [10]:
```
data.dtypes
```

Out[10]:
```
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 , not on the whole dataframe

In [11]:
```
data['Weather'].unique()
```

Out[11]:
```
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

In [12]:
```
data['Weather'].nunique
```

Out[12]:
```
<bound method IndexOpsMixin.nunique of 0                         Fog
1                         Fog
2       Freezing Drizzle,Fog
3       Freezing Drizzle,Fog
4                         Fog
                ...
8779                    Snow
8780                    Snow
8781                    Snow
8782                    Snow
8783                    Snow
Name: Weather, Length: 8784, dtype: object>
```

.count()

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

In [13]:
```
data.count()
```

Out[13]:
```
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 a single column only

In [14]:
```
data['Weather'].value_counts()
```

Out[14]:
```
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
```

.info()

It provides basic information about data frame

In [15]:
```
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
```

Q1. Find all the unique "wind speed " values in the data

In [16]:
```
data.head()
```

Out[16]:

	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

In [17]:
```
data["Wind Speed_km/h"].unique()
```

Out[17]:
```
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)
```

In [18]:
```
data["Wind Speed_km/h"].nunique()
```

Out[18]: 34

Q2. Find the no.of times when the "Wheather is exactly clear"

In [19]:
```
data.Weather.value_counts()
```

Out[19]:

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 [ ]:
```
data[data.Weather=='clear']
```

Q3. Find the no.of times when the "wind speed was exactly 4km/h"

In [20]:
```
data[data["Wind Speed_km/h"]==4]
```

Out[20]:

	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

Q4. Find out all the null values in the data

In [21]:
```
data.isnull().sum()
```

Out[21]:
```
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
```

Q5. Rename the column name "Wheather "of the dataframe to "Weather condition"

In [22]:
```
data.rename(columns={"Weather":"Weather condition"})
```

Out[22]:

	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
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

Q6. What is the mean "visibility"

In [23]:
```
data.Visibility_km.mean()
```

Out[23]:
```
27.66444672131151
```

Q7. What is Standard deviation of pressure in this data

In [24]:
```
data.Press_kPa.std()
```

Out[24]:
```
0.8440047459486474
```

Q8. What is the Variance of "Relative Humidity" in this data

In [28]:
```
data.head(5)
```

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
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

In [27]:
```
data['Rel Hum_%'].var()
```

Out[27]:
```
286.2485501984998
```

Q9. Find all the Instances when "snow" was recorded

In [30]:
```
data[data.Weather=='Snow']
```

Out[30]:

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

Q10. Find all the instances when the "wind speed is above 24" & visiblility is 25

In [31]:
```
data[(data['Wind Speed_km/h']>24) & (data['Visibility_km']==25)]
```

Out[31]:

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

Q11. What is the mean value of each column against each "Weather"

In [32]:
```
data.groupby('Weather').mean()
```

Out[32]:

Weather	Temp_C	Dew Point Temp_C	Rel Hum_%	Wind Speed_km/h	Visibility_km	Press_kPa
Clear	6.825716	0.089367	64.497738	10.557315	30.153243	101.58744
Cloudy	7.970544	2.375810	69.592593	16.127315	26.625752	100.91144
Drizzle	7.353659	5.504878	88.243902	16.097561	17.931707	100.43536
Drizzle,Fog	8.067500	7.033750	93.275000	11.862500	5.257500	100.78662
Drizzle,Ice Pellets,Fog	0.400000	-0.700000	92.000000	20.000000	4.000000	100.79000
Drizzle,Snow	1.050000	0.150000	93.500000	14.000000	10.500000	100.89000
Drizzle,Snow,Fog	0.693333	0.120000	95.866667	15.533333	5.513333	99.28133
Fog	4.303333	3.159333	92.286667	7.946667	6.248000	101.18406
Freezing Drizzle	-5.657143	-8.000000	83.571429	16.571429	9.200000	100.20285
Freezing Drizzle,Fog	-2.533333	-4.183333	88.500000	17.000000	5.266667	100.44166
Freezing Drizzle,Haze	-5.433333	-8.000000	82.000000	10.333333	2.666667	100.31666
Freezing Drizzle,Snow	-5.109091	-7.072727	86.090909	16.272727	5.872727	100.52090
Freezing Fog	-7.575000	-9.250000	87.750000	4.750000	0.650000	102.32000
Freezing Rain	-3.885714	-6.078571	84.642857	19.214286	8.242857	99.64714
Freezing Rain,Fog	-2.225000	-3.750000	89.500000	15.500000	7.550000	99.94500
Freezing Rain,Haze	-4.900000	-7.450000	82.500000	7.500000	2.400000	100.37500
Freezing Rain,Ice Pellets,Fog	-2.600000	-3.700000	92.000000	28.000000	8.000000	100.95000
Freezing Rain,Snow Grains	-5.000000	-7.300000	84.000000	32.000000	4.800000	98.56000
Haze	-0.200000	-2.975000	81.625000	10.437500	7.831250	101.48250
Mainly Clear	12.558927	4.581671	60.667142	14.144824	34.264862	101.24883
Moderate Rain,Fog	1.700000	0.800000	94.000000	17.000000	6.400000	99.98000
Moderate Snow	-5.525000	-7.250000	87.750000	33.750000	0.750000	100.27500
Moderate Snow,Blowing Snow	-5.450000	-6.500000	92.500000	40.000000	0.600000	100.57000
Mostly Cloudy	10.574287	3.131174	62.102465	15.813920	31.253842	101.02528
Rain	9.786275	7.042810	83.624183	19.254902	18.856536	100.23333
Rain Showers	13.722340	9.187766	75.159574	17.132979	22.816489	100.40404
Rain Showers,Fog	12.800000	12.100000	96.000000	13.000000	6.400000	99.83000
Rain Showers,Snow Showers	2.150000	-1.500000	76.500000	22.500000	21.700000	101.10000
Rain,Fog	8.273276	7.219828	93.189655	14.793103	6.873276	100.50086
Rain,Haze	4.633333	2.066667	83.333333	11.666667	6.700000	100.54000
Rain,Ice Pellets	0.600000	-0.600000	92.000000	24.000000	9.700000	100.12000
Rain,Snow	1.055556	-0.566667	89.000000	28.388889	11.672222	99.95111

Weather	Temp_C	Dew Point Temp_C	Rel Hum_%	Wind Speed_km/h	Visibility_km	Press_kPa
Rain,Snow Grains	1.900000	-2.100000	75.000000	26.000000	25.000000	100.60000
Rain,Snow,Fog	0.800000	0.300000	96.000000	9.000000	6.400000	100.73000
Rain,Snow,Ice Pellets	1.100000	-0.175000	91.500000	23.250000	6.000000	100.10500
Snow	-4.524103	-7.623333	79.307692	20.038462	11.171795	100.53610
Snow Pellets	0.700000	-6.400000	59.000000	35.000000	2.400000	99.70000
Snow Showers	-3.506667	-7.866667	72.350000	19.233333	20.158333	100.96350
Snow Showers,Fog	-10.675000	-11.900000	90.750000	13.750000	7.025000	101.29250
Snow,Blowing Snow	-5.410526	-7.621053	84.473684	34.842105	4.105263	99.70473
Snow,Fog	-5.075676	-6.364865	90.675676	17.324324	4.537838	100.68864
Snow,Haze	-4.020000	-6.860000	80.600000	5.000000	4.640000	100.78200
Snow,Ice Pellets	-1.883333	-3.666667	87.666667	23.833333	7.416667	100.54833
Thunderstorms	24.150000	19.750000	77.000000	7.500000	24.550000	100.23000
Thunderstorms,Heavy Rain Showers	10.900000	9.000000	88.000000	9.000000	2.400000	100.26000
Thunderstorms,Moderate Rain Showers,Fog	19.600000	18.500000	93.000000	15.000000	3.200000	100.01000
Thunderstorms,Rain	20.433333	18.533333	89.000000	15.666667	19.833333	100.42000
Thunderstorms,Rain Showers	20.037500	17.618750	86.375000	18.312500	15.893750	100.23375
Thunderstorms,Rain Showers,Fog	21.600000	18.700000	84.000000	19.666667	9.700000	100.06333
Thunderstorms,Rain,Fog	20.600000	18.600000	88.000000	19.000000	4.800000	100.08000

Q12. What is the minimum and maximum value of each column against each weather condition

In [3]:
```
data.head()
```

Out[3]:

	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

```
data.groupby("Weather").max()
```

Q13. Show all the records where weather condition is fog

In [7]:
```
data[data["Weather"]=='Fog']
```

Out[7]:

	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
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

Q14. Find all the instances when weather is 'Clear' or visibility is above 40

In [8]:
```
data[(data["Weather"]=="Clear")|(data['Visibility_km']>40)]
```

Out[8]:

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

3027 rows × 8 columns