In [1]:

```python
import pandas as pd
import numpy as np
```

In [104]:

```python
df=pd.read_csv("C:/Users/DELL/Desktop/1. Weather Data.csv",parse_dates=["Date/Time"])
df.head()
```

Out[104]:

	Date/Time	Temp_C	Dew Point Temp_C	Rel Hum_%	Wind Speed_km/h	Visibility_km	Press_kPa	Weather
0	2012-01-01 00:00:00	-1.8	-3.9	86	4	8.0	101.24	Fog
1	2012-01-01 01:00:00	-1.8	-3.7	87	4	8.0	101.24	Fog
2	2012-01-01 02:00:00	-1.8	-3.4	89	7	4.0	101.26	Freezing Drizzle,Fog
3	2012-01-01 03:00:00	-1.5	-3.2	88	6	4.0	101.27	Freezing Drizzle,Fog
4	2012-01-01 04:00:00	-1.5	-3.3	88	7	4.8	101.23	Fog

In [17]:

```python
df.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   datetime64[ns]
 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: datetime64[ns](1), float64(4), int64(2), object(1)
memory usage: 549.1+ KB
```

In [18]:

```python
df.describe()
```

Out[18]:

	Temp_C	Dew Point Temp_C	Rel Hum_%	Wind Speed_km/h	Visibility_km	Press_kPa
count	8784.000000	8784.000000	8784.000000	8784.000000	8784.000000	8784.000000
mean	8.798144	2.555294	67.431694	14.945469	27.664447	101.051623
std	11.687883	10.883072	16.918881	8.688696	12.622688	0.844005
min	-23.300000	-28.500000	18.000000	0.000000	0.200000	97.520000
25%	0.100000	-5.900000	56.000000	9.000000	24.100000	100.560000
50%	9.300000	3.300000	68.000000	13.000000	25.000000	101.070000
75%	18.800000	11.800000	81.000000	20.000000	25.000000	101.590000
max	33.000000	24.400000	100.000000	83.000000	48.300000	103.650000

In [19]:

```python
df.shape
```

Out[19]:

```
(8784, 8)
```

In [20]:

```python
df.columns
```

Out[20]:

```
Index(['Date/Time', 'Temp_C', 'Dew Point Temp_C', 'Rel Hum_%',
       'Wind Speed_km/h', 'Visibility_km', 'Press_kPa', 'Weather'],
      dtype='object')
```

In [21]:

```python
df.index
```

Out[21]:

```
RangeIndex(start=0, stop=8784, step=1)
```

In [22]:

```python
df.dtypes
```

Out[22]:

```
Date/Time          datetime64[ns]
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
```

In [24]:

```python
df["Weather"].unique()
```

Out[24]:

```
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)
```

In [25]:

```python
df.nunique()
```

Out[25]:

```
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 [26]:

```python
df.count()
```

Out[26]:

```
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 [31]:

```python
df["Weather"].value_counts()
```

Out[31]:

```
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 [32]:

```python
#findthe unique values of windspeed
df.head(2)
```

Out[32]:

	Date/Time	Temp_C	Dew Point Temp_C	Rel Hum_%	Wind Speed_km/h	Visibility_km	Press_kPa	Weather
0	2012-01-01 00:00:00	-1.8	-3.9	86	4	8.0	101.24	Fog
1	2012-01-01 01:00:00	-1.8	-3.7	87	4	8.0	101.24	Fog

In [35]:

```python
df["Wind Speed_km/h"].unique()
```

Out[35]:

```
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 [36]:

```python
# to count the unique values
df["Wind Speed_km/h"].nunique()
```

Out[36]:

34

In [63]:

```python
#find the number of times when the "weather is exactly clear"
df["Weather"][df["Weather"]=="Clear"].count()
```

Out[63]:

1326

In [64]:

```python
df["Weather"].value_counts()
```

Out[64]:

```
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 [78]:

```python
df.groupby("Weather").get_group("Clear").count()
```

Out[78]:

```
Date/Time           1326
Temp_C              1326
Dew Point Temp_C    1326
Rel Hum_%           1326
Wind Speed_km/h     1326
Visibility_km       1326
Press_kPa           1326
Weather             1326
dtype: int64
```

In [79]:

```python
#Number of times the windspeed was extractly 4 kmph
df.head(2)
```

Out[79]:

	Date/Time	Temp_C	Dew Point Temp_C	Rel Hum_%	Wind Speed_km/h	Visibility_km	Press_kPa	Weather
0	2012-01-01 00:00:00	-1.8	-3.9	86	4	8.0	101.24	Fog
1	2012-01-01 01:00:00	-1.8	-3.7	87	4	8.0	101.24	Fog

In [87]:

```python
df["Wind Speed_km/h"][df["Wind Speed_km/h"]==4].count()
```

Out[87]:

```
474
```

In [88]:

```python
#Null values
df.isnull().sum()
```

Out[88]:

```
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 [89]:

```python
df.notnull().sum()
```

Out[89]:

```
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 [92]:

```python
#To rename Weather column name to "Weather Condition"
new_df=df.rename(columns={"Weather":"Weather Condition"})
new_df
```

Out[92]:

	Date/Time	Temp_C	Dew Point Temp_C	Rel Hum_%	Wind Speed_km/h	Visibility_km	Press_kPa	Weather Condition
0	2012-01-01 00:00:00	-1.8	-3.9	86	4	8.0	101.24	Fog
1	2012-01-01 01:00:00	-1.8	-3.7	87	4	8.0	101.24	Fog
2	2012-01-01 02:00:00	-1.8	-3.4	89	7	4.0	101.26	Freezing Drizzle,Fog
3	2012-01-01 03:00:00	-1.5	-3.2	88	6	4.0	101.27	Freezing Drizzle,Fog
4	2012-01-01 04:00:00	-1.5	-3.3	88	7	4.8	101.23	Fog
...	...	...	...	...	...	...	...	...
8779	2012-12-31 19:00:00	0.1	-2.7	81	30	9.7	100.13	Snow
8780	2012-12-31 20:00:00	0.2	-2.4	83	24	9.7	100.03	Snow
8781	2012-12-31 21:00:00	-0.5	-1.5	93	28	4.8	99.95	Snow
8782	2012-12-31 22:00:00	-0.2	-1.8	89	28	9.7	99.91	Snow
8783	2012-12-31 23:00:00	0.0	-2.1	86	30	11.3	99.89	Snow

8784 rows × 8 columns

In [93]:

```python
# what is mean for "Visibilty"
df["Visibility_km"].mean()
```

Out[93]:

27.664446721311478

In [94]:

```python
#What is standard deviation of pressure?
df["Press_kPa"].std()
```

Out[94]:

0.8440047459486483

In [95]:

```python
#What is Variance of relative humdity?
df["Rel Hum_%"].var()
```

Out[95]:

286.24855019850196

In [97]:

```python
#Find the instance when snow is recorded?
df.head(2)
```

Out[97]:

	Date/Time	Temp_C	Dew Point Temp_C	Rel Hum_%	Wind Speed_km/h	Visibility_km	Press_kPa	Weather
0	2012-01-01 00:00:00	-1.8	-3.9	86	4	8.0	101.24	Fog
1	2012-01-01 01:00:00	-1.8	-3.7	87	4	8.0	101.24	Fog

In [105]:

```python
df["Weather"][df["Weather"]=="Snow"].count()
```

Out[105]:

390

In [107]:

```python
df["Weather"][df["Weather"]=="Snow"].value_counts()
```

Out[107]:

```
Snow    390
Name: Weather, dtype: int64
```

In [110]:

```python
# when snow word is present
df[df["Weather"].str.contains("Snow")]
```

Out[110]:

	Date/Time	Temp_C	Dew Point Temp_C	Rel Hum_%	Wind Speed_km/h	Visibility_km	Press_kPa	Weather
41	2012-01-02 17:00:00	-2.1	-9.5	57	22	25.0	99.66	Snow Showers
44	2012-01-02 20:00:00	-5.6	-13.4	54	24	25.0	100.07	Snow Showers
45	2012-01-02 21:00:00	-5.8	-12.8	58	26	25.0	100.15	Snow Showers
47	2012-01-02 23:00:00	-7.4	-14.1	59	17	19.3	100.27	Snow Showers
48	2012-01-03 00:00:00	-9.0	-16.0	57	28	25.0	100.35	Snow Showers
...	...	...	...	...	...	...	...	...
8779	2012-12-31 19:00:00	0.1	-2.7	81	30	9.7	100.13	Snow
8780	2012-12-31 20:00:00	0.2	-2.4	83	24	9.7	100.03	Snow
8781	2012-12-31 21:00:00	-0.5	-1.5	93	28	4.8	99.95	Snow
8782	2012-12-31 22:00:00	-0.2	-1.8	89	28	9.7	99.91	Snow
8783	2012-12-31 23:00:00	0.0	-2.1	86	30	11.3	99.89	Snow

583 rows × 8 columns

In [121]:

```python
#Find instance where windspeed is above 24 and visiblity is 25
df[(df["Wind Speed_km/h"]>=24) & (df["Visibility_km"]==25)].count()
```

Out[121]:

```
Date/Time          415
Temp_C             415
Dew Point Temp_C   415
Rel Hum_%          415
Wind Speed_km/h    415
Visibility_km      415
Press_kPa          415
Weather            415
dtype: int64
```

In [122]:

```python
df[(df["Wind Speed_km/h"]>=24) & (df["Visibility_km"]==25)]
```

Out[122]:

	Date/Time	Temp_C	Dew Point Temp_C	Rel Hum_%	Wind Speed_km/h	Visibility_km	Press_kPa	Weather
23	2012-01-01 23:00:00	5.3	2.0	79	30	25.0	99.31	Cloudy
24	2012-01-02 00:00:00	5.2	1.5	77	35	25.0	99.26	Rain Showers
25	2012-01-02 01:00:00	4.6	0.0	72	39	25.0	99.26	Cloudy
26	2012-01-02 02:00:00	3.9	-0.9	71	32	25.0	99.26	Mostly Cloudy
27	2012-01-02 03:00:00	3.7	-1.5	69	33	25.0	99.30	Mostly Cloudy
...	...	...	...	...	...	...	...	...
8754	2012-12-30 18:00:00	-12.6	-16.0	76	24	25.0	101.36	Mainly Clear
8755	2012-12-30 19:00:00	-13.4	-16.5	77	26	25.0	101.47	Mainly Clear
8756	2012-12-30 20:00:00	-13.8	-16.5	80	24	25.0	101.52	Clear
8759	2012-12-30 23:00:00	-12.1	-15.1	78	28	25.0	101.52	Mostly Cloudy
8760	2012-12-31 00:00:00	-11.1	-14.4	77	26	25.0	101.51	Cloudy

415 rows × 8 columns

In [123]:

```python
#What is the mean value of each column against each weather condition.
df.groupby("Weather").mean()
```

```
C:\Users\DELL\AppData\Local\Temp\ipykernel_19220\3697248356.py:2: FutureWarning: The default value of numeric_only
in DataFrameGroupBy.mean is deprecated. In a future version, numeric_only will default to False. Either specify num
eric_only or select only columns which should be valid for the function.
  df.groupby("Weather").mean()
```

In [123]:

```python
#What is the mean value of each column against each weather condition.
df.groupby("Weather").mean()
```

```
C:\Users\DELL\AppData\Local\Temp\ipykernel_19220\3697248356.py:2: FutureWarning: The default value of numeric_only
in DataFrameGroupBy.mean is deprecated. In a future version, numeric_only will default to False. Either specify num
eric_only or select only columns which should be valid for the function.
  df.groupby("Weather").mean()
```

Out[123]:

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	101.587443
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

In [124]:

```python
#What is the max and min value of each column against each weather condition.
df.groupby("Weather").max()
```

In [124]:

```python
#What is the max and min value of each column against each weather condition.
df.groupby("Weather").max()
```

Out[124]:

Weather	Date/Time	Temp_C	Dew Point Temp_C	Rel Hum_%	Wind Speed_km/h	Visibility_km	Press_kPa
Clear	2012-12-30 20:00:00	32.8	20.4	99	33	48.3	103.63
Cloudy	2012-12-31 06:00:00	30.5	22.6	99	54	48.3	103.65
Drizzle	2012-12-22 01:00:00	18.8	17.7	96	30	25.0	101.56
Drizzle,Fog	2012-12-19 10:00:00	19.9	19.1	100	28	9.7	102.07
Drizzle,Ice Pellets,Fog	2012-12-17 09:00:00	0.4	-0.7	92	20	4.0	100.79
Drizzle,Snow	2012-12-19 18:00:00	1.2	0.2	95	19	11.3	101.15
Drizzle,Snow,Fog	2012-12-22 03:00:00	1.1	0.6	98	32	9.7	100.15
Fog	2012-12-29 10:00:00	20.8	19.6	100	22	9.7	103.04
Freezing Drizzle	2012-12-17 00:00:00	-2.3	-3.3	93	26	12.9	101.02
Freezing Drizzle,Fog	2012-12-10 05:00:00	-0.3	-2.3	94	33	8.0	101.27
Freezing Drizzle,Haze	2012-02-01 13:00:00	-5.0	-7.7	83	11	4.0	100.36
Freezing Drizzle,Snow	2012-12-28 02:00:00	-3.3	-4.6	94	24	12.9	101.18
Freezing Fog	2012-03-17 06:00:00	-0.1	-0.3	99	9	0.8	102.85
Freezing Rain	2012-12-17 02:00:00	0.3	-1.7	92	28	16.1	101.00
Freezing Rain,Fog	2012-12-17 01:00:00	0.1	-0.9	93	26	9.7	101.01
Freezing Rain,Haze	2012-02-01 15:00:00	-4.9	-7.4	83	9	2.8	100.41
Freezing Rain,Ice Pellets,Fog	2012-12-17 03:00:00	-2.6	-3.7	92	28	8.0	100.95
Freezing Rain,Snow Grains	2012-01-13 09:00:00	-5.0	-7.3	84	32	4.8	98.56
Haze	2012-12-13 12:00:00	14.1	11.1	86	17	9.7	102.97
Mainly Clear	2012-12-30 22:00:00	33.0	21.2	99	63	48.3	103.59
Moderate Rain,Fog	2012-12-10 08:00:00	1.7	0.8	94	17	6.4	99.98
Moderate Snow	2012-12-27 09:00:00	-4.9	-6.7	93	39	0.8	100.67
Moderate Snow,Blowing Snow	2012-12-27 12:00:00	-5.4	-6.4	93	41	0.6	100.64
Mostly Cloudy	2012-12-31 03:00:00	32.4	24.4	100	83	48.3	103.65
Rain	2012-12-21 21:00:00	22.8	20.4	99	52	48.3	102.26
Rain Showers	2012-12-14 11:00:00	26.4	23.0	97	41	48.3	102.31
Rain Showers,Fog	2012-10-20 03:00:00	12.8	12.1	96	13	6.4	99.83
Rain Showers,Snow Showers	2012-12-05 10:00:00	2.2	-1.2	78	28	24.1	101.11
Rain,Fog	2012-12-10 17:00:00	21.7	19.5	100	46	9.7	101.77
Rain,Haze	2012-03-13 09:00:00	5.5	2.9	86	17	9.7	100.61
Rain,Ice Pellets	2012-12-18 05:00:00	0.6	-0.6	92	24	9.7	100.12
Rain,Snow	2012-12-21 09:00:00	1.7	0.5	94	52	25.0	101.07
Rain,Snow Grains	2012-12-21 00:00:00	1.9	-2.1	75	26	25.0	100.60
Rain,Snow,Fog	2012-12-08 21:00:00	0.8	0.3	96	9	6.4	100.73

Weather	Date/Time	Temp_C	Dew Point Temp_C	Rel Hum_%	Wind Speed_km/h	Visibility_km	Press_kPa
Rain,Snow,Ice Pellets	2012-12-21 05:00:00	1.3	0.1	94	28	6.4	100.47
Snow	2012-12-31 23:00:00	3.7	0.3	96	57	25.0	102.73
Snow Pellets	2012-11-24 15:00:00	0.7	-6.4	59	35	2.4	99.70
Snow Showers	2012-12-31 08:00:00	2.9	-0.7	94	37	48.3	102.50
Snow Showers,Fog	2012-12-29 13:00:00	-10.0	-11.1	92	22	9.7	102.52
Snow,Blowing Snow	2012-12-27 19:00:00	-1.4	-2.9	91	48	9.7	100.62
Snow,Fog	2012-12-31 10:00:00	1.1	0.8	99	35	9.7	102.07
Snow,Haze	2012-02-01 21:00:00	-3.6	-6.4	81	15	6.4	100.99
Snow,Ice Pellets	2012-12-17 06:00:00	0.8	-1.7	92	33	11.3	100.96
Thunderstorms	2012-07-16 01:00:00	26.7	20.1	87	15	25.0	100.62
Thunderstorms,Heavy Rain Showers	2012-05-29 06:00:00	10.9	9.0	88	9	2.4	100.26
Thunderstorms,Moderate Rain Showers,Fog	2012-07-17 06:00:00	19.6	18.5	93	15	3.2	100.01
Thunderstorms,Rain	2012-07-23 18:00:00	21.3	19.1	93	30	24.1	100.83
Thunderstorms,Rain Showers	2012-09-14 20:00:00	25.5	23.1	98	32	25.0	101.06
Thunderstorms,Rain Showers,Fog	2012-07-31 20:00:00	22.9	21.3	91	35	9.7	100.64
Thunderstorms,Rain,Fog	2012-07-17 05:00:00	20.6	18.6	88	19	4.8	100.08

In [125]:

```python
df.groupby("Weather").min()
```

Out[125]:

Weather	Date/Time	Temp_C	Dew Point Temp_C	Rel Hum_%	Wind Speed_km/h	Visibility_km	Press_kPa
Clear	2012-01-03 19:00:00	-23.3	-28.5	20	0	11.3	99.52
Cloudy	2012-01-01 17:00:00	-21.4	-26.8	18	0	11.3	98.39
Drizzle	2012-01-23 21:00:00	1.1	-0.2	74	0	6.4	97.84
Drizzle,Fog	2012-01-23 20:00:00	0.0	-1.6	85	0	1.0	98.65
Drizzle,Ice Pellets,Fog	2012-12-17 09:00:00	0.4	-0.7	92	20	4.0	100.79
Drizzle,Snow	2012-12-17 15:00:00	0.9	0.1	92	9	9.7	100.63
Drizzle,Snow,Fog	2012-12-18 21:00:00	0.3	-0.1	92	7	2.4	97.79
Fog	2012-01-01 00:00:00	-16.0	-17.2	80	0	0.2	98.31
Freezing Drizzle	2012-01-07 11:00:00	-9.0	-12.2	78	6	4.8	98.44
Freezing Drizzle,Fog	2012-01-01 02:00:00	-6.4	-9.0	82	6	3.6	98.74
Freezing Drizzle,Haze	2012-02-01 11:00:00	-5.8	-8.3	81	9	2.0	100.28
Freezing Drizzle,Snow	2012-01-13 03:00:00	-8.3	-10.4	79	6	2.4	99.19
Freezing Fog	2012-01-22 06:00:00	-19.0	-22.9	71	0	0.2	101.97
Freezing Rain	2012-01-07 10:00:00	-6.5	-9.0	81	7	2.8	98.22
Freezing Rain,Fog	2012-01-07 09:00:00	-6.1	-8.7	82	7	2.8	98.32
Freezing Rain,Haze	2012-02-01 14:00:00	-4.9	-7.5	82	6	2.0	100.34
Freezing Rain,Ice Pellets,Fog	2012-12-17 03:00:00	-2.6	-3.7	92	28	8.0	100.95
Freezing Rain,Snow Grains	2012-01-13 09:00:00	-5.0	-7.3	84	32	4.8	98.56
Haze	2012-01-22 12:00:00	-11.5	-16.0	68	0	4.8	100.35
Mainly Clear	2012-01-02 12:00:00	-22.8	-28.0	20	0	12.9	98.67
Moderate Rain,Fog	2012-12-10 08:00:00	1.7	0.8	94	17	6.4	99.98
Moderate Snow	2012-01-12 15:00:00	-6.3	-7.6	83	26	0.6	99.88
Moderate Snow,Blowing Snow	2012-12-27 10:00:00	-5.5	-6.6	92	39	0.6	100.50
Mostly Cloudy	2012-01-01 16:00:00	-23.2	-28.5	18	0	11.3	98.36
Rain	2012-01-01 18:00:00	0.3	-5.7	40	0	4.0	97.52
Rain Showers	2012-01-01 22:00:00	1.6	-7.2	37	0	6.4	98.51
Rain Showers,Fog	2012-10-20 03:00:00	12.8	12.1	96	13	6.4	99.83
Rain Showers,Snow Showers	2012-11-04 08:00:00	2.1	-1.8	75	17	19.3	101.09
Rain,Fog	2012-01-23 18:00:00	0.0	-1.2	83	0	2.0	98.61
Rain,Haze	2012-03-13 07:00:00	4.0	1.0	81	7	4.0	100.50
Rain,Ice Pellets	2012-12-18 05:00:00	0.6	-0.6	92	24	9.7	100.12
Rain,Snow	2012-01-10 05:00:00	0.6	-1.7	81	13	2.4	98.18
Rain,Snow Grains	2012-12-21 00:00:00	1.9	-2.1	75	26	25.0	100.60
Rain,Snow,Fog	2012-12-08 21:00:00	0.8	0.3	96	9	6.4	100.73

Weather	Date/Time	Temp_C	Dew Point Temp_C	Rel Hum_%	Wind Speed_km/h	Visibility_km	Press_kPa
Rain,Snow,Ice Pellets	2012-12-21 01:00:00	0.9	-0.7	88	17	4.8	99.85
Snow	2012-01-03 07:00:00	-16.7	-24.6	41	0	1.0	97.75
Snow Pellets	2012-11-24 15:00:00	0.7	-6.4	59	35	2.4	99.70
Snow Showers	2012-01-02 17:00:00	-13.3	-19.3	52	0	2.4	99.49
Snow Showers,Fog	2012-12-26 09:00:00	-11.3	-12.7	89	7	4.0	100.63
Snow,Blowing Snow	2012-01-13 21:00:00	-12.0	-16.2	70	24	0.6	98.11
Snow,Fog	2012-02-10 23:00:00	-10.1	-12.0	77	4	1.2	99.38
Snow,Haze	2012-02-01 17:00:00	-4.3	-7.2	80	0	4.0	100.61
Snow,Ice Pellets	2012-03-03 04:00:00	-4.3	-5.9	76	19	2.8	99.40
Thunderstorms	2012-07-04 16:00:00	21.6	19.4	67	0	24.1	99.84
Thunderstorms,Heavy Rain Showers	2012-05-29 06:00:00	10.9	9.0	88	9	2.4	100.26
Thunderstorms,Moderate Rain Showers,Fog	2012-07-17 06:00:00	19.6	18.5	93	15	3.2	100.01
Thunderstorms,Rain	2012-05-25 20:00:00	19.4	18.2	83	4	16.1	100.19
Thunderstorms,Rain Showers	2012-05-29 04:00:00	11.0	7.0	68	7	6.4	99.65
Thunderstorms,Rain Showers,Fog	2012-06-29 03:00:00	19.5	16.1	80	7	9.7	99.71
Thunderstorms,Rain,Fog	2012-07-17 05:00:00	20.6	18.6	88	19	4.8	100.08

In [127]:

```
#Show all conditions where weather is fog
df[df["Weather"]=="Fog"]
```

Out[127]:

	Date/Time	Temp_C	Dew Point Temp_C	Rel Hum_%	Wind Speed_km/h	Visibility_km	Press_kPa	Weather
0	2012-01-01 00:00:00	-1.8	-3.9	86	4	8.0	101.24	Fog
1	2012-01-01 01:00:00	-1.8	-3.7	87	4	8.0	101.24	Fog
4	2012-01-01 04:00:00	-1.5	-3.3	88	7	4.8	101.23	Fog
5	2012-01-01 05:00:00	-1.4	-3.3	87	9	6.4	101.27	Fog
6	2012-01-01 06:00:00	-1.5	-3.1	89	7	6.4	101.29	Fog
...	...	...	...	...	...	...	...	...
8716	2012-12-29 04:00:00	-16.0	-17.2	90	6	9.7	101.25	Fog
8717	2012-12-29 05:00:00	-14.8	-15.9	91	4	6.4	101.25	Fog
8718	2012-12-29 06:00:00	-13.8	-15.3	88	4	9.7	101.25	Fog
8719	2012-12-29 07:00:00	-14.8	-16.4	88	7	8.0	101.22	Fog
8722	2012-12-29 10:00:00	-12.0	-13.3	90	7	6.4	101.15	Fog

150 rows × 8 columns

In [128]:

```
#Find the all instance where weather is clear or visbilty is above 40
df[(df["Weather"]=="Clear")|(df["Visibility_km"]>40)]
```

Out[128]:

	Date/Time	Temp_C	Dew Point Temp_C	Rel Hum_%	Wind Speed_km/h	Visibility_km	Press_kPa	Weather
67	2012-01-03 19:00:00	-16.9	-24.8	50	24	25.0	101.74	Clear
106	2012-01-05 10:00:00	-6.0	-10.0	73	17	48.3	100.45	Mainly Clear
107	2012-01-05 11:00:00	-5.6	-10.2	70	22	48.3	100.41	Mainly Clear
108	2012-01-05 12:00:00	-4.7	-9.6	69	20	48.3	100.38	Mainly Clear
109	2012-01-05 13:00:00	-4.4	-9.7	66	26	48.3	100.40	Mainly Clear
...	...	...	...	...	...	...	...	...
8749	2012-12-30 13:00:00	-12.4	-16.2	73	37	48.3	100.92	Mostly Cloudy
8750	2012-12-30 14:00:00	-11.8	-16.1	70	37	48.3	100.96	Mainly Clear
8751	2012-12-30 15:00:00	-11.3	-15.6	70	32	48.3	101.05	Mainly Clear
8752	2012-12-30 16:00:00	-11.4	-15.5	72	26	48.3	101.15	Mainly Clear
8756	2012-12-30 20:00:00	-13.8	-16.5	80	24	25.0	101.52	Clear

3027 rows × 8 columns

In [129]:

```
#Find all instance where
#Weather is clear and humdity is above 50 or
#visbilty is above 40
df[((df["Weather"]=="Clear") & df["Rel Hum_%"]>50)|(df["Visibility_km"]>40)]
```

Out[129]:

	Date/Time	Temp_C	Dew Point Temp_C	Rel Hum_%	Wind Speed_km/h	Visibility_km	Press_kPa	Weather
106	2012-01-05 10:00:00	-6.0	-10.0	73	17	48.3	100.45	Mainly Clear
107	2012-01-05 11:00:00	-5.6	-10.2	70	22	48.3	100.41	Mainly Clear
108	2012-01-05 12:00:00	-4.7	-9.6	69	20	48.3	100.38	Mainly Clear
109	2012-01-05 13:00:00	-4.4	-9.7	66	26	48.3	100.40	Mainly Clear
110	2012-01-05 14:00:00	-5.1	-10.7	65	22	48.3	100.46	Mainly Clear
...	...	...	...	...	...	...	...	...
8748	2012-12-30 12:00:00	-12.2	-15.7	75	26	48.3	100.91	Mostly Cloudy
8749	2012-12-30 13:00:00	-12.4	-16.2	73	37	48.3	100.92	Mostly Cloudy
8750	2012-12-30 14:00:00	-11.8	-16.1	70	37	48.3	100.96	Mainly Clear
8751	2012-12-30 15:00:00	-11.3	-15.6	70	32	48.3	101.05	Mainly Clear
8752	2012-12-30 16:00:00	-11.4	-15.5	72	26	48.3	101.15	Mainly Clear

2014 rows × 8 columns

In [ ]: