

# Working On Real Project With Python

## Weather Dataset

Here weather dataset is a time series data with per hour information about the weather condition at a particular location. It records Temperature, Dew point temperature, relative humidity, wind speed, visibility, Pressure and Conditions

The data is available in csv file. We are going to analyse the dataset using python pandas dataframe

```
import pandas as pd

#reading the csv file
data=pd.read_csv('file.csv')

#checking the data
data
```

|      | Date/Time        | Temp_C    | Dew Point Temp_C | Rel Hum_% | Wind Speed_km/h |
|------|------------------|-----------|------------------|-----------|-----------------|
| 0    | 1/1/2012 0:00    | -1.8      | -3.9             | 86        |                 |
| 4    |                  |           |                  |           |                 |
| 1    | 1/1/2012 1:00    | -1.8      | -3.7             | 87        |                 |
| 4    |                  |           |                  |           |                 |
| 2    | 1/1/2012 2:00    | -1.8      | -3.4             | 89        |                 |
| 7    |                  |           |                  |           |                 |
| 3    | 1/1/2012 3:00    | -1.5      | -3.2             | 88        |                 |
| 6    |                  |           |                  |           |                 |
| 4    | 1/1/2012 4:00    | -1.5      | -3.3             | 88        |                 |
| 7    |                  |           |                  |           |                 |
| ...  | ...              | ...       | ...              | ...       | ...             |
| ...  |                  |           |                  |           |                 |
| 8779 | 12/31/2012 19:00 | 0.1       | -2.7             | 81        |                 |
| 30   |                  |           |                  |           |                 |
| 8780 | 12/31/2012 20:00 | 0.2       | -2.4             | 83        |                 |
| 24   |                  |           |                  |           |                 |
| 8781 | 12/31/2012 21:00 | -0.5      | -1.5             | 93        |                 |
| 28   |                  |           |                  |           |                 |
| 8782 | 12/31/2012 22:00 | -0.2      | -1.8             | 89        |                 |
| 28   |                  |           |                  |           |                 |
| 8783 | 12/31/2012 23:00 | 0.0       | -2.1             | 86        |                 |
| 30   |                  |           |                  |           |                 |
|      | 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    9.7      100.13      Snow
8780    9.7      100.03      Snow
8781    4.8       99.95      Snow
8782    9.7       99.91      Snow
8783   11.3       99.89      Snow

```

```
[8784 rows x 8 columns]
```

## How to Analyze the DataFrame

### .head()

It shows the first N rows of the dataset. (by default N=5)

```
data.head()
```

```

      Date/Time  Temp_C  Dew Point Temp_C  Rel Hum_%  Wind Speed_km/h
\
0  1/1/2012 0:00   -1.8          -3.9      86          4
1  1/1/2012 1:00   -1.8          -3.7      87          4
2  1/1/2012 2:00   -1.8          -3.4      89          7
3  1/1/2012 3:00   -1.5          -3.2      88          6
4  1/1/2012 4:00   -1.5          -3.3      88          7

```

```

      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

```

```
data.head(10)
```

```

      Date/Time  Temp_C  Dew Point Temp_C  Rel Hum_%  Wind Speed_km/h
\
0  1/1/2012 0:00   -1.8          -3.9      86          4

```

|   |               |      |      |    |    |
|---|---------------|------|------|----|----|
| 1 | 1/1/2012 1:00 | -1.8 | -3.7 | 87 | 4  |
| 2 | 1/1/2012 2:00 | -1.8 | -3.4 | 89 | 7  |
| 3 | 1/1/2012 3:00 | -1.5 | -3.2 | 88 | 6  |
| 4 | 1/1/2012 4:00 | -1.5 | -3.3 | 88 | 7  |
| 5 | 1/1/2012 5:00 | -1.4 | -3.3 | 87 | 9  |
| 6 | 1/1/2012 6:00 | -1.5 | -3.1 | 89 | 7  |
| 7 | 1/1/2012 7:00 | -1.4 | -3.6 | 85 | 7  |
| 8 | 1/1/2012 8:00 | -1.4 | -3.6 | 85 | 9  |
| 9 | 1/1/2012 9:00 | -1.3 | -3.1 | 88 | 15 |

|   | 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                  |
| 5 | 6.4           | 101.27    | Fog                  |
| 6 | 6.4           | 101.29    | Fog                  |
| 7 | 8.0           | 101.26    | Fog                  |
| 8 | 8.0           | 101.23    | Fog                  |
| 9 | 4.0           | 101.20    | Fog                  |

## .shape

It shows total number of rows and columns

```
data.shape
(8784, 8)
```

## .index

This attributes provide the index of the dataframe

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

## .columns

It shows all names of the columns

```
data.columns  
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 datatypes to each columns

```
data.dtypes  
  
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()

This command is applied only on single column not whole dataframe. In the columns it provide all unique values.

```
data['Weather'].unique()  
  
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 total number of unique values in each columns. It can be applied on one column or also on whole dataframe

```

#whole dataframe
data.nunique()

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

#on single column
data['Weather'].nunique()

50

```

## .count

It shows total number of non null values in each columns. It also can be applied on whole dataframe as well as each columns

```

#whole dataframe
data.count()

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

#on column
data['Weather'].count()

8784

```

## .value\_counts

It shows all the unique value with their count in a column. Applied only on one column at a time

```

data['Weather'].value_counts()

```

|                            |      |
|----------------------------|------|
| 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 the data

```
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
```

# Analysis Report

Q1-> Find all the unique "Wind Speed" values in the dataset.

```
#check all dataframe
```

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

|   | Date/Time     | Temp_C | Dew Point Temp_C | Rel Hum_% | Wind Speed_km/h |
|---|---------------|--------|------------------|-----------|-----------------|
| 0 | 1/1/2012 0:00 | -1.8   | -3.9             | 86        | 4               |
| 1 | 1/1/2012 1:00 | -1.8   | -3.7             | 87        | 4               |

|   | Visibility_km | Press_kPa | Weather |
|---|---------------|-----------|---------|
| 0 | 8.0           | 101.24    | Fog     |
| 1 | 8.0           | 101.24    | Fog     |

```
#we can check it from whole dataframe
```

```
data.nunique()
```

```
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
```

```
#or we can check directly in the column
```

```
data['Wind Speed_km/h'].nunique()
```

```
34
```

```
#to show all the unique values
```

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

```
#Answer
```

```
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)
```



Q2-> Find the number of times when the "Weather is exactly Clear" present.

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

|   | Date/Time     | Temp_C | Dew Point Temp_C | Rel Hum_% | Wind Speed_km/h |
|---|---------------|--------|------------------|-----------|-----------------|
| 0 | 1/1/2012 0:00 | -1.8   | -3.9             | 86        | 4               |
| 1 | 1/1/2012 1:00 | -1.8   | -3.7             | 87        | 4               |

|   | Visibility_km | Press_kPa | Weather |
|---|---------------|-----------|---------|
| 0 | 8.0           | 101.24    | Fog     |
| 1 | 8.0           | 101.24    | Fog     |

```
#using value_count()
```

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

|                            |      |
|----------------------------|------|
| 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

Clearly 1326 is the answer

*#second way is to use filtering*

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

```
0      False
1      False
2      False
3      False
4      False
```

```
...
8779   False
8780   False
8781   False
8782   False
8783   False
```

Name: Weather, Length: 8784, dtype: bool

*#it is giving bool values so to get required answer*

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

|              | Date/Time      | Temp_C | Dew Point | Temp_C | Rel Hum_% | Wind |
|--------------|----------------|--------|-----------|--------|-----------|------|
| Speed_km/h \ |                |        |           |        |           |      |
| 67           | 1/3/2012 19:00 | -16.9  |           | -24.8  | 50        |      |
| 24           |                |        |           |        |           |      |
| 114          | 1/5/2012 18:00 | -7.1   |           | -14.4  | 56        |      |
| 11           |                |        |           |        |           |      |
| 115          | 1/5/2012 19:00 | -9.2   |           | -15.4  | 61        |      |
| 7            |                |        |           |        |           |      |

|      |                  |       |       |     |
|------|------------------|-------|-------|-----|
| 116  | 1/5/2012 20:00   | -9.8  | -15.7 | 62  |
| 9    |                  |       |       |     |
| 117  | 1/5/2012 21:00   | -9.0  | -14.8 | 63  |
| 13   |                  |       |       |     |
| ...  | ...              | ...   | ...   | ... |
| ...  |                  |       |       |     |
| 8646 | 12/26/2012 6:00  | -13.4 | -14.8 | 89  |
| 4    |                  |       |       |     |
| 8698 | 12/28/2012 10:00 | -6.1  | -8.6  | 82  |
| 19   |                  |       |       |     |
| 8713 | 12/29/2012 1:00  | -11.9 | -13.6 | 87  |
| 11   |                  |       |       |     |
| 8714 | 12/29/2012 2:00  | -11.8 | -13.1 | 90  |
| 13   |                  |       |       |     |
| 8756 | 12/30/2012 20:00 | -13.8 | -16.5 | 80  |
| 24   |                  |       |       |     |

|      | Visibility_km | Press_kPa | Weather |
|------|---------------|-----------|---------|
| 67   | 25.0          | 101.74    | Clear   |
| 114  | 25.0          | 100.71    | Clear   |
| 115  | 25.0          | 100.80    | Clear   |
| 116  | 25.0          | 100.83    | Clear   |
| 117  | 25.0          | 100.83    | Clear   |
| ...  | ...           | ...       | ...     |
| 8646 | 25.0          | 102.47    | Clear   |
| 8698 | 24.1          | 101.27    | Clear   |
| 8713 | 25.0          | 101.31    | Clear   |
| 8714 | 25.0          | 101.33    | Clear   |
| 8756 | 25.0          | 101.52    | Clear   |

[1326 rows x 8 columns]

Here also we have 1326 as answer

```
#groupby
data.groupby('Weather').get_group('Clear')    #first column-> then
what we are checking
```

|     | Date/Time      | Temp_C | Dew Point Temp_C | Rel Hum_% | Wind Speed_km/h |
|-----|----------------|--------|------------------|-----------|-----------------|
| 67  | 1/3/2012 19:00 | -16.9  | -24.8            | 50        |                 |
| 24  |                |        |                  |           |                 |
| 114 | 1/5/2012 18:00 | -7.1   | -14.4            | 56        |                 |
| 11  |                |        |                  |           |                 |
| 115 | 1/5/2012 19:00 | -9.2   | -15.4            | 61        |                 |
| 7   |                |        |                  |           |                 |
| 116 | 1/5/2012 20:00 | -9.8   | -15.7            | 62        |                 |
| 9   |                |        |                  |           |                 |
| 117 | 1/5/2012 21:00 | -9.0   | -14.8            | 63        |                 |

```

13
...      ...      ...      ...      ...
...
8646  12/26/2012  6:00  -13.4      -14.8      89
4
8698  12/28/2012  10:00  -6.1      -8.6      82
19
8713  12/29/2012  1:00  -11.9     -13.6      87
11
8714  12/29/2012  2:00  -11.8     -13.1      90
13
8756  12/30/2012  20:00  -13.8     -16.5      80
24

```

|      | Visibility_km | Press_kPa | Weather |
|------|---------------|-----------|---------|
| 67   | 25.0          | 101.74    | Clear   |
| 114  | 25.0          | 100.71    | Clear   |
| 115  | 25.0          | 100.80    | Clear   |
| 116  | 25.0          | 100.83    | Clear   |
| 117  | 25.0          | 100.83    | Clear   |
| ...  | ...           | ...       | ...     |
| 8646 | 25.0          | 102.47    | Clear   |
| 8698 | 24.1          | 101.27    | Clear   |
| 8713 | 25.0          | 101.31    | Clear   |
| 8714 | 25.0          | 101.33    | Clear   |
| 8756 | 25.0          | 101.52    | Clear   |

```
[1326 rows x 8 columns]
```

So the answer is 1326

Q3-> Find the number of times when the "Wind Speed is exactly 4 km/h".

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

|   | Date/Time     | Temp_C | Dew Point | Temp_C | Rel Hum_% | Wind Speed_km/h |
|---|---------------|--------|-----------|--------|-----------|-----------------|
| 0 | 1/1/2012 0:00 | -1.8   |           | -3.9   | 86        | 4               |
| 1 | 1/1/2012 1:00 | -1.8   |           | -3.7   | 87        | 4               |

|   | Visibility_km | Press_kPa | Weather |
|---|---------------|-----------|---------|
| 0 | 8.0           | 101.24    | Fog     |
| 1 | 8.0           | 101.24    | Fog     |

*#will use filtering*

```
data[data['Wind Speed_km/h']==4]
```

|              | Date/Time        | Temp_C    | Dew Point Temp_C | Rel Hum_% | Wind |
|--------------|------------------|-----------|------------------|-----------|------|
| Speed_km/h \ |                  |           |                  |           |      |
| 0            | 1/1/2012 0:00    | -1.8      | -3.9             | 86        |      |
| 4            |                  |           |                  |           |      |
| 1            | 1/1/2012 1:00    | -1.8      | -3.7             | 87        |      |
| 4            |                  |           |                  |           |      |
| 96           | 1/5/2012 0:00    | -8.8      | -11.7            | 79        |      |
| 4            |                  |           |                  |           |      |
| 101          | 1/5/2012 5:00    | -7.0      | -9.5             | 82        |      |
| 4            |                  |           |                  |           |      |
| 146          | 1/7/2012 2:00    | -8.1      | -11.1            | 79        |      |
| 4            |                  |           |                  |           |      |
| ...          | ...              | ...       | ...              | ...       |      |
| ...          |                  |           |                  |           |      |
| 8768         | 12/31/2012 8:00  | -8.6      | -10.3            | 87        |      |
| 4            |                  |           |                  |           |      |
| 8769         | 12/31/2012 9:00  | -8.1      | -9.6             | 89        |      |
| 4            |                  |           |                  |           |      |
| 8770         | 12/31/2012 10:00 | -7.4      | -8.9             | 89        |      |
| 4            |                  |           |                  |           |      |
| 8772         | 12/31/2012 12:00 | -5.8      | -7.5             | 88        |      |
| 4            |                  |           |                  |           |      |
| 8773         | 12/31/2012 13:00 | -4.6      | -6.6             | 86        |      |
| 4            |                  |           |                  |           |      |
|              | Visibility_km    | Press_kPa | Weather          |           |      |
| 0            | 8.0              | 101.24    | Fog              |           |      |
| 1            | 8.0              | 101.24    | Fog              |           |      |
| 96           | 9.7              | 100.32    | Snow             |           |      |
| 101          | 4.0              | 100.19    | Snow             |           |      |
| 146          | 19.3             | 100.15    | Cloudy           |           |      |
| ...          | ...              | ...       | ...              |           |      |
| 8768         | 3.2              | 101.14    | Snow Showers     |           |      |
| 8769         | 2.4              | 101.09    | Snow             |           |      |
| 8770         | 6.4              | 101.05    | Snow, Fog        |           |      |
| 8772         | 12.9             | 100.78    | Snow             |           |      |
| 8773         | 12.9             | 100.63    | Snow             |           |      |

[474 rows x 8 columns]

474 is the answer

```
#or you may use value_counts
data['Wind Speed_km/h'].value_counts()

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

```

Here also 474 is answer

```

#groupby
data.groupby('Wind Speed_km/h').get_group(4)

```

|              | Date/Time     | Temp_C | Dew Point Temp_C | Rel Hum_% | Wind |
|--------------|---------------|--------|------------------|-----------|------|
| Speed_km/h \ |               |        |                  |           |      |
| 0            | 1/1/2012 0:00 | -1.8   | -3.9             | 86        |      |
| 4            |               |        |                  |           |      |
| 1            | 1/1/2012 1:00 | -1.8   | -3.7             | 87        |      |
| 4            |               |        |                  |           |      |
| 96           | 1/5/2012 0:00 | -8.8   | -11.7            | 79        |      |
| 4            |               |        |                  |           |      |
| 101          | 1/5/2012 5:00 | -7.0   | -9.5             | 82        |      |
| 4            |               |        |                  |           |      |
| 146          | 1/7/2012 2:00 | -8.1   | -11.1            | 79        |      |
| 4            |               |        |                  |           |      |

```

...
...
8768 12/31/2012 8:00 -8.6 -10.3 87
4
8769 12/31/2012 9:00 -8.1 -9.6 89
4
8770 12/31/2012 10:00 -7.4 -8.9 89
4
8772 12/31/2012 12:00 -5.8 -7.5 88
4
8773 12/31/2012 13:00 -4.6 -6.6 86
4

```

```

      Visibility_km  Press_kPa      Weather
0              8.0    101.24      Fog
1              8.0    101.24      Fog
96             9.7    100.32      Snow
101            4.0    100.19      Snow
146           19.3    100.15    Cloudy
...
8768           3.2    101.14  Snow Showers
8769           2.4    101.09      Snow
8770           6.4    101.05  Snow, Fog
8772          12.9    100.78      Snow
8773          12.9    100.63      Snow

```

[474 rows x 8 columns]

Q4-> Find out all Null value in the data.

```

#using null function in whole dataframe
data.isnull()

```

```

      Date/Time  Temp_C  Dew Point Temp_C  Rel Hum_%  Wind Speed_km/h
\
0      False    False          False    False          False
1      False    False          False    False          False
2      False    False          False    False          False
3      False    False          False    False          False
4      False    False          False    False          False
...
8779    False    False          False    False          False
8780    False    False          False    False          False

```

|      |       |       |       |       |       |
|------|-------|-------|-------|-------|-------|
| 8781 | False | False | False | False | False |
| 8782 | False | False | False | False | False |
| 8783 | False | False | False | False | False |

|      | Visibility_km | Press_kPa | Weather |
|------|---------------|-----------|---------|
| 0    | False         | False     | False   |
| 1    | False         | False     | False   |
| 2    | False         | False     | False   |
| 3    | False         | False     | False   |
| 4    | False         | False     | False   |
| ...  | ...           | ...       | ...     |
| 8779 | False         | False     | False   |
| 8780 | False         | False     | False   |
| 8781 | False         | False     | False   |
| 8782 | False         | False     | False   |
| 8783 | False         | False     | False   |

[8784 rows x 8 columns]

```
#we don't need bool values
data.isnull().sum()
```

```
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
```

There is no null values

```
#another function to perform same operation
data.notnull()
```

|   | Date/Time | Temp_C | Dew Point Temp_C | Rel Hum_% | Wind Speed_km/h |
|---|-----------|--------|------------------|-----------|-----------------|
| 0 | True      | True   | True             | True      | True            |
| 1 | True      | True   | True             | True      | True            |
| 2 | True      | True   | True             | True      | True            |
| 3 | True      | True   | True             | True      | True            |



|      |      |      |      |      |      |
|------|------|------|------|------|------|
| 4    | True | True | True | True | True |
| ...  | ...  | ...  | ...  | ...  | ...  |
| 8779 | True | True | True | True | True |
| 8780 | True | True | True | True | True |
| 8781 | True | True | True | True | True |
| 8782 | True | True | True | True | True |
| 8783 | True | True | True | True | True |

|      | Visibility_km | Press_kPa | Weather |
|------|---------------|-----------|---------|
| 0    | True          | True      | True    |
| 1    | True          | True      | True    |
| 2    | True          | True      | True    |
| 3    | True          | True      | True    |
| 4    | True          | True      | True    |
| ...  | ...           | ...       | ...     |
| 8779 | True          | True      | True    |
| 8780 | True          | True      | True    |
| 8781 | True          | True      | True    |
| 8782 | True          | True      | True    |
| 8783 | True          | True      | True    |

[8784 rows x 8 columns]

data.notnull().sum()

```
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
```

Q5-> Rename the "Weather" column name to "Weather Condntion".

data.head(2)

|   | Date/Time     | Temp_C | Dew Point Temp_C | Rel Hum_% | Wind Speed_km/h |
|---|---------------|--------|------------------|-----------|-----------------|
| 0 | 1/1/2012 0:00 | -1.8   | -3.9             | 86        | 4               |

```
1 1/1/2012 1:00 -1.8 -3.7 87 4
```

```

Visibility_km Press_kPa Weather
0 8.0 101.24 Fog
1 8.0 101.24 Fog

```

```
data.rename(columns={'Weather':'Weather Condntion'}, inplace=True)
```

*#we have used the inplace to save our result itself in the dataframe*  
data

```

Date/Time Temp_C Dew Point Temp_C Rel Hum_% Wind
Speed_km/h \
0 1/1/2012 0:00 -1.8 -3.9 86
4
1 1/1/2012 1:00 -1.8 -3.7 87
4
2 1/1/2012 2:00 -1.8 -3.4 89
7
3 1/1/2012 3:00 -1.5 -3.2 88
6
4 1/1/2012 4:00 -1.5 -3.3 88
7
... ... ... ...
...
8779 12/31/2012 19:00 0.1 -2.7 81
30
8780 12/31/2012 20:00 0.2 -2.4 83
24
8781 12/31/2012 21:00 -0.5 -1.5 93
28
8782 12/31/2012 22:00 -0.2 -1.8 89
28
8783 12/31/2012 23:00 0.0 -2.1 86
30

```

```

Visibility_km Press_kPa Weather Condntion
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 9.7 100.13 Snow
8780 9.7 100.03 Snow
8781 4.8 99.95 Snow
8782 9.7 99.91 Snow
8783 11.3 99.89 Snow

```

[8784 rows x 8 columns]

Q6-> What is the mean of 'Visibility' column?

data

|              | Date/Time        | Temp_C | Dew Point Temp_C | Rel Hum_% | Wind |
|--------------|------------------|--------|------------------|-----------|------|
| Speed_km/h \ |                  |        |                  |           |      |
| 0            | 1/1/2012 0:00    | -1.8   | -3.9             | 86        |      |
| 4            |                  |        |                  |           |      |
| 1            | 1/1/2012 1:00    | -1.8   | -3.7             | 87        |      |
| 4            |                  |        |                  |           |      |
| 2            | 1/1/2012 2:00    | -1.8   | -3.4             | 89        |      |
| 7            |                  |        |                  |           |      |
| 3            | 1/1/2012 3:00    | -1.5   | -3.2             | 88        |      |
| 6            |                  |        |                  |           |      |
| 4            | 1/1/2012 4:00    | -1.5   | -3.3             | 88        |      |
| 7            |                  |        |                  |           |      |
| ...          | ...              | ...    | ...              | ...       |      |
| ...          |                  |        |                  |           |      |
| 8779         | 12/31/2012 19:00 | 0.1    | -2.7             | 81        |      |
| 30           |                  |        |                  |           |      |
| 8780         | 12/31/2012 20:00 | 0.2    | -2.4             | 83        |      |
| 24           |                  |        |                  |           |      |
| 8781         | 12/31/2012 21:00 | -0.5   | -1.5             | 93        |      |
| 28           |                  |        |                  |           |      |
| 8782         | 12/31/2012 22:00 | -0.2   | -1.8             | 89        |      |
| 28           |                  |        |                  |           |      |
| 8783         | 12/31/2012 23:00 | 0.0    | -2.1             | 86        |      |
| 30           |                  |        |                  |           |      |

  

|      | Visibility_km | Press_kPa | Weather           | Condntion |
|------|---------------|-----------|-------------------|-----------|
| 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 | 9.7           | 100.13    |                   | Snow      |
| 8780 | 9.7           | 100.03    |                   | Snow      |
| 8781 | 4.8           | 99.95     |                   | Snow      |
| 8782 | 9.7           | 99.91     |                   | Snow      |
| 8783 | 11.3          | 99.89     |                   | Snow      |

[8784 rows x 8 columns]

```
data['Visibility_km'].mean()
```

27.664446721311478

Q7-> What is the standard deviation of 'Pressure' column in the data?

```
data
```

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

[8784 rows x 8 columns]

```
data['Press_kPa'].std()
```

0.8440047459486483

Q8-> What is the variance of relative humidity in this data?

data

|      | Date/Time        | Temp_C | Dew Point Temp_C | Rel Hum_% | Wind Speed_km/h \ |
|------|------------------|--------|------------------|-----------|-------------------|
| 0    | 1/1/2012 0:00    | -1.8   | -3.9             | 86        |                   |
| 4    |                  |        |                  |           |                   |
| 1    | 1/1/2012 1:00    | -1.8   | -3.7             | 87        |                   |
| 4    |                  |        |                  |           |                   |
| 2    | 1/1/2012 2:00    | -1.8   | -3.4             | 89        |                   |
| 7    |                  |        |                  |           |                   |
| 3    | 1/1/2012 3:00    | -1.5   | -3.2             | 88        |                   |
| 6    |                  |        |                  |           |                   |
| 4    | 1/1/2012 4:00    | -1.5   | -3.3             | 88        |                   |
| 7    |                  |        |                  |           |                   |
| ...  | ...              | ...    | ...              | ...       |                   |
| ...  |                  |        |                  |           |                   |
| 8779 | 12/31/2012 19:00 | 0.1    | -2.7             | 81        |                   |
| 30   |                  |        |                  |           |                   |
| 8780 | 12/31/2012 20:00 | 0.2    | -2.4             | 83        |                   |
| 24   |                  |        |                  |           |                   |
| 8781 | 12/31/2012 21:00 | -0.5   | -1.5             | 93        |                   |
| 28   |                  |        |                  |           |                   |
| 8782 | 12/31/2012 22:00 | -0.2   | -1.8             | 89        |                   |
| 28   |                  |        |                  |           |                   |
| 8783 | 12/31/2012 23:00 | 0.0    | -2.1             | 86        |                   |
| 30   |                  |        |                  |           |                   |

|      | Visibility_km | Press_kPa | Weather           | Condtion |
|------|---------------|-----------|-------------------|----------|
| 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 | 9.7           | 100.13    |                   | Snow     |
| 8780 | 9.7           | 100.03    |                   | Snow     |
| 8781 | 4.8           | 99.95     |                   | Snow     |
| 8782 | 9.7           | 99.91     |                   | Snow     |
| 8783 | 11.3          | 99.89     |                   | Snow     |

[8784 rows x 8 columns]

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

286.24855019850196

Q9-> Find all instances when "snow" was recorded?

```
#using value_count
```

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

|   |      |
|---|------|
| 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 Condtion, dtype: int64
```

390 is our required answer

*#filtering*

```
data[data['Weather Condtion']=='Snow']
```

|              | Date/Time        | Temp_C | Dew Point | Temp_C | Rel Hum_% | Wind |
|--------------|------------------|--------|-----------|--------|-----------|------|
| Speed_km/h \ |                  |        |           |        |           |      |
| 55           | 1/3/2012 7:00    | -14.0  |           | -19.5  | 63        |      |
| 19           |                  |        |           |        |           |      |
| 84           | 1/4/2012 12:00   | -13.7  |           | -21.7  | 51        |      |
| 11           |                  |        |           |        |           |      |
| 86           | 1/4/2012 14:00   | -11.3  |           | -19.0  | 53        |      |
| 7            |                  |        |           |        |           |      |
| 87           | 1/4/2012 15:00   | -10.2  |           | -16.3  | 61        |      |
| 11           |                  |        |           |        |           |      |
| 88           | 1/4/2012 16:00   | -9.4   |           | -15.5  | 61        |      |
| 13           |                  |        |           |        |           |      |
| ...          | ...              | ...    |           | ...    | ...       |      |
| ...          |                  |        |           |        |           |      |
| 8779         | 12/31/2012 19:00 | 0.1    |           | -2.7   | 81        |      |
| 30           |                  |        |           |        |           |      |
| 8780         | 12/31/2012 20:00 | 0.2    |           | -2.4   | 83        |      |
| 24           |                  |        |           |        |           |      |
| 8781         | 12/31/2012 21:00 | -0.5   |           | -1.5   | 93        |      |
| 28           |                  |        |           |        |           |      |
| 8782         | 12/31/2012 22:00 | -0.2   |           | -1.8   | 89        |      |
| 28           |                  |        |           |        |           |      |
| 8783         | 12/31/2012 23:00 | 0.0    |           | -2.1   | 86        |      |
| 30           |                  |        |           |        |           |      |

|      | Visibility_km | Press_kPa | Weather Condtion |
|------|---------------|-----------|------------------|
| 55   | 25.0          | 100.95    | Snow             |
| 84   | 24.1          | 101.25    | Snow             |
| 86   | 19.3          | 100.97    | Snow             |
| 87   | 9.7           | 100.89    | Snow             |
| 88   | 19.3          | 100.79    | Snow             |
| ...  | ...           | ...       | ...              |
| 8779 | 9.7           | 100.13    | Snow             |
| 8780 | 9.7           | 100.03    | Snow             |
| 8781 | 4.8           | 99.95     | Snow             |
| 8782 | 9.7           | 99.91     | Snow             |
| 8783 | 11.3          | 99.89     | Snow             |

```
[390 rows x 8 columns]
```

So 390 is our answer

```
#but if we want to find all occurrences of snow  
data['Weather Condtion'].str.contains('Snow')
```

```
0      False  
1      False  
2      False  
3      False  
4      False
```

```
...  
8779    True  
8780    True  
8781    True  
8782    True  
8783    True
```

```
Name: Weather Condtion, Length: 8784, dtype: bool
```

```
data[data['Weather Condtion'].str.contains('Snow')]
```

|              | Date/Time        | Temp_C    | Dew Point Temp_C | Rel Hum_% | Wind |
|--------------|------------------|-----------|------------------|-----------|------|
| Speed_km/h \ |                  |           |                  |           |      |
| 41           | 1/2/2012 17:00   | -2.1      | -9.5             | 57        |      |
| 22           |                  |           |                  |           |      |
| 44           | 1/2/2012 20:00   | -5.6      | -13.4            | 54        |      |
| 24           |                  |           |                  |           |      |
| 45           | 1/2/2012 21:00   | -5.8      | -12.8            | 58        |      |
| 26           |                  |           |                  |           |      |
| 47           | 1/2/2012 23:00   | -7.4      | -14.1            | 59        |      |
| 17           |                  |           |                  |           |      |
| 48           | 1/3/2012 0:00    | -9.0      | -16.0            | 57        |      |
| 28           |                  |           |                  |           |      |
| ...          | ...              | ...       | ...              | ...       |      |
| ...          |                  |           |                  |           |      |
| 8779         | 12/31/2012 19:00 | 0.1       | -2.7             | 81        |      |
| 30           |                  |           |                  |           |      |
| 8780         | 12/31/2012 20:00 | 0.2       | -2.4             | 83        |      |
| 24           |                  |           |                  |           |      |
| 8781         | 12/31/2012 21:00 | -0.5      | -1.5             | 93        |      |
| 28           |                  |           |                  |           |      |
| 8782         | 12/31/2012 22:00 | -0.2      | -1.8             | 89        |      |
| 28           |                  |           |                  |           |      |
| 8783         | 12/31/2012 23:00 | 0.0       | -2.1             | 86        |      |
| 30           |                  |           |                  |           |      |
|              | Visibility_km    | Press_kPa | Weather Condtion |           |      |
| 41           | 25.0             | 99.66     | Snow Showers     |           |      |



|      |      |        |              |
|------|------|--------|--------------|
| 44   | 25.0 | 100.07 | Snow Showers |
| 45   | 25.0 | 100.15 | Snow Showers |
| 47   | 19.3 | 100.27 | Snow Showers |
| 48   | 25.0 | 100.35 | Snow Showers |
| ...  | ...  | ...    | ...          |
| 8779 | 9.7  | 100.13 | Snow         |
| 8780 | 9.7  | 100.03 | Snow         |
| 8781 | 4.8  | 99.95  | Snow         |
| 8782 | 9.7  | 99.91  | Snow         |
| 8783 | 11.3 | 99.89  | Snow         |

[583 rows x 8 columns]

Q10-> Find all instances when 'Wind Speed is above 24' and Visibility is 25.

```
data
      Date/Time  Temp_C  Dew Point Temp_C  Rel Hum_%  Wind
Speed_km/h \
0      1/1/2012 0:00    -1.8                -3.9        86
4
1      1/1/2012 1:00    -1.8                -3.7        87
4
2      1/1/2012 2:00    -1.8                -3.4        89
7
3      1/1/2012 3:00    -1.5                -3.2        88
6
4      1/1/2012 4:00    -1.5                -3.3        88
7
...
...
8779  12/31/2012 19:00    0.1                -2.7        81
30
8780  12/31/2012 20:00    0.2                -2.4        83
24
8781  12/31/2012 21:00   -0.5                -1.5        93
28
8782  12/31/2012 22:00   -0.2                -1.8        89
28
8783  12/31/2012 23:00    0.0                -2.1        86
30

      Visibility_km  Press_kPa      Weather Condtion
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 | 9.7  | 100.13 | Snow |
| 8780 | 9.7  | 100.03 | Snow |
| 8781 | 4.8  | 99.95  | Snow |
| 8782 | 9.7  | 99.91  | Snow |
| 8783 | 11.3 | 99.89  | Snow |

[8784 rows x 8 columns]

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 \ |
|------|------------------|--------|------------------|-----------|-------------------|
| 23   | 1/1/2012 23:00   | 5.3    | 2.0              | 79        | 30                |
| 24   | 1/2/2012 0:00    | 5.2    | 1.5              | 77        | 35                |
| 25   | 1/2/2012 1:00    | 4.6    | 0.0              | 72        | 39                |
| 26   | 1/2/2012 2:00    | 3.9    | -0.9             | 71        | 32                |
| 27   | 1/2/2012 3:00    | 3.7    | -1.5             | 69        | 33                |
| ...  | ...              | ...    | ...              | ...       | ...               |
| 8705 | 12/28/2012 17:00 | -8.6   | -12.0            | 76        | 26                |
| 8753 | 12/30/2012 17:00 | -12.1  | -15.8            | 74        | 28                |
| 8755 | 12/30/2012 19:00 | -13.4  | -16.5            | 77        | 26                |
| 8759 | 12/30/2012 23:00 | -12.1  | -15.1            | 78        | 28                |
| 8760 | 12/31/2012 0:00  | -11.1  | -14.4            | 77        | 26                |

|      | Visibility_km | Press_kPa | Weather | Condtion |
|------|---------------|-----------|---------|----------|
| 23   | 25.0          | 99.31     |         | Cloudy   |
| 24   | 25.0          | 99.26     | Rain    | Showers  |
| 25   | 25.0          | 99.26     |         | Cloudy   |
| 26   | 25.0          | 99.26     | Mostly  | Cloudy   |
| 27   | 25.0          | 99.30     | Mostly  | Cloudy   |
| ...  | ...           | ...       |         | ...      |
| 8705 | 25.0          | 101.34    | Mainly  | Clear    |
| 8753 | 25.0          | 101.26    | Mainly  | Clear    |
| 8755 | 25.0          | 101.47    | Mainly  | Clear    |
| 8759 | 25.0          | 101.52    | Mostly  | Cloudy   |
| 8760 | 25.0          | 101.51    |         | Cloudy   |

[308 rows x 8 columns]

Q11-> What is the mean value for each column against each weather condition?

```
data
```

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

[8784 rows x 8 columns]

```
data.groupby('Weather Condntion').mean()
```

C:\Users\Intel\AppData\Local\Temp\ipykernel\_10000\665595762.py:1:  
FutureWarning: The default value of numeric\_only in  
DataFrameGroupBy.mean is deprecated. In a future version, numeric\_only

will default to False. Either specify numeric\_only or select only columns which should be valid for the function.

```
data.groupby('Weather Condtion').mean()
```

| Temp_C \<br>Weather Condtion  | Temp_C    | Dew Point |
|-------------------------------|-----------|-----------|
| Clear                         | 6.825716  | 0.089367  |
| Cloudy                        | 7.970544  | 2.375810  |
| Drizzle                       | 7.353659  | 5.504878  |
| Drizzle,Fog                   | 8.067500  | 7.033750  |
| Drizzle,Ice Pellets,Fog       | 0.400000  | -0.700000 |
| Drizzle,Snow                  | 1.050000  | 0.150000  |
| Drizzle,Snow,Fog              | 0.693333  | 0.120000  |
| Fog                           | 4.303333  | 3.159333  |
| Freezing Drizzle              | -5.657143 | -8.000000 |
| Freezing Drizzle,Fog          | -2.533333 | -4.183333 |
| Freezing Drizzle,Haze         | -5.433333 | -8.000000 |
| Freezing Drizzle,Snow         | -5.109091 | -7.072727 |
| Freezing Fog                  | -7.575000 | -9.250000 |
| Freezing Rain                 | -3.885714 | -6.078571 |
| Freezing Rain,Fog             | -2.225000 | -3.750000 |
| Freezing Rain,Haze            | -4.900000 | -7.450000 |
| Freezing Rain,Ice Pellets,Fog | -2.600000 | -3.700000 |
| Freezing Rain,Snow Grains     | -5.000000 | -7.300000 |
| Haze                          | -0.200000 | -2.975000 |
| Mainly Clear                  | 12.558927 | 4.581671  |
| Moderate Rain,Fog             | 1.700000  | 0.800000  |
| Moderate Snow                 | -5.525000 | -7.250000 |

|   |            |            |
|---|------------|------------|
| Moderate Snow,Blowing Snow              | -5.450000  | -6.500000  |
| Mostly Cloudy                           | 10.574287  | 3.131174   |
| Rain                                    | 9.786275   | 7.042810   |
| Rain Showers                            | 13.722340  | 9.187766   |
| Rain Showers,Fog                        | 12.800000  | 12.100000  |
| Rain Showers,Snow Showers               | 2.150000   | -1.500000  |
| Rain,Fog                                | 8.273276   | 7.219828   |
| Rain,Haze                               | 4.633333   | 2.066667   |
| Rain,Ice Pellets                        | 0.600000   | -0.600000  |
| Rain,Snow                               | 1.055556   | -0.566667  |
| Rain,Snow Grains                        | 1.900000   | -2.100000  |
| Rain,Snow,Fog                           | 0.800000   | 0.300000   |
| Rain,Snow,Ice Pellets                   | 1.100000   | -0.175000  |
| Snow                                    | -4.524103  | -7.623333  |
| Snow Pellets                            | 0.700000   | -6.400000  |
| Snow Showers                            | -3.506667  | -7.866667  |
| Snow Showers,Fog                        | -10.675000 | -11.900000 |
| Snow,Blowing Snow                       | -5.410526  | -7.621053  |
| Snow,Fog                                | -5.075676  | -6.364865  |
| Snow,Haze                               | -4.020000  | -6.860000  |
| Snow,Ice Pellets                        | -1.883333  | -3.666667  |
| Thunderstorms                           | 24.150000  | 19.750000  |
| Thunderstorms,Heavy Rain Showers        | 10.900000  | 9.000000   |
| Thunderstorms,Moderate Rain Showers,Fog | 19.600000  | 18.500000  |
| Thunderstorms,Rain                      | 20.433333  | 18.533333  |
| Thunderstorms,Rain Showers              | 20.037500  | 17.618750  |

|                                |           |                   |
|--------------------------------|-----------|-------------------|
| Thunderstorms,Rain Showers,Fog | 21.600000 | 18.700000         |
| Thunderstorms,Rain,Fog         | 20.600000 | 18.600000         |
|                                | Rel Hum_% | Wind Speed_km/h \ |
| Weather Condtion               |           |                   |
| Clear                          | 64.497738 | 10.557315         |
| Cloudy                         | 69.592593 | 16.127315         |
| Drizzle                        | 88.243902 | 16.097561         |
| Drizzle,Fog                    | 93.275000 | 11.862500         |
| Drizzle,Ice Pellets,Fog        | 92.000000 | 20.000000         |
| Drizzle,Snow                   | 93.500000 | 14.000000         |
| Drizzle,Snow,Fog               | 95.866667 | 15.533333         |
| Fog                            | 92.286667 | 7.946667          |
| Freezing Drizzle               | 83.571429 | 16.571429         |
| Freezing Drizzle,Fog           | 88.500000 | 17.000000         |
| Freezing Drizzle,Haze          | 82.000000 | 10.333333         |
| Freezing Drizzle,Snow          | 86.090909 | 16.272727         |
| Freezing Fog                   | 87.750000 | 4.750000          |
| Freezing Rain                  | 84.642857 | 19.214286         |
| Freezing Rain,Fog              | 89.500000 | 15.500000         |
| Freezing Rain,Haze             | 82.500000 | 7.500000          |
| Freezing Rain,Ice Pellets,Fog  | 92.000000 | 28.000000         |
| Freezing Rain,Snow Grains      | 84.000000 | 32.000000         |
| Haze                           | 81.625000 | 10.437500         |
| Mainly Clear                   | 60.667142 | 14.144824         |
| Moderate Rain,Fog              | 94.000000 | 17.000000         |
| Moderate Snow                  | 87.750000 | 33.750000         |
| Moderate Snow,Blowing Snow     | 92.500000 | 40.000000         |
| Mostly Cloudy                  | 62.102465 | 15.813920         |
| Rain                           | 83.624183 | 19.254902         |
| Rain Showers                   | 75.159574 | 17.132979         |
| Rain Showers,Fog               | 96.000000 | 13.000000         |
| Rain Showers,Snow Showers      | 76.500000 | 22.500000         |
| Rain,Fog                       | 93.189655 | 14.793103         |
| Rain,Haze                      | 83.333333 | 11.666667         |
| Rain,Ice Pellets               | 92.000000 | 24.000000         |
| Rain,Snow                      | 89.000000 | 28.388889         |
| Rain,Snow Grains               | 75.000000 | 26.000000         |
| Rain,Snow,Fog                  | 96.000000 | 9.000000          |
| Rain,Snow,Ice Pellets          | 91.500000 | 23.250000         |
| Snow                           | 79.307692 | 20.038462         |
| Snow Pellets                   | 59.000000 | 35.000000         |
| Snow Showers                   | 72.350000 | 19.233333         |
| Snow Showers,Fog               | 90.750000 | 13.750000         |
| Snow,Blowing Snow              | 84.473684 | 34.842105         |
| Snow,Fog                       | 90.675676 | 17.324324         |
| Snow,Haze                      | 80.600000 | 5.000000          |
| Snow,Ice Pellets               | 87.666667 | 23.833333         |

|   |           |           |
|---|-----------|-----------|
| Thunderstorms                           | 77.000000 | 7.500000  |
| Thunderstorms,Heavy Rain Showers        | 88.000000 | 9.000000  |
| Thunderstorms,Moderate Rain Showers,Fog | 93.000000 | 15.000000 |
| Thunderstorms,Rain                      | 89.000000 | 15.666667 |
| Thunderstorms,Rain Showers              | 86.375000 | 18.312500 |
| Thunderstorms,Rain Showers,Fog          | 84.000000 | 19.666667 |
| Thunderstorms,Rain,Fog                  | 88.000000 | 19.000000 |

|                               | Visibility_km | Press_kPa  |
|-------------------------------|---------------|------------|
| Weather Condtion              |               |            |
| Clear                         | 30.153243     | 101.587443 |
| Cloudy                        | 26.625752     | 100.911441 |
| Drizzle                       | 17.931707     | 100.435366 |
| Drizzle,Fog                   | 5.257500      | 100.786625 |
| Drizzle,Ice Pellets,Fog       | 4.000000      | 100.790000 |
| Drizzle,Snow                  | 10.500000     | 100.890000 |
| Drizzle,Snow,Fog              | 5.513333      | 99.281333  |
| Fog                           | 6.248000      | 101.184067 |
| Freezing Drizzle              | 9.200000      | 100.202857 |
| Freezing Drizzle,Fog          | 5.266667      | 100.441667 |
| Freezing Drizzle,Haze         | 2.666667      | 100.316667 |
| Freezing Drizzle,Snow         | 5.872727      | 100.520909 |
| Freezing Fog                  | 0.650000      | 102.320000 |
| Freezing Rain                 | 8.242857      | 99.647143  |
| Freezing Rain,Fog             | 7.550000      | 99.945000  |
| Freezing Rain,Haze            | 2.400000      | 100.375000 |
| Freezing Rain,Ice Pellets,Fog | 8.000000      | 100.950000 |
| Freezing Rain,Snow Grains     | 4.800000      | 98.560000  |
| Haze                          | 7.831250      | 101.482500 |
| Mainly Clear                  | 34.264862     | 101.248832 |
| Moderate Rain,Fog             | 6.400000      | 99.980000  |
| Moderate Snow                 | 0.750000      | 100.275000 |
| Moderate Snow,Blowing Snow    | 0.600000      | 100.570000 |
| Mostly Cloudy                 | 31.253842     | 101.025288 |
| Rain                          | 18.856536     | 100.233333 |
| Rain Showers                  | 22.816489     | 100.404043 |
| Rain Showers,Fog              | 6.400000      | 99.830000  |
| Rain Showers,Snow Showers     | 21.700000     | 101.100000 |
| Rain,Fog                      | 6.873276      | 100.500862 |
| Rain,Haze                     | 6.700000      | 100.540000 |
| Rain,Ice Pellets              | 9.700000      | 100.120000 |
| Rain,Snow                     | 11.672222     | 99.951111  |
| Rain,Snow Grains              | 25.000000     | 100.600000 |
| Rain,Snow,Fog                 | 6.400000      | 100.730000 |
| Rain,Snow,Ice Pellets         | 6.000000      | 100.105000 |
| Snow                          | 11.171795     | 100.536103 |
| Snow Pellets                  | 2.400000      | 99.700000  |
| Snow Showers                  | 20.158333     | 100.963500 |
| Snow Showers,Fog              | 7.025000      | 101.292500 |

|   |           |            |
|---|-----------|------------|
| Snow,Blowing Snow                       | 4.105263  | 99.704737  |
| Snow,Fog                                | 4.537838  | 100.688649 |
| Snow,Haze                               | 4.640000  | 100.782000 |
| Snow,Ice Pellets                        | 7.416667  | 100.548333 |
| Thunderstorms                           | 24.550000 | 100.230000 |
| Thunderstorms,Heavy Rain Showers        | 2.400000  | 100.260000 |
| Thunderstorms,Moderate Rain Showers,Fog | 3.200000  | 100.010000 |
| Thunderstorms,Rain                      | 19.833333 | 100.420000 |
| Thunderstorms,Rain Showers              | 15.893750 | 100.233750 |
| Thunderstorms,Rain Showers,Fog          | 9.700000  | 100.063333 |
| Thunderstorms,Rain,Fog                  | 4.800000  | 100.080000 |

Q12-> What is the minimum and maximum value of each column against each weather condition?

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

[8784 rows x 8 columns]

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

|                               | Date/Time        | Temp_C | \ |
|-------------------------------|------------------|--------|---|
| Weather Condntion             |                  |        |   |
| 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   |   |
| Freezing Rain,Fog             | 1/17/2012 23:00  | -6.1   |   |
| Freezing Rain,Haze            | 2/1/2012 14:00   | -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                          | 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    |   |
| Snow                          | 1/10/2012 1:00   | -16.7  |   |
| 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  |

|                               | Dew Point Temp_C | Rel Hum_ |
|-------------------------------|------------------|----------|
| % \                           |                  |          |
| Weather Condtion              |                  |          |
| Clear                         | -28.5            | 20       |
| Cloudy                        | -26.8            | 18       |
| Drizzle                       | -0.2             | 74       |
| Drizzle,Fog                   | -1.6             | 85       |
| Drizzle,Ice Pellets,Fog       | -0.7             | 92       |
| Drizzle,Snow                  | 0.1              | 92       |
| Drizzle,Snow,Fog              | -0.1             | 92       |
| Fog                           | -17.2            | 80       |
| Freezing Drizzle              | -12.2            | 78       |
| Freezing Drizzle,Fog          | -9.0             | 82       |
| Freezing Drizzle,Haze         | -8.3             | 81       |
| Freezing Drizzle,Snow         | -10.4            | 79       |
| Freezing Fog                  | -22.9            | 71       |
| Freezing Rain                 | -9.0             | 81       |
| Freezing Rain,Fog             | -8.7             | 82       |
| Freezing Rain,Haze            | -7.5             | 82       |
| Freezing Rain,Ice Pellets,Fog | -3.7             | 92       |

|                            |       |    |
|----------------------------|-------|----|
| Freezing Rain,Snow Grains  | -7.3  | 84 |
| Haze                       | -16.0 | 68 |
| Mainly Clear               | -28.0 | 20 |
| Moderate Rain,Fog          | 0.8   | 94 |
| Moderate Snow              | -7.6  | 83 |
| Moderate Snow,Blowing Snow | -6.6  | 92 |
| Mostly Cloudy              | -28.5 | 18 |
| Rain                       | -5.7  | 40 |
| Rain Showers               | -7.2  | 37 |
| Rain Showers,Fog           | 12.1  | 96 |
| Rain Showers,Snow Showers  | -1.8  | 75 |
| Rain,Fog                   | -1.2  | 83 |
| Rain,Haze                  | 1.0   | 81 |
| Rain,Ice Pellets           | -0.6  | 92 |
| Rain,Snow                  | -1.7  | 81 |
| Rain,Snow Grains           | -2.1  | 75 |
| Rain,Snow,Fog              | 0.3   | 96 |
| Rain,Snow,Ice Pellets      | -0.7  | 88 |
| Snow                       | -24.6 | 41 |
| Snow Pellets               | -6.4  | 59 |
| Snow Showers               | -19.3 | 52 |
| Snow Showers,Fog           | -12.7 | 89 |
| Snow,Blowing Snow          | -16.2 | 70 |
| Snow,Fog                   | -12.0 | 77 |
| Snow,Haze                  | -7.2  | 80 |
| Snow,Ice Pellets           | -5.9  | 76 |

|   |      |    |
|---|------|----|
| Thunderstorms                           | 19.4 | 67 |
| Thunderstorms,Heavy Rain Showers        | 9.0  | 88 |
| Thunderstorms,Moderate Rain Showers,Fog | 18.5 | 93 |
| Thunderstorms,Rain                      | 18.2 | 83 |
| Thunderstorms,Rain Showers              | 7.0  | 68 |
| Thunderstorms,Rain Showers,Fog          | 16.1 | 80 |
| Thunderstorms,Rain,Fog                  | 18.6 | 88 |
| Wind Speed_km/h                         |      |    |
| Visibility_km \<br>Weather Condtion     |      |    |
| Clear                                   | 0    |    |
| 11.3                                    |      |    |
| Cloudy                                  | 0    |    |
| 11.3                                    |      |    |
| Drizzle                                 | 0    |    |
| 6.4                                     |      |    |
| Drizzle,Fog                             | 0    |    |
| 1.0                                     |      |    |
| Drizzle,Ice Pellets,Fog                 | 20   |    |
| 4.0                                     |      |    |
| Drizzle,Snow                            | 9    |    |
| 9.7                                     |      |    |
| Drizzle,Snow,Fog                        | 7    |    |
| 2.4                                     |      |    |
| Fog                                     | 0    |    |
| 0.2                                     |      |    |
| Freezing Drizzle                        | 6    |    |
| 4.8                                     |      |    |
| Freezing Drizzle,Fog                    | 6    |    |
| 3.6                                     |      |    |
| Freezing Drizzle,Haze                   | 9    |    |
| 2.0                                     |      |    |
| Freezing Drizzle,Snow                   | 6    |    |
| 2.4                                     |      |    |
| Freezing Fog                            | 0    |    |
| 0.2                                     |      |    |
| Freezing Rain                           | 7    |    |
| 2.8                                     |      |    |
| Freezing Rain,Fog                       | 7    |    |
| 2.8                                     |      |    |
| Freezing Rain,Haze                      | 6    |    |

|                               |    |
|-------------------------------|----|
| 2.0                           |    |
| Freezing Rain,Ice Pellets,Fog | 28 |
| 8.0                           |    |
| Freezing Rain,Snow Grains     | 32 |
| 4.8                           |    |
| Haze                          | 0  |
| 4.8                           |    |
| Mainly Clear                  | 0  |
| 12.9                          |    |
| Moderate Rain,Fog             | 17 |
| 6.4                           |    |
| Moderate Snow                 | 26 |
| 0.6                           |    |
| Moderate Snow,Blowing Snow    | 39 |
| 0.6                           |    |
| Mostly Cloudy                 | 0  |
| 11.3                          |    |
| Rain                          | 0  |
| 4.0                           |    |
| Rain Showers                  | 0  |
| 6.4                           |    |
| Rain Showers,Fog              | 13 |
| 6.4                           |    |
| Rain Showers,Snow Showers     | 17 |
| 19.3                          |    |
| Rain,Fog                      | 0  |
| 2.0                           |    |
| Rain,Haze                     | 7  |
| 4.0                           |    |
| Rain,Ice Pellets              | 24 |
| 9.7                           |    |
| Rain,Snow                     | 13 |
| 2.4                           |    |
| Rain,Snow Grains              | 26 |
| 25.0                          |    |
| Rain,Snow,Fog                 | 9  |
| 6.4                           |    |
| Rain,Snow,Ice Pellets         | 17 |
| 4.8                           |    |
| Snow                          | 0  |
| 1.0                           |    |
| Snow Pellets                  | 35 |
| 2.4                           |    |
| Snow Showers                  | 0  |
| 2.4                           |    |
| Snow Showers,Fog              | 7  |
| 4.0                           |    |
| Snow,Blowing Snow             | 24 |
| 0.6                           |    |

|   |    |
|---|----|
| Snow,Fog                                | 4  |
| 1.2                                     |    |
| Snow,Haze                               | 0  |
| 4.0                                     |    |
| Snow,Ice Pellets                        | 19 |
| 2.8                                     |    |
| Thunderstorms                           | 0  |
| 24.1                                    |    |
| Thunderstorms,Heavy Rain Showers        | 9  |
| 2.4                                     |    |
| Thunderstorms,Moderate Rain Showers,Fog | 15 |
| 3.2                                     |    |
| Thunderstorms,Rain                      | 4  |
| 16.1                                    |    |
| Thunderstorms,Rain Showers              | 7  |
| 6.4                                     |    |
| Thunderstorms,Rain Showers,Fog          | 7  |
| 9.7                                     |    |
| Thunderstorms,Rain,Fog                  | 19 |
| 4.8                                     |    |

|                               | Press_kPa |
|-------------------------------|-----------|
| Weather Condtion              |           |
| Clear                         | 99.52     |
| Cloudy                        | 98.39     |
| Drizzle                       | 97.84     |
| Drizzle,Fog                   | 98.65     |
| Drizzle,Ice Pellets,Fog       | 100.79    |
| Drizzle,Snow                  | 100.63    |
| Drizzle,Snow,Fog              | 97.79     |
| Fog                           | 98.31     |
| Freezing Drizzle              | 98.44     |
| Freezing Drizzle,Fog          | 98.74     |
| Freezing Drizzle,Haze         | 100.28    |
| Freezing Drizzle,Snow         | 99.19     |
| Freezing Fog                  | 101.97    |
| Freezing Rain                 | 98.22     |
| Freezing Rain,Fog             | 98.32     |
| Freezing Rain,Haze            | 100.34    |
| Freezing Rain,Ice Pellets,Fog | 100.95    |
| Freezing Rain,Snow Grains     | 98.56     |
| Haze                          | 100.35    |
| Mainly Clear                  | 98.67     |
| Moderate Rain,Fog             | 99.98     |
| Moderate Snow                 | 99.88     |
| Moderate Snow,Blowing Snow    | 100.50    |
| Mostly Cloudy                 | 98.36     |
| Rain                          | 97.52     |
| Rain Showers                  | 98.51     |

|   |        |
|---|--------|
| Rain Showers,Fog                        | 99.83  |
| Rain Showers,Snow Showers               | 101.09 |
| Rain,Fog                                | 98.61  |
| Rain,Haze                               | 100.50 |
| Rain,Ice Pellets                        | 100.12 |
| Rain,Snow                               | 98.18  |
| Rain,Snow Grains                        | 100.60 |
| Rain,Snow,Fog                           | 100.73 |
| Rain,Snow,Ice Pellets                   | 99.85  |
| Snow                                    | 97.75  |
| Snow Pellets                            | 99.70  |
| Snow Showers                            | 99.49  |
| Snow Showers,Fog                        | 100.63 |
| Snow,Blowing Snow                       | 98.11  |
| Snow,Fog                                | 99.38  |
| Snow,Haze                               | 100.61 |
| Snow,Ice Pellets                        | 99.40  |
| Thunderstorms                           | 99.84  |
| Thunderstorms,Heavy Rain Showers        | 100.26 |
| Thunderstorms,Moderate Rain Showers,Fog | 100.01 |
| Thunderstorms,Rain                      | 100.19 |
| Thunderstorms,Rain Showers              | 99.65  |
| Thunderstorms,Rain Showers,Fog          | 99.71  |
| Thunderstorms,Rain,Fog                  | 100.08 |

```
data.groupby('Weather Condtion').max()
```

|                               | Date/Time        | Temp_C | \ |
|-------------------------------|------------------|--------|---|
| Weather Condtion              |                  |        |   |
| 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    |   |
| Freezing Rain,Fog             | 12/17/2012 1:00  | 0.1    |   |
| 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      |
| Rain,Snow,Ice Pellets                   | 12/21/2012 5:00  | 1.3      |
| Snow                                    | 4/27/2012 9:00   | 3.7      |
| 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     |
|   |                  |          |
| Dew Point Temp_C                        |                  | Rel Hum_ |
| % \                                     |                  |          |
| Weather Condtion                        |                  |          |
| Clear                                   | 20.4             | 99       |
| Cloudy                                  | 22.6             | 99       |
| Drizzle                                 | 17.7             | 96       |
| Drizzle,Fog                             | 19.1             | 100      |
| Drizzle,Ice Pellets,Fog                 | -0.7             | 92       |
| Drizzle,Snow                            | 0.2              | 95       |
| Drizzle,Snow,Fog                        | 0.6              | 98       |
| Fog                                     | 19.6             | 100      |



|                               |      |     |
|-------------------------------|------|-----|
| Freezing Drizzle              | -3.3 | 93  |
| Freezing Drizzle,Fog          | -2.3 | 94  |
| Freezing Drizzle,Haze         | -7.7 | 83  |
| Freezing Drizzle,Snow         | -4.6 | 94  |
| Freezing Fog                  | -0.3 | 99  |
| Freezing Rain                 | -1.7 | 92  |
| Freezing Rain,Fog             | -0.9 | 93  |
| Freezing Rain,Haze            | -7.4 | 83  |
| Freezing Rain,Ice Pellets,Fog | -3.7 | 92  |
| Freezing Rain,Snow Grains     | -7.3 | 84  |
| Haze                          | 11.1 | 86  |
| Mainly Clear                  | 21.2 | 99  |
| Moderate Rain,Fog             | 0.8  | 94  |
| Moderate Snow                 | -6.7 | 93  |
| Moderate Snow,Blowing Snow    | -6.4 | 93  |
| Mostly Cloudy                 | 24.4 | 100 |
| Rain                          | 20.4 | 99  |
| Rain Showers                  | 23.0 | 97  |
| Rain Showers,Fog              | 12.1 | 96  |
| Rain Showers,Snow Showers     | -1.2 | 78  |
| Rain,Fog                      | 19.5 | 100 |
| Rain,Haze                     | 2.9  | 86  |
| Rain,Ice Pellets              | -0.6 | 92  |
| Rain,Snow                     | 0.5  | 94  |
| Rain,Snow Grains              | -2.1 | 75  |
| Rain,Snow,Fog                 | 0.3  | 96  |

|   |       |    |
|---|-------|----|
| Rain,Snow,Ice Pellets                   | 0.1   | 94 |
| Snow                                    | 0.3   | 96 |
| Snow Pellets                            | -6.4  | 59 |
| Snow Showers                            | -0.7  | 94 |
| Snow Showers,Fog                        | -11.1 | 92 |
| Snow,Blowing Snow                       | -2.9  | 91 |
| Snow,Fog                                | 0.8   | 99 |
| Snow,Haze                               | -6.4  | 81 |
| Snow,Ice Pellets                        | -1.7  | 92 |
| Thunderstorms                           | 20.1  | 87 |
| Thunderstorms,Heavy Rain Showers        | 9.0   | 88 |
| Thunderstorms,Moderate Rain Showers,Fog | 18.5  | 93 |
| Thunderstorms,Rain                      | 19.1  | 93 |
| Thunderstorms,Rain Showers              | 23.1  | 98 |
| Thunderstorms,Rain Showers,Fog          | 21.3  | 91 |
| Thunderstorms,Rain,Fog                  | 18.6  | 88 |
| Wind Speed_km/h                         |       |    |
| Visibility_km \<br>Weather Condion      |       |    |
| Clear                                   | 33    |    |
| 48.3                                    |       |    |
| Cloudy                                  | 54    |    |
| 48.3                                    |       |    |
| Drizzle                                 | 30    |    |
| 25.0                                    |       |    |
| Drizzle,Fog                             | 28    |    |
| 9.7                                     |       |    |
| Drizzle,Ice Pellets,Fog                 | 20    |    |
| 4.0                                     |       |    |
| Drizzle,Snow                            | 19    |    |
| 11.3                                    |       |    |
| Drizzle,Snow,Fog                        | 32    |    |
| 9.7                                     |       |    |

|                               |    |
|-------------------------------|----|
| Fog                           | 22 |
| 9.7                           |    |
| Freezing Drizzle              | 26 |
| 12.9                          |    |
| Freezing Drizzle,Fog          | 33 |
| 8.0                           |    |
| Freezing Drizzle,Haze         | 11 |
| 4.0                           |    |
| Freezing Drizzle,Snow         | 24 |
| 12.9                          |    |
| Freezing Fog                  | 9  |
| 0.8                           |    |
| Freezing Rain                 | 28 |
| 16.1                          |    |
| Freezing Rain,Fog             | 26 |
| 9.7                           |    |
| Freezing Rain,Haze            | 9  |
| 2.8                           |    |
| Freezing Rain,Ice Pellets,Fog | 28 |
| 8.0                           |    |
| Freezing Rain,Snow Grains     | 32 |
| 4.8                           |    |
| Haze                          | 17 |
| 9.7                           |    |
| Mainly Clear                  | 63 |
| 48.3                          |    |
| Moderate Rain,Fog             | 17 |
| 6.4                           |    |
| Moderate Snow                 | 39 |
| 0.8                           |    |
| Moderate Snow,Blowing Snow    | 41 |
| 0.6                           |    |
| Mostly Cloudy                 | 83 |
| 48.3                          |    |
| Rain                          | 52 |
| 48.3                          |    |
| Rain Showers                  | 41 |
| 48.3                          |    |
| Rain Showers,Fog              | 13 |
| 6.4                           |    |
| Rain Showers,Snow Showers     | 28 |
| 24.1                          |    |
| Rain,Fog                      | 46 |
| 9.7                           |    |
| Rain,Haze                     | 17 |
| 9.7                           |    |
| Rain,Ice Pellets              | 24 |
| 9.7                           |    |
| Rain,Snow                     | 52 |

|   |    |
|---|----|
| 25.0                                    |    |
| Rain,Snow Grains                        | 26 |
| 25.0                                    |    |
| Rain,Snow,Fog                           | 9  |
| 6.4                                     |    |
| Rain,Snow,Ice Pellets                   | 28 |
| 6.4                                     |    |
| Snow                                    | 57 |
| 25.0                                    |    |
| Snow Pellets                            | 35 |
| 2.4                                     |    |
| Snow Showers                            | 37 |
| 48.3                                    |    |
| Snow Showers,Fog                        | 22 |
| 9.7                                     |    |
| Snow,Blowing Snow                       | 48 |
| 9.7                                     |    |
| Snow,Fog                                | 35 |
| 9.7                                     |    |
| Snow,Haze                               | 15 |
| 6.4                                     |    |
| Snow,Ice Pellets                        | 33 |
| 11.3                                    |    |
| Thunderstorms                           | 15 |
| 25.0                                    |    |
| Thunderstorms,Heavy Rain Showers        | 9  |
| 2.4                                     |    |
| Thunderstorms,Moderate Rain Showers,Fog | 15 |
| 3.2                                     |    |
| Thunderstorms,Rain                      | 30 |
| 24.1                                    |    |
| Thunderstorms,Rain Showers              | 32 |
| 25.0                                    |    |
| Thunderstorms,Rain Showers,Fog          | 35 |
| 9.7                                     |    |
| Thunderstorms,Rain,Fog                  | 19 |
| 4.8                                     |    |

|                         | Press_kPa |
|-------------------------|-----------|
| Weather Condtion        |           |
| Clear                   | 103.63    |
| Cloudy                  | 103.65    |
| Drizzle                 | 101.56    |
| Drizzle,Fog             | 102.07    |
| Drizzle,Ice Pellets,Fog | 100.79    |
| Drizzle,Snow            | 101.15    |
| Drizzle,Snow,Fog        | 100.15    |
| Fog                     | 103.04    |
| Freezing Drizzle        | 101.02    |

|   |        |
|---|--------|
| Freezing Drizzle,Fog                    | 101.27 |
| Freezing Drizzle,Haze                   | 100.36 |
| Freezing Drizzle,Snow                   | 101.18 |
| Freezing Fog                            | 102.85 |
| Freezing Rain                           | 101.00 |
| Freezing Rain,Fog                       | 101.01 |
| Freezing Rain,Haze                      | 100.41 |
| Freezing Rain,Ice Pellets,Fog           | 100.95 |
| Freezing Rain,Snow Grains               | 98.56  |
| Haze                                    | 102.97 |
| Mainly Clear                            | 103.59 |
| Moderate Rain,Fog                       | 99.98  |
| Moderate Snow                           | 100.67 |
| Moderate Snow,Blowing Snow              | 100.64 |
| Mostly Cloudy                           | 103.65 |
| Rain                                    | 102.26 |
| Rain Showers                            | 102.31 |
| Rain Showers,Fog                        | 99.83  |
| Rain Showers,Snow Showers               | 101.11 |
| Rain,Fog                                | 101.77 |
| Rain,Haze                               | 100.61 |
| Rain,Ice Pellets                        | 100.12 |
| Rain,Snow                               | 101.07 |
| Rain,Snow Grains                        | 100.60 |
| Rain,Snow,Fog                           | 100.73 |
| Rain,Snow,Ice Pellets                   | 100.47 |
| Snow                                    | 102.73 |
| Snow Pellets                            | 99.70  |
| Snow Showers                            | 102.50 |
| Snow Showers,Fog                        | 102.52 |
| Snow,Blowing Snow                       | 100.62 |
| Snow,Fog                                | 102.07 |
| Snow,Haze                               | 100.99 |
| Snow,Ice Pellets                        | 100.96 |
| Thunderstorms                           | 100.62 |
| Thunderstorms,Heavy Rain Showers        | 100.26 |
| Thunderstorms,Moderate Rain Showers,Fog | 100.01 |
| Thunderstorms,Rain                      | 100.83 |
| Thunderstorms,Rain Showers              | 101.06 |
| Thunderstorms,Rain Showers,Fog          | 100.64 |
| Thunderstorms,Rain,Fog                  | 100.08 |

Q13-> Show all the weather condition where Weather condition is "Fog"

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

```

      Date/Time  Temp_C  Dew Point Temp_C  Rel Hum_%  Wind
Speed_km/h  \

```

|      |                  |       |       |     |
|------|------------------|-------|-------|-----|
| 0    | 1/1/2012 0:00    | -1.8  | -3.9  | 86  |
| 4    |                  |       |       |     |
| 1    | 1/1/2012 1:00    | -1.8  | -3.7  | 87  |
| 4    |                  |       |       |     |
| 4    | 1/1/2012 4:00    | -1.5  | -3.3  | 88  |
| 7    |                  |       |       |     |
| 5    | 1/1/2012 5:00    | -1.4  | -3.3  | 87  |
| 9    |                  |       |       |     |
| 6    | 1/1/2012 6:00    | -1.5  | -3.1  | 89  |
| 7    |                  |       |       |     |
| ...  | ...              | ...   | ...   | ... |
| ...  |                  |       |       |     |
| 8716 | 12/29/2012 4:00  | -16.0 | -17.2 | 90  |
| 6    |                  |       |       |     |
| 8717 | 12/29/2012 5:00  | -14.8 | -15.9 | 91  |
| 4    |                  |       |       |     |
| 8718 | 12/29/2012 6:00  | -13.8 | -15.3 | 88  |
| 4    |                  |       |       |     |
| 8719 | 12/29/2012 7:00  | -14.8 | -16.4 | 88  |
| 7    |                  |       |       |     |
| 8722 | 12/29/2012 10:00 | -12.0 | -13.3 | 90  |
| 7    |                  |       |       |     |

  

|      | Visibility_km | Press_kPa | Weather | Condtion |
|------|---------------|-----------|---------|----------|
| 0    | 8.0           | 101.24    |         | Fog      |
| 1    | 8.0           | 101.24    |         | Fog      |
| 4    | 4.8           | 101.23    |         | Fog      |
| 5    | 6.4           | 101.27    |         | Fog      |
| 6    | 6.4           | 101.29    |         | Fog      |
| ...  | ...           | ...       |         | ...      |
| 8716 | 9.7           | 101.25    |         | Fog      |
| 8717 | 6.4           | 101.25    |         | Fog      |
| 8718 | 9.7           | 101.25    |         | Fog      |
| 8719 | 8.0           | 101.22    |         | Fog      |
| 8722 | 6.4           | 101.15    |         | Fog      |

[150 rows x 8 columns]

Q14-> Find all the instances when "Weather is clear" or "Visibility is above 40"?

```
data[(data['Weather Condtion']=='Clear')|(data['Visibility_km']>40)]
```

|              | Date/Time      | Temp_C | Dew Point | Temp_C | Rel Hum_% | Wind |
|--------------|----------------|--------|-----------|--------|-----------|------|
| Speed_km/h \ |                |        |           |        |           |      |
| 67           | 1/3/2012 19:00 | -16.9  |           | -24.8  | 50        |      |
| 24           |                |        |           |        |           |      |
| 106          | 1/5/2012 10:00 | -6.0   |           | -10.0  | 73        |      |
| 17           |                |        |           |        |           |      |

```

107      1/5/2012 11:00      -5.6              -10.2          70
22
108      1/5/2012 12:00      -4.7              -9.6           69
20
109      1/5/2012 13:00      -4.4              -9.7           66
26
...
...
8749     12/30/2012 13:00     -12.4             -16.2          73
37
8750     12/30/2012 14:00     -11.8             -16.1          70
37
8751     12/30/2012 15:00     -11.3             -15.6          70
32
8752     12/30/2012 16:00     -11.4             -15.5          72
26
8756     12/30/2012 20:00     -13.8             -16.5          80
24

```

|      | Visibility_km | Press_kPa | Weather | Condtion |
|------|---------------|-----------|---------|----------|
| 67   | 25.0          | 101.74    |         | Clear    |
| 106  | 48.3          | 100.45    | Mainly  | Clear    |
| 107  | 48.3          | 100.41    | Mainly  | Clear    |
| 108  | 48.3          | 100.38    | Mainly  | Clear    |
| 109  | 48.3          | 100.40    | Mainly  | Clear    |
| ...  | ...           | ...       |         | ...      |
| 8749 | 48.3          | 100.92    | Mostly  | Cloudy   |
| 8750 | 48.3          | 100.96    | Mainly  | Clear    |
| 8751 | 48.3          | 101.05    | Mainly  | Clear    |
| 8752 | 48.3          | 101.15    | Mainly  | Clear    |
| 8756 | 25.0          | 101.52    |         | Clear    |

[3027 rows x 8 columns]

Q15-> Find all instances when-

##(Weather is clear and relative humudtiy is above 50) or visibility above 40

```

data[((data['Weather Condtion']=='Clear')&(data['Rel Hum_%']>50))|
(data['Visibility_km']>40)]

```

|              | Date/Time      | Temp_C | Dew Point | Temp_C | Rel Hum_% | Wind |
|--------------|----------------|--------|-----------|--------|-----------|------|
| Speed_km/h \ |                |        |           |        |           |      |
| 106          | 1/5/2012 10:00 | -6.0   |           | -10.0  | 73        |      |
| 17           |                |        |           |        |           |      |
| 107          | 1/5/2012 11:00 | -5.6   |           | -10.2  | 70        |      |
| 22           |                |        |           |        |           |      |
| 108          | 1/5/2012 12:00 | -4.7   |           | -9.6   | 69        |      |
| 20           |                |        |           |        |           |      |

|      |            |       |       |       |     |
|------|------------|-------|-------|-------|-----|
| 109  | 1/5/2012   | 13:00 | -4.4  | -9.7  | 66  |
| 26   |            |       |       |       |     |
| 110  | 1/5/2012   | 14:00 | -5.1  | -10.7 | 65  |
| 22   |            |       |       |       |     |
| ...  |            | ...   | ...   | ...   | ... |
| ...  |            |       |       |       |     |
| 8749 | 12/30/2012 | 13:00 | -12.4 | -16.2 | 73  |
| 37   |            |       |       |       |     |
| 8750 | 12/30/2012 | 14:00 | -11.8 | -16.1 | 70  |
| 37   |            |       |       |       |     |
| 8751 | 12/30/2012 | 15:00 | -11.3 | -15.6 | 70  |
| 32   |            |       |       |       |     |
| 8752 | 12/30/2012 | 16:00 | -11.4 | -15.5 | 72  |
| 26   |            |       |       |       |     |
| 8756 | 12/30/2012 | 20:00 | -13.8 | -16.5 | 80  |
| 24   |            |       |       |       |     |

|      | Visibility_km | Press_kPa | Weather | Condtion |
|------|---------------|-----------|---------|----------|
| 106  | 48.3          | 100.45    | Mainly  | Clear    |
| 107  | 48.3          | 100.41    | Mainly  | Clear    |
| 108  | 48.3          | 100.38    | Mainly  | Clear    |
| 109  | 48.3          | 100.40    | Mainly  | Clear    |
| 110  | 48.3          | 100.46    | Mainly  | Clear    |
| ...  | ...           | ...       | ...     | ...      |
| 8749 | 48.3          | 100.92    | Mostly  | Cloudy   |
| 8750 | 48.3          | 100.96    | Mainly  | Clear    |
| 8751 | 48.3          | 101.05    | Mainly  | Clear    |
| 8752 | 48.3          | 101.15    | Mainly  | Clear    |
| 8756 | 25.0          | 101.52    |         | Clear    |

[2921 rows x 8 columns]

Done with all analysis

Thanks !!!!!!!!!!!!!!!!!!!!!