

Untitled97 (1) (1)

June 18, 2023

```
[2]: import pandas as pd
```

```
[3]: data=pd.read_csv(r'C:/Users/Vikas/Desktop/Weather Data.csv') ## r is the ↵  
      ↪written remove the unicode error
```

```
[4]: data
```

```
[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 |
| 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]

```
[5]: ## before analysing data we sholud explore data  
data.head()
```

```
[5]:      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
```

```
[6]: ## i want to show the total number rows and col
data.shape
```

```
[6]: (8784, 8)
```

```
[7]: data.columns
```

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

```
[8]: data.dtypes
```

```
[8]: 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
```

```
[9]: ## i want to see the inside of col wat is there
data['Weather'].unique()
```

```
[9]: 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)
```

```
[10]: ## i want to see the numbers of unique values
data.nunique()
```

```
[10]: 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
```

```
[11]: ## i want to see non null vales the each col how much values
data.count()
```

```
[11]: 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
```

```
[12]: #3 i want to see perticular col same element how much repeat
data['Weather'].value_counts()
```

```
[12]: 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 | |

```
[13]: ## i want to see basic information about the dataframe
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

```

1 1, find the all unique " wind speed in the data"

```
[14]: data.head()
```

```

[14]:      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

```

```
[15]: data.nunique()
```

```

[15]: 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

```

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

```
[16]: 34
```

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

```
[17]: array([ 4,  7,  6,  9, 15, 13, 20, 22, 19, 24, 30, 35, 39, 32, 33, 26, 44,
        43, 48, 37, 28, 17, 11,  0, 83, 70, 57, 46, 41, 52, 50, 63, 54,  2],
      dtype=int64)
```

2 2,find the numbers of time weather is exactly clear

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

```
[18]: data.Weather.value_counts()
```

```
[18]: 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

```

```

[19]: #3 we can used filtering command
data[data.Weather=='Clear']

```

```

[19]:
      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]

```
[20]: ## useing group
data.groupby('Weather').get_group('Clear')
```

```
[20]:
```

| | 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]

3 find the numbers of times when the wind speed was exactly 4km

data.head(2)

```
[21]: ## we can used groupby
data.groupby('Wind Speed_km/h').get_group(4)
```

```
[21]:
```

| | 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]

```
[24]: we can used filterdata
data[data['Wind Speed_km/h']==4]
```

```
Cell In[24], line 1
    we can used filterdata
    ~
SyntaxError: invalid syntax
```

```
[23]: data.isnull().sum()
```

```
[23]: 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
```

4 rename the column name weathe of the dataframe to weather condition

```
[25]: data.head(2)
```

```
[25]:      Date/Time  Temp_C  Dew Point Temp_C  Rel Hum_%  Wind Speed_kmh \
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
```

```
[26]: data.rename(columns={'Weather':'Weather condition'},inplace=True)
```

```
[27]: data
```

```
[27]:      Date/Time  Temp_C  Dew Point Temp_C  Rel Hum_%  Wind Speed_kmh \
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 condition
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]
```

5 what is the mean by visibility col

```
[28]: data.head(2)
```

```
[28]:      Date/Time  Temp_C  Dew Point Temp_C  Rel Hum_%  Wind Speed_kmh \
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 condition
0              8.0     101.24              Fog
1              8.0     101.24              Fog
```

```
[29]: data.Visibility_km.mean()
```

```
[29]: 27.6644446721311478
```

6 what is the standard diviation pressure this data

```
[30]: data.Press_kPa.std()
```

```
[30]: 0.8440047459486474
```

7 what is the variance of ralative humidity in this data

```
[33]: data['Rel Hum_%'].var()      ## here center space between col that reason
    ↪used []
```

```
[33]: 286.2485501984998
```

```
[37]: data[data['Weather condition']=='Snow']
```

```
[37]:      Date/Time  Temp_C  Dew Point Temp_C  Rel Hum_%  Wind Speed_kmh \
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 condition
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]

```
[41]: data[data['Weather condition'].str.contains('Snow')].tail(25)
```

```
[41]:
```

| | Date/Time | Temp_C | Dew Point | Temp_C | Rel Hum_% | Wind Speed_km/h | \ |
|------|------------------|--------|-----------|--------|-----------|-----------------|---|
| 8735 | 12/29/2012 23:00 | -10.0 | | -12.0 | 85 | 20 | |
| 8736 | 12/30/2012 0:00 | -9.6 | | -11.3 | 87 | 13 | |
| 8737 | 12/30/2012 1:00 | -9.4 | | -10.5 | 92 | 9 | |
| 8738 | 12/30/2012 2:00 | -9.3 | | -10.4 | 92 | 9 | |
| 8739 | 12/30/2012 3:00 | -9.1 | | -10.4 | 90 | 11 | |
| 8740 | 12/30/2012 4:00 | -9.3 | | -10.6 | 90 | 13 | |
| 8741 | 12/30/2012 5:00 | -9.1 | | -10.4 | 90 | 11 | |
| 8742 | 12/30/2012 6:00 | -9.3 | | -10.8 | 89 | 17 | |
| 8767 | 12/31/2012 7:00 | -9.3 | | -11.3 | 85 | 0 | |
| 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 | |
| 8771 | 12/31/2012 11:00 | -6.7 | | -7.9 | 91 | 9 | |
| 8772 | 12/31/2012 12:00 | -5.8 | | -7.5 | 88 | 4 | |
| 8773 | 12/31/2012 13:00 | -4.6 | | -6.6 | 86 | 4 | |
| 8774 | 12/31/2012 14:00 | -3.4 | | -5.7 | 84 | 6 | |
| 8775 | 12/31/2012 15:00 | -2.3 | | -4.6 | 84 | 9 | |
| 8776 | 12/31/2012 16:00 | -1.4 | | -4.0 | 82 | 13 | |
| 8777 | 12/31/2012 17:00 | -1.1 | | -3.3 | 85 | 19 | |
| 8778 | 12/31/2012 18:00 | -1.3 | | -3.1 | 88 | 17 | |
| 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 condition |
|------|---------------|-----------|-------------------|
| 8735 | 6.4 | 100.19 | Snow,Fog |
| 8736 | 3.2 | 100.23 | Snow,Fog |
| 8737 | 2.4 | 100.22 | Snow,Fog |
| 8738 | 4.0 | 100.28 | Snow,Fog |

| | | | |
|------|------|--------|--------------|
| 8739 | 3.6 | 100.30 | Snow,Fog |
| 8740 | 9.7 | 100.28 | Snow,Fog |
| 8741 | 4.0 | 100.32 | Snow,Fog |
| 8742 | 8.0 | 100.39 | Snow,Fog |
| 8767 | 19.3 | 101.19 | Snow Showers |
| 8768 | 3.2 | 101.14 | Snow Showers |
| 8769 | 2.4 | 101.09 | Snow |
| 8770 | 6.4 | 101.05 | Snow,Fog |
| 8771 | 9.7 | 100.93 | Snow |
| 8772 | 12.9 | 100.78 | Snow |
| 8773 | 12.9 | 100.63 | Snow |
| 8774 | 11.3 | 100.57 | Snow |
| 8775 | 9.7 | 100.47 | Snow |
| 8776 | 12.9 | 100.40 | Snow |
| 8777 | 9.7 | 100.30 | Snow |
| 8778 | 9.7 | 100.19 | 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 |

8 find the all instances when speed is above 24 and visibility is 25

```
[42]: data.head(2)
```

```
[42]:      Date/Time  Temp_C  Dew Point Temp_C  Rel Hum_%  Wind Speed_kmh \
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 condition
0              8.0      101.24              Fog
1              8.0      101.24              Fog
```

```
[44]: data[(data['Wind Speed_kmh']>24)& (data['Visibility_km']==25)]
```

```
[44]:      Date/Time  Temp_C  Dew Point Temp_C  Rel Hum_%  Wind Speed_kmh \
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 condition |
|------|---------------|-----------|-------------------|
| 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]

9 wat is the mean values of each col against each 'weather condition'

```
[47]: data.groupby('Weather condition').mean()
```

C:\Users\Vikas\AppData\Local\Temp\ipykernel_19652\3369097005.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 condition').mean()
```

```
[47]:
```

| Weather condition | Temp_C | Dew Point | Temp_C \ |
|-------------------------|-----------|-----------|----------|
| 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 condition | | |
| 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 condition | | |
| 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

```
[48]: data.groupby('Weather condition').min()
```

```
[48]:
```

| | Date/Time | Temp_C | \ |
|-------------------------------|------------------|--------|---|
| Weather condition | | | |
| Clear | 1/11/2012 1:00 | -23.3 | |
| Cloudy | 1/1/2012 17:00 | -21.4 | |
| Drizzle | 1/23/2012 21:00 | 1.1 | |
| Drizzle,Fog | 1/23/2012 20:00 | 0.0 | |
| Drizzle,Ice Pellets,Fog | 12/17/2012 9:00 | 0.4 | |
| Drizzle,Snow | 12/17/2012 15:00 | 0.9 | |
| Drizzle,Snow,Fog | 12/18/2012 21:00 | 0.3 | |
| Fog | 1/1/2012 0:00 | -16.0 | |
| Freezing Drizzle | 1/13/2012 10:00 | -9.0 | |
| Freezing Drizzle,Fog | 1/1/2012 2:00 | -6.4 | |
| Freezing Drizzle,Haze | 2/1/2012 11:00 | -5.8 | |
| Freezing Drizzle,Snow | 1/13/2012 3:00 | -8.3 | |
| Freezing Fog | 1/22/2012 6:00 | -19.0 | |
| Freezing Rain | 1/13/2012 11:00 | -6.5 | |
| 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 |

| Weather condition | Dew Point Temp_C | Rel Hum_% \ |
|-------------------------------|------------------|-------------|
| 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 |

| Weather condition | Wind Speed_km/h | Visibility_km \ |
|-------------------------------|-----------------|-----------------|
| 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 condition | |
| 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 |

```
[51]: data.groupby('Weather condition').max()
```

```
[51]:
```

| | Date/Time | Temp_C | \ |
|-------------------------|------------------|--------|---|
| Weather condition | | | |
| 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 |

| Weather condition | Dew Point Temp_C | Rel Hum_% \ |
|-------------------------|------------------|-------------|
| 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 |

| Weather condition | Wind Speed_km/h | Visibility_km \ |
|-------------------|-----------------|-----------------|
| 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 |

| Weather condition | Press_kPa |
|-------------------------------|-----------|
| 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 |

10 shows the all the records weather condition is fog

```
[53]: data[data['Weather condition'].str.contains('Snow,Fog')]
```

```
[53]:
```

| | Date/Time | Temp_C | Dew Point | Temp_C | Rel Hum_% | Wind Speed_km/h | \ |
|------|------------------|--------|-----------|--------|-----------|-----------------|---|
| 983 | 2/10/2012 23:00 | -0.9 | | -2.4 | 90 | 6 | |
| 984 | 2/11/2012 0:00 | -1.4 | | -2.3 | 94 | 9 | |
| 1311 | 2/24/2012 15:00 | 1.0 | | -2.6 | 77 | 19 | |
| 1312 | 2/24/2012 16:00 | -0.1 | | -1.6 | 90 | 22 | |
| 1762 | 3/14/2012 10:00 | 1.1 | | 0.5 | 96 | 7 | |
| 1763 | 3/14/2012 11:00 | 0.4 | | 0.1 | 98 | 6 | |
| 1764 | 3/14/2012 12:00 | 1.0 | | 0.8 | 99 | 4 | |
| 1771 | 3/14/2012 19:00 | 0.3 | | -0.2 | 96 | 15 | |
| 8229 | 12/8/2012 21:00 | 0.8 | | 0.3 | 96 | 9 | |
| 8415 | 12/16/2012 15:00 | -7.6 | | -9.4 | 87 | 32 | |
| 8416 | 12/16/2012 16:00 | -7.0 | | -8.7 | 88 | 35 | |
| 8417 | 12/16/2012 17:00 | -6.4 | | -8.0 | 88 | 30 | |
| 8418 | 12/16/2012 18:00 | -5.9 | | -7.4 | 89 | 30 | |
| 8434 | 12/17/2012 10:00 | 0.5 | | -0.8 | 91 | 20 | |
| 8435 | 12/17/2012 11:00 | 0.4 | | -0.4 | 94 | 19 | |
| 8436 | 12/17/2012 12:00 | 0.4 | | -0.3 | 95 | 22 | |
| 8437 | 12/17/2012 13:00 | 0.6 | | -0.1 | 95 | 17 | |
| 8438 | 12/17/2012 14:00 | 0.8 | | 0.1 | 95 | 19 | |
| 8469 | 12/18/2012 21:00 | 1.0 | | 0.6 | 97 | 13 | |
| 8470 | 12/18/2012 22:00 | 0.8 | | 0.4 | 97 | 15 | |
| 8471 | 12/18/2012 23:00 | 0.8 | | 0.5 | 98 | 11 | |
| 8472 | 12/19/2012 0:00 | 0.6 | | 0.2 | 97 | 9 | |
| 8473 | 12/19/2012 1:00 | 0.5 | | 0.1 | 97 | 7 | |
| 8474 | 12/19/2012 2:00 | 0.4 | | 0.1 | 98 | 7 | |
| 8475 | 12/19/2012 3:00 | 0.4 | | 0.0 | 97 | 9 | |
| 8476 | 12/19/2012 4:00 | 0.4 | | 0.0 | 97 | 11 | |
| 8477 | 12/19/2012 5:00 | 0.3 | | -0.1 | 97 | 11 | |
| 8478 | 12/19/2012 6:00 | 0.4 | | -0.1 | 96 | 9 | |
| 8479 | 12/19/2012 7:00 | 0.4 | | 0.0 | 97 | 11 | |
| 8491 | 12/19/2012 19:00 | 0.8 | | 0.3 | 96 | 11 | |
| 8492 | 12/19/2012 20:00 | 0.7 | | 0.1 | 96 | 11 | |
| 8543 | 12/21/2012 23:00 | 1.1 | | 0.0 | 92 | 30 | |
| 8544 | 12/22/2012 0:00 | 1.1 | | -0.1 | 92 | 32 | |
| 8546 | 12/22/2012 2:00 | 1.1 | | 0.1 | 93 | 30 | |

| | | | | | |
|------|------------------|-------|-------|----|----|
| 8547 | 12/22/2012 3:00 | 1.1 | 0.1 | 93 | 28 |
| 8726 | 12/29/2012 14:00 | -9.3 | -10.5 | 91 | 22 |
| 8727 | 12/29/2012 15:00 | -8.8 | -10.0 | 91 | 20 |
| 8728 | 12/29/2012 16:00 | -8.5 | -9.9 | 90 | 24 |
| 8729 | 12/29/2012 17:00 | -9.0 | -10.4 | 90 | 19 |
| 8730 | 12/29/2012 18:00 | -9.3 | -10.9 | 88 | 26 |
| 8731 | 12/29/2012 19:00 | -9.5 | -11.2 | 87 | 26 |
| 8732 | 12/29/2012 20:00 | -9.7 | -11.6 | 86 | 24 |
| 8733 | 12/29/2012 21:00 | -9.8 | -11.8 | 85 | 24 |
| 8734 | 12/29/2012 22:00 | -10.1 | -11.6 | 89 | 15 |
| 8735 | 12/29/2012 23:00 | -10.0 | -12.0 | 85 | 20 |
| 8736 | 12/30/2012 0:00 | -9.6 | -11.3 | 87 | 13 |
| 8737 | 12/30/2012 1:00 | -9.4 | -10.5 | 92 | 9 |
| 8738 | 12/30/2012 2:00 | -9.3 | -10.4 | 92 | 9 |
| 8739 | 12/30/2012 3:00 | -9.1 | -10.4 | 90 | 11 |
| 8740 | 12/30/2012 4:00 | -9.3 | -10.6 | 90 | 13 |
| 8741 | 12/30/2012 5:00 | -9.1 | -10.4 | 90 | 11 |
| 8742 | 12/30/2012 6:00 | -9.3 | -10.8 | 89 | 17 |
| 8770 | 12/31/2012 10:00 | -7.4 | -8.9 | 89 | 4 |

| | Visibility_km | Press_kPa | Weather condition |
|------|---------------|-----------|-------------------|
| 983 | 9.7 | 100.76 | Snow,Fog |
| 984 | 6.4 | 100.78 | Snow,Fog |
| 1311 | 6.4 | 99.53 | Snow,Fog |
| 1312 | 1.2 | 99.38 | Snow,Fog |
| 1762 | 2.4 | 101.57 | Snow,Fog |
| 1763 | 1.6 | 101.60 | Snow,Fog |
| 1764 | 2.0 | 101.65 | Snow,Fog |
| 1771 | 8.0 | 102.07 | Snow,Fog |
| 8229 | 6.4 | 100.73 | Rain,Snow,Fog |
| 8415 | 3.2 | 101.38 | Snow,Fog |
| 8416 | 4.0 | 101.33 | Snow,Fog |
| 8417 | 4.8 | 101.28 | Snow,Fog |
| 8418 | 4.0 | 101.25 | Snow,Fog |
| 8434 | 3.6 | 100.78 | Snow,Fog |
| 8435 | 1.6 | 100.76 | Snow,Fog |
| 8436 | 2.0 | 100.71 | Snow,Fog |
| 8437 | 4.8 | 100.66 | Snow,Fog |
| 8438 | 4.0 | 100.65 | Snow,Fog |
| 8469 | 3.2 | 99.58 | Drizzle,Snow,Fog |
| 8470 | 3.2 | 99.60 | Drizzle,Snow,Fog |
| 8471 | 3.2 | 99.64 | Drizzle,Snow,Fog |
| 8472 | 4.0 | 99.65 | Drizzle,Snow,Fog |
| 8473 | 6.4 | 99.71 | Drizzle,Snow,Fog |
| 8474 | 8.0 | 99.78 | Drizzle,Snow,Fog |
| 8475 | 4.8 | 99.82 | Drizzle,Snow,Fog |
| 8476 | 4.0 | 99.87 | Drizzle,Snow,Fog |

| | | | |
|------|-----|--------|------------------|
| 8477 | 3.2 | 99.95 | Drizzle,Snow,Fog |
| 8478 | 2.4 | 100.05 | Drizzle,Snow,Fog |
| 8479 | 3.2 | 100.15 | Drizzle,Snow,Fog |
| 8491 | 4.8 | 101.26 | Snow,Fog |
| 8492 | 6.4 | 101.32 | Snow,Fog |
| 8543 | 9.7 | 97.79 | Drizzle,Snow,Fog |
| 8544 | 9.7 | 97.81 | Drizzle,Snow,Fog |
| 8546 | 8.0 | 97.89 | Drizzle,Snow,Fog |
| 8547 | 9.7 | 97.93 | Drizzle,Snow,Fog |
| 8726 | 4.8 | 100.60 | Snow,Fog |
| 8727 | 1.2 | 100.55 | Snow,Fog |
| 8728 | 1.2 | 100.49 | Snow,Fog |
| 8729 | 2.4 | 100.46 | Snow,Fog |
| 8730 | 6.4 | 100.38 | Snow,Fog |
| 8731 | 3.2 | 100.33 | Snow,Fog |
| 8732 | 9.7 | 100.25 | Snow,Fog |
| 8733 | 8.0 | 100.24 | Snow,Fog |
| 8734 | 2.4 | 100.20 | Snow,Fog |
| 8735 | 6.4 | 100.19 | Snow,Fog |
| 8736 | 3.2 | 100.23 | Snow,Fog |
| 8737 | 2.4 | 100.22 | Snow,Fog |
| 8738 | 4.0 | 100.28 | Snow,Fog |
| 8739 | 3.6 | 100.30 | Snow,Fog |
| 8740 | 9.7 | 100.28 | Snow,Fog |
| 8741 | 4.0 | 100.32 | Snow,Fog |
| 8742 | 8.0 | 100.39 | Snow,Fog |
| 8770 | 6.4 | 101.05 | Snow,Fog |

11 3 find the instance when 'weather is clear' and visibility is above 40

```
[56]: data[(data['Weather condition']=='Clear') | (data['Visibility_km']>40)].head(50)
```

```
[56]:
```

| | 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 | |
| 110 | 1/5/2012 14:00 | -5.1 | | -10.7 | 65 | 22 | |
| 111 | 1/5/2012 15:00 | -4.3 | | -12.0 | 55 | 26 | |
| 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 | |
| 183 | 1/8/2012 15:00 | -6.6 | | -12.9 | 61 | 20 | |

| | | | | | |
|-----|-----------------|-------|-------|----|----|
| 241 | 1/11/2012 1:00 | -10.7 | -17.8 | 56 | 17 |
| 242 | 1/11/2012 2:00 | -12.0 | -18.9 | 56 | 19 |
| 243 | 1/11/2012 3:00 | -12.7 | -19.4 | 57 | 19 |
| 244 | 1/11/2012 4:00 | -13.4 | -20.1 | 57 | 17 |
| 324 | 1/14/2012 12:00 | -17.5 | -23.8 | 58 | 20 |
| 325 | 1/14/2012 13:00 | -17.1 | -24.1 | 55 | 17 |
| 326 | 1/14/2012 14:00 | -16.7 | -23.4 | 56 | 17 |
| 327 | 1/14/2012 15:00 | -16.7 | -23.4 | 56 | 22 |
| 344 | 1/15/2012 8:00 | -23.3 | -28.5 | 62 | 7 |
| 345 | 1/15/2012 9:00 | -22.2 | -27.8 | 60 | 9 |
| 346 | 1/15/2012 10:00 | -20.6 | -26.8 | 58 | 9 |
| 347 | 1/15/2012 11:00 | -19.3 | -26.1 | 55 | 9 |
| 348 | 1/15/2012 12:00 | -18.0 | -25.5 | 52 | 13 |
| 349 | 1/15/2012 13:00 | -16.8 | -24.2 | 53 | 20 |
| 350 | 1/15/2012 14:00 | -16.0 | -23.4 | 53 | 26 |
| 351 | 1/15/2012 15:00 | -15.4 | -22.8 | 53 | 24 |
| 352 | 1/15/2012 16:00 | -15.1 | -22.8 | 52 | 24 |
| 353 | 1/15/2012 17:00 | -16.2 | -23.2 | 55 | 15 |
| 354 | 1/15/2012 18:00 | -16.3 | -22.9 | 57 | 17 |
| 355 | 1/15/2012 19:00 | -16.3 | -22.7 | 58 | 20 |
| 356 | 1/15/2012 20:00 | -16.7 | -22.4 | 61 | 17 |
| 357 | 1/15/2012 21:00 | -16.9 | -22.2 | 63 | 15 |
| 358 | 1/15/2012 22:00 | -16.9 | -21.7 | 66 | 17 |
| 359 | 1/15/2012 23:00 | -16.9 | -21.4 | 68 | 15 |
| 360 | 1/16/2012 0:00 | -17.1 | -21.9 | 66 | 15 |
| 361 | 1/16/2012 1:00 | -17.8 | -22.7 | 65 | 6 |
| 362 | 1/16/2012 2:00 | -18.5 | -23.0 | 68 | 6 |
| 363 | 1/16/2012 3:00 | -19.2 | -23.8 | 67 | 6 |
| 364 | 1/16/2012 4:00 | -18.7 | -23.5 | 66 | 0 |
| 365 | 1/16/2012 5:00 | -19.1 | -23.3 | 69 | 0 |
| 366 | 1/16/2012 6:00 | -18.7 | -23.2 | 68 | 0 |
| 367 | 1/16/2012 7:00 | -17.9 | -21.5 | 73 | 4 |
| 368 | 1/16/2012 8:00 | -17.9 | -22.6 | 67 | 9 |
| 369 | 1/16/2012 9:00 | -14.4 | -20.7 | 59 | 22 |
| 370 | 1/16/2012 10:00 | -13.6 | -18.7 | 65 | 19 |
| 371 | 1/16/2012 11:00 | -12.7 | -17.7 | 66 | 20 |
| 372 | 1/16/2012 12:00 | -10.7 | -16.9 | 60 | 19 |
| 373 | 1/16/2012 13:00 | -10.1 | -16.1 | 61 | 13 |

| | Visibility_km | Press_kPa | Weather condition |
|-----|---------------|-----------|-------------------|
| 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 |
| 110 | 48.3 | 100.46 | Mainly Clear |
| 111 | 48.3 | 100.52 | Mainly 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 |
| 183 | 48.3 | 102.04 | Mostly Cloudy |
| 241 | 25.0 | 101.49 | Clear |
| 242 | 25.0 | 101.57 | Clear |
| 243 | 25.0 | 101.64 | Clear |
| 244 | 25.0 | 101.66 | Clear |
| 324 | 48.3 | 101.16 | Mostly Cloudy |
| 325 | 48.3 | 101.18 | Mainly Clear |
| 326 | 48.3 | 101.20 | Mostly Cloudy |
| 327 | 48.3 | 101.24 | Mostly Cloudy |
| 344 | 24.1 | 102.45 | Clear |
| 345 | 48.3 | 102.57 | Mainly Clear |
| 346 | 48.3 | 102.66 | Mainly Clear |
| 347 | 48.3 | 102.68 | Mainly Clear |
| 348 | 48.3 | 102.67 | Mainly Clear |
| 349 | 48.3 | 102.65 | Mainly Clear |
| 350 | 48.3 | 102.66 | Mainly Clear |
| 351 | 48.3 | 102.71 | Clear |
| 352 | 48.3 | 102.79 | Clear |
| 353 | 25.0 | 102.85 | Clear |
| 354 | 25.0 | 102.89 | Clear |
| 355 | 25.0 | 102.94 | Clear |
| 356 | 25.0 | 102.98 | Clear |
| 357 | 25.0 | 103.02 | Clear |
| 358 | 25.0 | 103.07 | Clear |
| 359 | 25.0 | 103.09 | Clear |
| 360 | 25.0 | 103.09 | Clear |
| 361 | 25.0 | 103.05 | Clear |
| 362 | 25.0 | 103.08 | Clear |
| 363 | 25.0 | 103.07 | Clear |
| 364 | 25.0 | 103.05 | Clear |
| 365 | 25.0 | 103.02 | Clear |
| 366 | 25.0 | 103.01 | Clear |
| 367 | 48.3 | 102.96 | Mainly Clear |
| 368 | 48.3 | 102.90 | Mostly Cloudy |
| 369 | 48.3 | 102.75 | Cloudy |
| 370 | 48.3 | 102.62 | Mostly Cloudy |
| 371 | 48.3 | 102.44 | Mostly Cloudy |
| 372 | 48.3 | 102.17 | Mostly Cloudy |
| 373 | 48.3 | 101.92 | Cloudy |

12 weather is clear and relative humidity is greater then 50 or visibility is above 40

```
[57]: data.head(2)
```

```
[57]:      Date/Time  Temp_C  Dew Point Temp_C  Rel Hum_%  Wind Speed_kmh  \
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 condition
0              8.0     101.24              Fog
1              8.0     101.24              Fog
```

```
[59]: data[(data['Weather condition']=='Clear') & (data['Rel Hum_%']>50)|
      ↪(data['Visibility_km']>40)].head(30)
```

```
[59]:      Date/Time  Temp_C  Dew Point Temp_C  Rel Hum_%  Wind Speed_kmh  \
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
111  1/5/2012 15:00    -4.3         -12.0        55             26
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
183  1/8/2012 15:00    -6.6         -12.9        61             20
241  1/11/2012 1:00   -10.7         -17.8        56             17
242  1/11/2012 2:00   -12.0         -18.9        56             19
243  1/11/2012 3:00   -12.7         -19.4        57             19
244  1/11/2012 4:00   -13.4         -20.1        57             17
324  1/14/2012 12:00   -17.5         -23.8        58             20
325  1/14/2012 13:00   -17.1         -24.1        55             17
326  1/14/2012 14:00   -16.7         -23.4        56             17
327  1/14/2012 15:00   -16.7         -23.4        56             22
344  1/15/2012 8:00   -23.3         -28.5        62              7
345  1/15/2012 9:00   -22.2         -27.8        60              9
346  1/15/2012 10:00  -20.6         -26.8        58              9
347  1/15/2012 11:00  -19.3         -26.1        55              9
348  1/15/2012 12:00  -18.0         -25.5        52             13
349  1/15/2012 13:00  -16.8         -24.2        53             20
350  1/15/2012 14:00  -16.0         -23.4        53             26
351  1/15/2012 15:00  -15.4         -22.8        53             24
352  1/15/2012 16:00  -15.1         -22.8        52             24
353  1/15/2012 17:00  -16.2         -23.2        55             15
354  1/15/2012 18:00  -16.3         -22.9        57             17
```


| | Visibility_km | Press_kPa | Weather condition |
|-----|---------------|-----------|-------------------|
| 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 |
| 111 | 48.3 | 100.52 | Mainly 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 |
| 183 | 48.3 | 102.04 | Mostly Cloudy |
| 241 | 25.0 | 101.49 | Clear |
| 242 | 25.0 | 101.57 | Clear |
| 243 | 25.0 | 101.64 | Clear |
| 244 | 25.0 | 101.66 | Clear |
| 324 | 48.3 | 101.16 | Mostly Cloudy |
| 325 | 48.3 | 101.18 | Mainly Clear |
| 326 | 48.3 | 101.20 | Mostly Cloudy |
| 327 | 48.3 | 101.24 | Mostly Cloudy |
| 344 | 24.1 | 102.45 | Clear |
| 345 | 48.3 | 102.57 | Mainly Clear |
| 346 | 48.3 | 102.66 | Mainly Clear |
| 347 | 48.3 | 102.68 | Mainly Clear |
| 348 | 48.3 | 102.67 | Mainly Clear |
| 349 | 48.3 | 102.65 | Mainly Clear |
| 350 | 48.3 | 102.66 | Mainly Clear |
| 351 | 48.3 | 102.71 | Clear |
| 352 | 48.3 | 102.79 | Clear |
| 353 | 25.0 | 102.85 | Clear |
| 354 | 25.0 | 102.89 | Clear |

[]: