

WEATHER DATASET (Data Analytics Project)

The commands that I used in this project :

- head() - It shows the first N rows in the data (by default, N=5).
- shape - It shows the total no. of rows and no. of columns of the dataframe
- index - This attribute provides the index of the dataframe
- columns - It shows the name of each column
- dtypes - It shows the data-type of each column
- unique() - In a column, it shows all the unique values. It can be applied on a single column only, not on the whole dataframe.
- nunique() - It shows the total no. of unique values in each column. It can be applied on a single column as well as on the whole dataframe.
- count - It shows the total no. of non-null values in each column. It can be applied on a single column as well as on the whole dataframe.
- value_counts - In a column, it shows all the unique values with their count. It can be applied on a single column only.
- info() - Provides basic information about the dataframe.

Done by Gujarathi Bhavani

```
In [6]: import pandas as pd  
data=pd.read_csv(r"C:\Users\BHAVANI\Desktop\Weather Data.csv")  
data
```

Out[6]:

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

8784 rows × 8 columns

.head()

In [11]: `data.head() #it shows the first N rows in the data(by default,N=5)`

Out[11]:

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

In [12]: `data.head(15)`

Out[12]:

	Date/Time	Temp_C	Dew Point Temp_C	Rel Hum_%	Wind Speed_km/h	Visibility_km	Press_kPa	Weather
0	01-01-2012 00:00	-1.8	-3.9	86	4	8.0	101.24	Fog
1	01-01-2012 01:00	-1.8	-3.7	87	4	8.0	101.24	Fog
2	01-01-2012 02:00	-1.8	-3.4	89	7	4.0	101.26	Freezing Drizzle,Fog
3	01-01-2012 03:00	-1.5	-3.2	88	6	4.0	101.27	Freezing Drizzle,Fog
4	01-01-2012 04:00	-1.5	-3.3	88	7	4.8	101.23	Fog
5	01-01-2012 05:00	-1.4	-3.3	87	9	6.4	101.27	Fog
6	01-01-2012 06:00	-1.5	-3.1	89	7	6.4	101.29	Fog
7	01-01-2012 07:00	-1.4	-3.6	85	7	8.0	101.26	Fog
8	01-01-2012 08:00	-1.4	-3.6	85	9	8.0	101.23	Fog
9	01-01-2012 09:00	-1.3	-3.1	88	15	4.0	101.20	Fog
10	01-01-2012 10:00	-1.0	-2.3	91	9	1.2	101.15	Fog
11	01-01-2012 11:00	-0.5	-2.1	89	7	4.0	100.98	Fog
12	01-01-2012 12:00	-0.2	-2.0	88	9	4.8	100.79	Fog
13	01-01-2012 13:00	0.2	-1.7	87	13	4.8	100.58	Fog
14	01-01-2012 14:00	0.8	-1.1	87	20	4.8	100.31	Fog

.shape

In [13]: `data.shape #it shows the total no.of rows and no.of columns of the dataframe`Out[13]: `(8784, 8)`

.index

In [14]: `data.index # this attribute provides the index of the dataframe`

```
Out[14]: RangeIndex(start=0, stop=8784, step=1)
```

.columns

```
In [16]: data.columns #it shows the name of each column
```

```
Out[16]: Index(['Date/Time', 'Temp_C', 'Dew Point Temp_C', 'Rel Hum_%',
       'Wind Speed_km/h', 'Visibility_km', 'Press_kPa', 'Weather'],
      dtype='object')
```

.dtypes

It shows the data-type of each column.

```
In [17]: data.dtypes
```

```
Out[17]: Date/Time          object
Temp_C            float64
Dew Point Temp_C    float64
Rel Hum_%         int64
Wind Speed_km/h     int64
Visibility_km      float64
Press_kPa          float64
Weather            object
dtype: object
```

.unique()

In a column, it shows all the unique values. It can applied on a single column only, not on the whole dataframes

```
In [20]: data['Weather'].unique()
```

```
Out[20]: array(['Fog', 'Freezing Drizzle,Fog', 'Mostly Cloudy', 'Cloudy', 'Rain',  
   'Rain Showers', 'Mainly Clear', 'Snow Showers', 'Snow', 'Clear',  
   'Freezing Rain,Fog', 'Freezing Rain', 'Freezing Drizzle',  
   'Rain,Snow', 'Moderate Snow', 'Freezing Drizzle,Snow',  
   'Freezing Rain,Snow Grains', 'Snow,Blowing Snow', 'Freezing Fog',  
   'Haze', 'Rain,Fog', 'Drizzle,Fog', 'Drizzle',  
   'Freezing Drizzle,Haze', 'Freezing Rain,Haze', 'Snow,Haze',  
   'Snow,Fog', 'Snow,Ice Pellets', 'Rain,Haze', 'Thunderstorms,Rain',  
   'Thunderstorms,Rain Showers', 'Thunderstorms,Heavy Rain Showers',  
   'Thunderstorms,Rain Showers,Fog', 'Thunderstorms',  
   'Thunderstorms,Rain,Fog',  
   'Thunderstorms,Moderate Rain Showers,Fog', 'Rain Showers,Fog',  
   'Rain Showers,Snow Showers', 'Snow Pellets', 'Rain,Snow,Fog',  
   'Moderate Rain,Fog', 'Freezing Rain,Ice Pellets,Fog',  
   'Drizzle,Ice Pellets,Fog', 'Drizzle,Snow', 'Rain,Ice Pellets',  
   'Drizzle,Snow,Fog', 'Rain,Snow Grains', 'Rain,Snow,Ice Pellets',  
   'Snow Showers,Fog', 'Moderate Snow,Blowing Snow'], dtype=object)
```

```
In [22]: data['Temp_C'].unique()
```

```
Out[22]: array([-1.8, -1.5, -1.4, -1.3, -1. , -0.5, -0.2,  0.2,  0.8,
  1.8,  2.6,  3. ,  3.8,  3.1,  3.2,  4. ,  4.4,  5.3,
  5.2,  4.6,  3.9,  3.7,  2.9,  2.3,  2. ,  1.9,  1.5,
  2.2,  1.7,  1.1,  0. , -0.7, -2.1, -4.1, -4.8, -5.6,
 -5.8, -7. , -7.4, -9. , -9.7, -10.5, -11.3, -12.6, -12.9,
-13.3, -14. , -14.8, -15. , -15.3, -14.9, -15.1, -15.8, -16.3,
-16.9, -17.3, -17. , -17.1, -17.5, -17.9, -18.1, -18.5, -18.6,
-18.2, -17.8, -16.8, -15.2, -14.2, -13.7, -12.4, -10.2, -9.4,
 -8.9, -8.4, -7.8, -7.6, -9.5, -9.6, -8.8, -7.5, -5.4,
 -5. , -8.2, -7.1, -6.1, -6.6, -6. , -4.7, -4.4, -5.1,
 -4.3, -6.7, -9.2, -9.8, -9.9, -10. , -10.6, -11.8, -12. ,
-14.4, -12.3, -12.5, -11.7, -11.9, -11.2, -11.5, -11.6, -9.3,
 -8.7, -8.5, -8.1, -6.9, -6.4, -5.7, -5.5, -3.7, -3.6,
 -3.1, -3.2, -3. ,  0.4,  0.6, -0.6, -1.7, -3.5, -5.9,
 -6.5, -7.2, -8. , -8.3, -7.7, -6.8, -2.5, -1.1, -0.3,
  2.5,  1.4,  1.6,  1.2,  0.7, -4. , -4.9, -7.3, -8.6,
-10.7, -12.7, -13.4, -13.9, -14.7, -14.3, -12.2, -11.4, -10.8,
 -6.2, -5.2, -4.6, -4.5, -2.9, -18. , -16.7, -17.4, -17.7,
-18.3, -19.6, -20. , -19.9, -20.3, -21.2, -21.1, -21.4, -20.7,
-21. , -21.3, -23.2, -22.8, -23.3, -22.2, -20.6, -19.3, -16. ,
-15.4, -16.2, -19.2, -18.7, -19.1, -13.6, -10.1, -10.4, -5.3,
 -3.3, -1.6,  2.1,  0.5, -10.9, -11.1, -11. , -10.3, -16.6,
-14.6, -4.2, -3.9, -6.3, -15.5, -15.9, -16.4, -16.1, -12.1,
-13. , -17.6, -18.4, -17.2, -19.5, -19. , -14.5, -13.2,  2.7,
  3.3,  3.6,  3.5,  5. ,  4.2,  3.4,  2.8,  2.4,  1.3,
  1. , -0.1, -0.4, -2.8, -7.9, -3.4, -3.8, -0.8,  0.3,
  0.1, -1.2,  0.9, -0.9, -2. , -1.9, -2.2, -2.3, -15.7,
-13.5, -13.8, -2.4, -13.1, -12.8, -2.7,  5.8,  6.1,  5.4,
  6.5,  4.3,  6.4,  8.9,  9.3,  9.7, 11.4,  9.9,  5.5,
  6. ,  7.6,  6.8,  4.8,  6.2,  7.9, 10.1, 10. ,  5.7,
 10.3,  6.7, 10.2, 12.1, 12.7, 11.7, 11.5, 11.6, 11.3,
 10.5, -2.6,  5.9,  9. ,  9.5, 10.9, 10.7,  9.1,  7.4,
  8.3, 10.6, 10.8, 12.3, 12.4, 11.8,  8.7,  9.2,  8.4,
  6.6,  7.5,  5.1,  4.9,  4.1,  8.1,  9.8,  8.8,  7.7,
 10.4, 11.9, 14.1, 17.3, 20. , 21.7, 22.2, 22.7, 21.8,
 18.4, 17.1, 12.8, 13.4, 12.6, 11.2, 13.9, 15.6, 17.8,
 19.8, 18.5, 17. , 16.3, 16.6, 15.9, 12.5,  7.2,  7.1,
  8. , 14.9, 16.5, 21.5, 22.5, 23.3, 22. , 19.7, 17.5,
 18.1, 16. , 14.2, 14.3, 14. , 13.8, 18.2, 20.2, 22.3,
 23.8, 24.7, 25.4, 25.5, 25.2, 20.7, 17.2, 16.4, 18. ,
 15.5, 15. , 11. , 13.2, 13.7, 15.4, 19.6, 20.4, 23. ,
 22.8, 21.4, 16.7, 15.1, 14.5, 16.2, 16.8, 14.7,  7.3,
  4.7,  6.3,  4.5,  8.2,  7. ,  6.9,  7.8,  5.6,  8.5,
  8.6,  9.4, 12.2, 13.5, 16.1, 13.6, 15.3, 14.8, 12. ,
 12.9, 13.1, 19.4, 14.6, 15.7, 14.4, 15.2, 19.3, 24.9,
```

weather dataset

```
24.1, 24.8, 26.6, 27.4, 27.8, 27.3, 26.7, 26.4, 20.5,
19.5, 19. , 18.9, 17.4, 11.1, 15.8, 18.7, 9.6, 13. ,
13.3, 16.9, 20.1, 20.6, 20.9, 21. , 19.9, 19.2, 17.6,
17.9, 18.6, 22.4, 23.9, 23.6, 18.8, 21.2, 21.9, 23.2,
23.4, 23.5, 22.9, 18.3, 20.3, 20.8, 17.7, 19.1, 25.6,
25.8, 26. , 24.3, 21.6, 26.8, 28.6, 29.5, 30.9, 31.2,
30.8, 29.2, 26.9, 25.9, 24. , 28. , 28.4, 28.8, 28.9,
28.2, 27.7, 26.5, 21.1, 24.6, 26.1, 27.1, 27.6, 28.1,
24.4, 23.1, 27.2, 26.2, 21.3, 22.1, 22.6, 24.2, 23.7,
25.3, 28.7, 29.4, 30.1, 29.6, 29.1, 25. , 24.5, 25.7,
27. , 27.9, 26.3, 28.5, 29.7, 31.7, 32.2, 32.3, 32.4,
30.6, 25.1, 31.8, 31.6, 32.6, 33. , 32.5, 32.1, 31.1,
30.3, 27.5, 29. , 29.8, 30.7, 30.2, 29.9, 28.3, 30.5,
30.4, 31.9, 31.4, 32.7, 32.9, 31.5, 29.3, 30. , 32. ,
32.8, -9.1])
```

.nunique()

It shows the total no.of unique values values in each column. It can be applied on a single column as well as on whole dataframe.

In [26]: `data.nunique()`

Out[26]:

Date/Time	8784
Temp_C	533
Dew Point Temp_C	489
Rel Hum_%	83
Wind Speed_km/h	34
Visibility_km	24
Press_kPa	518
Weather	50
dtype: int64	

In [27]: `data['Temp_C'].nunique()`

Out[27]: 533

.count

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

```
In [29]: data.count()
```

```
Out[29]: Date/Time      8784  
Temp_C        8784  
Dew Point Temp_C    8784  
Rel Hum_%       8784  
Wind Speed_km/h     8784  
Visibility_km       8784  
Press_kPa         8784  
Weather          8784  
dtype: int64
```

.value_counts

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

```
In [7]: import pandas as pd  
data=pd.read_csv(r"C:\Users\BHAVANI\Desktop\Weather Data.csv")  
data['Weather'].value_counts()
```

Out[7]:	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()

Provides basic information about the dataframe.

```
In [31]: data.info()
```

```
<class 'pandas.core.frame.DataFrame'>
RangeIndex: 8784 entries, 0 to 8783
Data columns (total 8 columns):
 #   Column            Non-Null Count  Dtype  
 ---  -- 
 0   Date/Time          8784 non-null   object 
 1   Temp_C              8784 non-null   float64
 2   Dew Point Temp_C   8784 non-null   float64
 3   Rel Hum_%          8784 non-null   int64  
 4   Wind Speed_km/h    8784 non-null   int64  
 5   Visibility_km       8784 non-null   float64
 6   Press_kPa           8784 non-null   float64
 7   Weather             8784 non-null   object 
dtypes: float64(4), int64(2), object(2)
memory usage: 549.1+ KB
```

Q1. Find all the unique "Wind Speed" values in the data

```
In [32]: data.head(2)
```

```
Out[32]:
```

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

```
In [33]: data.nunique()
```

```
Out[33]: Date/Time      8784
Temp_C        533
Dew Point Temp_C    489
Rel Hum_%       83
Wind Speed_km/h     34
Visibility_km      24
Press_kPa        518
Weather          50
dtype: int64
```

```
In [34]: data['Wind Speed_km/h'].nunique()
```

```
Out[34]: 34
```

```
In [35]: data['Wind Speed_km/h'].unique()
```

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

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

```
In [38]: data.head(2)
```

```
Out[38]:    Date/Time  Temp_C  Dew Point Temp_C  Rel Hum_%  Wind Speed_km/h  Visibility_km  Press_kPa  Weather
0  01-01-2012 00:00     -1.8           -3.9          86             4            8.0         101.24    Fog
1  01-01-2012 01:00     -1.8           -3.7          87             4            8.0         101.24    Fog
```

```
In [40]: data.Weather.value_counts()
```

Out[40]:	Mainly Clear	2106
	Mostly Cloudy	2069
	Cloudy	1728
	Clear	1326
	Snow	390
	Rain	306
	Rain Showers	188
	Fog	150
	Rain,Fog	116
	Drizzle,Fog	80
	Snow Showers	60
	Drizzle	41
	Snow,Fog	37
	Snow,Blowing Snow	19
	Rain,Snow	18
	Thunderstorms,Rain Showers	16
	Haze	16
	Drizzle,Snow,Fog	15
	Freezing Rain	14
	Freezing Drizzle,Snow	11
	Freezing Drizzle	7
	Snow,Ice Pellets	6
	Freezing Drizzle,Fog	6
	Snow,Haze	5
	Freezing Fog	4
	Snow Showers,Fog	4
	Moderate Snow	4
	Rain,Snow,Ice Pellets	4
	Freezing Rain,Fog	4
	Freezing Drizzle,Haze	3
	Rain,Haze	3
	Thunderstorms,Rain	3
	Thunderstorms,Rain Showers,Fog	3
	Freezing Rain,Haze	2
	Drizzle,Snow	2
	Rain Showers,Snow Showers	2
	Thunderstorms	2
	Moderate Snow,Blowing Snow	2
	Rain Showers,Fog	1
	Thunderstorms,Moderate Rain Showers,Fog	1
	Snow Pellets	1
	Rain,Snow,Fog	1
	Moderate Rain,Fog	1
	Freezing Rain,Ice Pellets,Fog	1
	Drizzle,Ice Pellets,Fog	1

```
Thunderstorms,Rain,Fog           1
Rain,Ice Pellets                1
Rain,Snow Grains                 1
Thunderstorms,Heavy Rain Showers 1
Freezing Rain,Snow Grains        1
Name: Weather, dtype: int64
```

In [50]: `data[data.Weather == 'Clear']`

Out[50]:

	Date/Time	Temp_C	Dew Point Temp_C	Rel Hum_%	Wind Speed_km/h	Visibility_km	Press_kPa	Weather
67	01-03-2012 19:00	-16.9	-24.8	50	24	25.0	101.74	Clear
114	01-05-2012 18:00	-7.1	-14.4	56	11	25.0	100.71	Clear
115	01-05-2012 19:00	-9.2	-15.4	61	7	25.0	100.80	Clear
116	01-05-2012 20:00	-9.8	-15.7	62	9	25.0	100.83	Clear
117	01-05-2012 21:00	-9.0	-14.8	63	13	25.0	100.83	Clear
...
8646	12/26/2012 6:00	-13.4	-14.8	89	4	25.0	102.47	Clear
8698	12/28/2012 10:00	-6.1	-8.6	82	19	24.1	101.27	Clear
8713	12/29/2012 1:00	-11.9	-13.6	87	11	25.0	101.31	Clear
8714	12/29/2012 2:00	-11.8	-13.1	90	13	25.0	101.33	Clear
8756	12/30/2012 20:00	-13.8	-16.5	80	24	25.0	101.52	Clear

1326 rows × 8 columns

In [51]: `data.groupby('Weather').get_group('Clear')`

Out[51]:

	Date/Time	Temp_C	Dew Point Temp_C	Rel Hum_%	Wind Speed_km/h	Visibility_km	Press_kPa	Weather
67	01-03-2012 19:00	-16.9	-24.8	50	24	25.0	101.74	Clear
114	01-05-2012 18:00	-7.1	-14.4	56	11	25.0	100.71	Clear
115	01-05-2012 19:00	-9.2	-15.4	61	7	25.0	100.80	Clear
116	01-05-2012 20:00	-9.8	-15.7	62	9	25.0	100.83	Clear
117	01-05-2012 21:00	-9.0	-14.8	63	13	25.0	100.83	Clear
...
8646	12/26/2012 6:00	-13.4	-14.8	89	4	25.0	102.47	Clear
8698	12/28/2012 10:00	-6.1	-8.6	82	19	24.1	101.27	Clear
8713	12/29/2012 1:00	-11.9	-13.6	87	11	25.0	101.31	Clear
8714	12/29/2012 2:00	-11.8	-13.1	90	13	25.0	101.33	Clear
8756	12/30/2012 20:00	-13.8	-16.5	80	24	25.0	101.52	Clear

1326 rows × 8 columns

Q) 3. Find the no.of times when the 'Wind Speed was exactly 4km/h'.

In [57]: `data[data['Wind Speed_km/h']==4]`

Out[57]:

	Date/Time	Temp_C	Dew Point Temp_C	Rel Hum_%	Wind Speed_km/h	Visibility_km	Press_kPa	Weather
0	01-01-2012 00:00	-1.8	-3.9	86	4	8.0	101.24	Fog
1	01-01-2012 01:00	-1.8	-3.7	87	4	8.0	101.24	Fog
96	01-05-2012 00:00	-8.8	-11.7	79	4	9.7	100.32	Snow
101	01-05-2012 05:00	-7.0	-9.5	82	4	4.0	100.19	Snow
146	01-07-2012 02:00	-8.1	-11.1	79	4	19.3	100.15	Cloudy
...
8768	12/31/2012 8:00	-8.6	-10.3	87	4	3.2	101.14	Snow Showers
8769	12/31/2012 9:00	-8.1	-9.6	89	4	2.4	101.09	Snow
8770	12/31/2012 10:00	-7.4	-8.9	89	4	6.4	101.05	Snow,Fog
8772	12/31/2012 12:00	-5.8	-7.5	88	4	12.9	100.78	Snow
8773	12/31/2012 13:00	-4.6	-6.6	86	4	12.9	100.63	Snow

474 rows × 8 columns

Q)4. Find out all the Null Values in the data

In [60]: `data.isnull().sum()`

```
Out[60]: Date/Time      0
Temp_C        0
Dew Point Temp_C  0
Rel Hum_%     0
Wind Speed_km/h 0
Visibility_km   0
Press_kPa      0
Weather         0
dtype: int64
```

In [61]: `data.notnull().sum()`

```
Out[61]: Date/Time      8784
Temp_C        8784
Dew Point Temp_C  8784
Rel Hum_%     8784
Wind Speed_km/h 8784
Visibility_km   8784
Press_kPa       8784
Weather         8784
dtype: int64
```

Q.5) Rename the column name 'Weather' of the dataframe to 'Weather Condition'.

```
In [6]: import pandas as pd
data=pd.read_csv(r"C:\Users\BHAVANI\Desktop\Weather Data.csv")
```

```
In [7]: data.head(2)
```

```
Out[7]:
```

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

```
In [12]: import pandas as pd
data=pd.read_csv(r"C:\Users\BHAVANI\Desktop\Weather Data.csv")
data.rename(columns = {'Weather':'Weather Conditions'})
```

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

```
In [5]: data.head(2)
```

```
Out[5]:
```

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

```
In [7]: data.Visibility_km.mean()
```

```
Out[7]: 27.66444672131151
```

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

```
In [8]: data.Press_kPa.std()
```

```
Out[8]: 0.8440047459486474
```

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

```
In [10]: data['Rel_Hum_%'].var()
```

```
Out[10]: 286.2485501984998
```

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

```
In [11]: data.head(2)
```

```
Out[11]:
```

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

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

Out[16]:	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 Conditions, dtype: int64
```

In [18]:

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

Out[18]:

	Date/Time	Temp_C	Dew Point	Temp_C	Rel Hum_%	Wind Speed_km/h	Visibility_km	Press_kPa	Weather Conditions
55	01-03-2012 07:00	-14.0		-19.5	63	19	25.0	100.95	Snow
84	01-04-2012 12:00	-13.7		-21.7	51	11	24.1	101.25	Snow
86	01-04-2012 14:00	-11.3		-19.0	53	7	19.3	100.97	Snow
87	01-04-2012 15:00	-10.2		-16.3	61	11	9.7	100.89	Snow
88	01-04-2012 16:00	-9.4		-15.5	61	13	19.3	100.79	Snow
...
8779	12/31/2012 19:00	0.1		-2.7	81	30	9.7	100.13	Snow
8780	12/31/2012 20:00	0.2		-2.4	83	24	9.7	100.03	Snow
8781	12/31/2012 21:00	-0.5		-1.5	93	28	4.8	99.95	Snow
8782	12/31/2012 22:00	-0.2		-1.8	89	28	9.7	99.91	Snow
8783	12/31/2012 23:00	0.0		-2.1	86	30	11.3	99.89	Snow

390 rows × 8 columns

In [21]:

```
data[data['Weather Conditions'].str.contains('Snow')].tail(50)
```

Out[21]:

	Date/Time	Temp_C	Dew Point Temp_C	Rel Hum_%	Wind Speed_km/h	Visibility_km	Press_kPa	Weather Conditions
8680	12/27/2012 16:00	-4.5	-6.2	88	37	2.0	100.44	Snow,Blowing Snow
8681	12/27/2012 17:00	-4.2	-5.9	88	32	3.2	100.47	Snow,Blowing Snow
8682	12/27/2012 18:00	-4.0	-5.7	88	28	8.0	100.49	Snow,Blowing Snow
8683	12/27/2012 19:00	-3.9	-5.6	88	26	9.7	100.52	Snow,Blowing Snow
8684	12/27/2012 20:00	-3.7	-5.3	89	37	16.1	100.58	Snow
8685	12/27/2012 21:00	-3.7	-4.8	92	24	4.8	100.62	Freezing Drizzle,Snow
8686	12/27/2012 22:00	-3.8	-4.6	94	20	4.8	100.65	Freezing Drizzle,Snow
8687	12/27/2012 23:00	-4.0	-5.6	89	24	9.7	100.70	Snow
8688	12/28/2012 0:00	-4.2	-5.7	89	19	8.0	100.78	Freezing Drizzle,Snow
8689	12/28/2012 1:00	-4.4	-6.6	85	15	6.4	100.83	Freezing Drizzle,Snow
8690	12/28/2012 2:00	-4.3	-6.3	86	11	12.9	100.93	Freezing Drizzle,Snow
8691	12/28/2012 3:00	-4.6	-5.9	91	13	4.0	101.01	Snow
8692	12/28/2012 4:00	-4.9	-5.9	93	9	9.7	101.00	Snow
8723	12/29/2012 11:00	-10.9	-12.2	90	7	6.4	101.09	Snow Showers,Fog
8724	12/29/2012 12:00	-10.5	-11.6	92	11	8.0	100.93	Snow Showers,Fog
8725	12/29/2012 13:00	-10.0	-11.1	92	22	9.7	100.63	Snow Showers,Fog
8726	12/29/2012 14:00	-9.3	-10.5	91	22	4.8	100.60	Snow,Fog
8727	12/29/2012 15:00	-8.8	-10.0	91	20	1.2	100.55	Snow,Fog
8728	12/29/2012 16:00	-8.5	-9.9	90	24	1.2	100.49	Snow,Fog
8729	12/29/2012 17:00	-9.0	-10.4	90	19	2.4	100.46	Snow,Fog
8730	12/29/2012 18:00	-9.3	-10.9	88	26	6.4	100.38	Snow,Fog
8731	12/29/2012 19:00	-9.5	-11.2	87	26	3.2	100.33	Snow,Fog
8732	12/29/2012 20:00	-9.7	-11.6	86	24	9.7	100.25	Snow,Fog
8733	12/29/2012 21:00	-9.8	-11.8	85	24	8.0	100.24	Snow,Fog
8734	12/29/2012 22:00	-10.1	-11.6	89	15	2.4	100.20	Snow,Fog

	Date/Time	Temp_C	Dew Point Temp_C	Rel Hum_%	Wind Speed_km/h	Visibility_km	Press_kPa	Weather Conditions
8735	12/29/2012 23:00	-10.0	-12.0	85	20	6.4	100.19	Snow,Fog
8736	12/30/2012 0:00	-9.6	-11.3	87	13	3.2	100.23	Snow,Fog
8737	12/30/2012 1:00	-9.4	-10.5	92	9	2.4	100.22	Snow,Fog
8738	12/30/2012 2:00	-9.3	-10.4	92	9	4.0	100.28	Snow,Fog
8739	12/30/2012 3:00	-9.1	-10.4	90	11	3.6	100.30	Snow,Fog
8740	12/30/2012 4:00	-9.3	-10.6	90	13	9.7	100.28	Snow,Fog
8741	12/30/2012 5:00	-9.1	-10.4	90	11	4.0	100.32	Snow,Fog
8742	12/30/2012 6:00	-9.3	-10.8	89	17	8.0	100.39	Snow,Fog
8767	12/31/2012 7:00	-9.3	-11.3	85	0	19.3	101.19	Snow Showers
8768	12/31/2012 8:00	-8.6	-10.3	87	4	3.2	101.14	Snow Showers
8769	12/31/2012 9:00	-8.1	-9.6	89	4	2.4	101.09	Snow
8770	12/31/2012 10:00	-7.4	-8.9	89	4	6.4	101.05	Snow,Fog
8771	12/31/2012 11:00	-6.7	-7.9	91	9	9.7	100.93	Snow
8772	12/31/2012 12:00	-5.8	-7.5	88	4	12.9	100.78	Snow
8773	12/31/2012 13:00	-4.6	-6.6	86	4	12.9	100.63	Snow
8774	12/31/2012 14:00	-3.4	-5.7	84	6	11.3	100.57	Snow
8775	12/31/2012 15:00	-2.3	-4.6	84	9	9.7	100.47	Snow
8776	12/31/2012 16:00	-1.4	-4.0	82	13	12.9	100.40	Snow
8777	12/31/2012 17:00	-1.1	-3.3	85	19	9.7	100.30	Snow
8778	12/31/2012 18:00	-1.3	-3.1	88	17	9.7	100.19	Snow
8779	12/31/2012 19:00	0.1	-2.7	81	30	9.7	100.13	Snow
8780	12/31/2012 20:00	0.2	-2.4	83	24	9.7	100.03	Snow
8781	12/31/2012 21:00	-0.5	-1.5	93	28	4.8	99.95	Snow
8782	12/31/2012 22:00	-0.2	-1.8	89	28	9.7	99.91	Snow
8783	12/31/2012 23:00	0.0	-2.1	86	30	11.3	99.89	Snow

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

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

Out[24]:

	Date/Time	Temp_C	Dew Point Temp_C	Rel Hum_%	Wind Speed_km/h	Visibility_km	Press_kPa	Weather Conditions
23	01-01-2012 23:00	5.3	2.0	79	30	25.0	99.31	Cloudy
24	01-02-2012 00:00	5.2	1.5	77	35	25.0	99.26	Rain Showers
25	01-02-2012 01:00	4.6	0.0	72	39	25.0	99.26	Cloudy
26	01-02-2012 02:00	3.9	-0.9	71	32	25.0	99.26	Mostly Cloudy
27	01-02-2012 03:00	3.7	-1.5	69	33	25.0	99.30	Mostly Cloudy
...
8705	12/28/2012 17:00	-8.6	-12.0	76	26	25.0	101.34	Mainly Clear
8753	12/30/2012 17:00	-12.1	-15.8	74	28	25.0	101.26	Mainly Clear
8755	12/30/2012 19:00	-13.4	-16.5	77	26	25.0	101.47	Mainly Clear
8759	12/30/2012 23:00	-12.1	-15.1	78	28	25.0	101.52	Mostly Cloudy
8760	12/31/2012 0:00	-11.1	-14.4	77	26	25.0	101.51	Cloudy

308 rows × 8 columns

Q.11) What is the Mean value of each column against each 'Weather Condition'?

In [25]: `data.groupby('Weather Conditions').mean()`

Out[25]:

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

Weather Conditions		Temp_C	Dew Point Temp_C	Rel Hum_%	Wind Speed_km/h	Visibility_km	Press_kPa
Rain	9.786275	7.042810	83.624183	19.254902	18.856536	100.233333	
Rain Showers	13.722340	9.187766	75.159574	17.132979	22.816489	100.404043	
Rain Showers,Fog	12.800000	12.100000	96.000000	13.000000	6.400000	99.830000	
Rain Showers,Snow Showers	2.150000	-1.500000	76.500000	22.500000	21.700000	101.100000	
Rain,Fog	8.273276	7.219828	93.189655	14.793103	6.873276	100.500862	
Rain,Haze	4.633333	2.066667	83.333333	11.666667	6.700000	100.540000	
Rain,Ice Pellets	0.600000	-0.600000	92.000000	24.000000	9.700000	100.120000	
Rain,Snow	1.055556	-0.566667	89.000000	28.388889	11.672222	99.951111	
Rain,Snow Grains	1.900000	-2.100000	75.000000	26.000000	25.000000	100.600000	
Rain,Snow,Fog	0.800000	0.300000	96.000000	9.000000	6.400000	100.730000	
Rain,Snow,Ice Pellets	1.100000	-0.175000	91.500000	23.250000	6.000000	100.105000	
Snow	-4.524103	-7.623333	79.307692	20.038462	11.171795	100.536103	
Snow Pellets	0.700000	-6.400000	59.000000	35.000000	2.400000	99.700000	
Snow Showers	-3.506667	-7.866667	72.350000	19.233333	20.158333	100.963500	
Snow Showers,Fog	-10.675000	-11.900000	90.750000	13.750000	7.025000	101.292500	
Snow,Blowing Snow	-5.410526	-7.621053	84.473684	34.842105	4.105263	99.704737	
Snow,Fog	-5.075676	-6.364865	90.675676	17.324324	4.537838	100.688649	
Snow,Haze	-4.020000	-6.860000	80.600000	5.000000	4.640000	100.782000	
Snow,Ice Pellets	-1.883333	-3.666667	87.666667	23.833333	7.416667	100.548333	
Thunderstorms	24.150000	19.750000	77.000000	7.500000	24.550000	100.230000	
Thunderstorms,Heavy Rain Showers	10.900000	9.000000	88.000000	9.000000	2.400000	100.260000	
Thunderstorms,Moderate Rain Showers,Fog	19.600000	18.500000	93.000000	15.000000	3.200000	100.010000	
Thunderstorms,Rain	20.433333	18.533333	89.000000	15.666667	19.833333	100.420000	
Thunderstorms,Rain Showers	20.037500	17.618750	86.375000	18.312500	15.893750	100.233750	

	Temp_C	Dew Point Temp_C	Rel Hum_%	Wind Speed_km/h	Visibility_km	Press_kPa
Weather Conditions						
Thunderstorms,Rain Showers,Fog	21.600000	18.700000	84.000000	19.666667	9.700000	100.063333
Thunderstorms,Rain,Fog	20.600000	18.600000	88.000000	19.000000	4.800000	100.080000

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

In [28]: `data.groupby('Weather Conditions').min()`

Out[28]:

	Date/Time	Temp_C	Dew Point Temp_C	Rel Hum_%	Wind Speed_km/h	Visibility_km	Press_kPa	
Weather Conditions								
	Clear	01-03-2012 19:00	-23.3	-28.5	20	0	11.3	99.52
	Cloudy	01-01-2012 17:00	-21.4	-26.8	18	0	11.3	98.39
	Drizzle	05-01-2012 15:00	1.1	-0.2	74	0	6.4	97.84
	Drizzle,Fog	05-01-2012 16:00	0.0	-1.6	85	0	1.0	98.65
	Drizzle,Ice Pellets,Fog	12/17/2012 9:00	0.4	-0.7	92	20	4.0	100.79
	Drizzle,Snow	12/17/2012 15:00	0.9	0.1	92	9	9.7	100.63
	Drizzle,Snow,Fog	12/18/2012 21:00	0.3	-0.1	92	7	2.4	97.79
	Fog	01-01-2012 00:00	-16.0	-17.2	80	0	0.2	98.31
	Freezing Drizzle	01-07-2012 11:00	-9.0	-12.2	78	6	4.8	98.44
	Freezing Drizzle,Fog	01-01-2012 02:00	-6.4	-9.0	82	6	3.6	98.74
	Freezing Drizzle,Haze	02-01-2012 11:00	-5.8	-8.3	81	9	2.0	100.28
	Freezing Drizzle,Snow	03-02-2012 12:00	-8.3	-10.4	79	6	2.4	99.19
	Freezing Fog	02-05-2012 10:00	-19.0	-22.9	71	0	0.2	101.97
	Freezing Rain	01-07-2012 10:00	-6.5	-9.0	81	7	2.8	98.22
	Freezing Rain,Fog	01-07-2012 09:00	-6.1	-8.7	82	7	2.8	98.32

	Date/Time	Temp_C	Dew Point Temp_C	Rel Hum_%	Wind Speed_km/h	Visibility_km	Press_kPa
Weather Conditions							
Freezing Rain,Haze	02-01-2012 14:00	-4.9	-7.5	82	6	2.0	100.34
Freezing Rain,Ice Pellets,Fog	12/17/2012 3:00	-2.6	-3.7	92	28	8.0	100.95
Freezing Rain,Snow Grains	1/13/2012 9:00	-5.0	-7.3	84	32	4.8	98.56
Haze	02-01-2012 10:00	-11.5	-16.0	68	0	4.8	100.35
Mainly Clear	01-02-2012 12:00	-22.8	-28.0	20	0	12.9	98.67
Moderate Rain,Fog	12-10-2012 08:00	1.7	0.8	94	17	6.4	99.98
Moderate Snow	01-12-2012 15:00	-6.3	-7.6	83	26	0.6	99.88
Moderate Snow,Blowing Snow	12/27/2012 10:00	-5.5	-6.6	92	39	0.6	100.50
Mostly Cloudy	01-01-2012 16:00	-23.2	-28.5	18	0	11.3	98.36
Rain	01-01-2012 18:00	0.3	-5.7	40	0	4.0	97.52
Rain Showers	01-01-2012 22:00	1.6	-7.2	37	0	6.4	98.51
Rain Showers,Fog	10/20/2012 3:00	12.8	12.1	96	13	6.4	99.83
Rain Showers,Snow Showers	11-04-2012 08:00	2.1	-1.8	75	17	19.3	101.09
Rain,Fog	03-08-2012 22:00	0.0	-1.2	83	0	2.0	98.61
Rain,Haze	3/13/2012 7:00	4.0	1.0	81	7	4.0	100.50
Rain,Ice Pellets	12/18/2012 5:00	0.6	-0.6	92	24	9.7	100.12
Rain,Snow	01-10-2012	0.6	-1.7	81	13	2.4	98.18

	Date/Time	Temp_C	Dew Point Temp_C	Rel Hum_%	Wind Speed_km/h	Visibility_km	Press_kPa
Weather Conditions							
	05:00						
Rain,Snow Grains	12/21/2012 0:00	1.9	-2.1	75	26	25.0	100.60
Rain,Snow,Fog	12-08-2012 21:00	0.8	0.3	96	9	6.4	100.73
Rain,Snow,Ice Pellets	12/21/2012 1:00	0.9	-0.7	88	17	4.8	99.85
Snow	01-03-2012 07:00	-16.7	-24.6	41	0	1.0	97.75
Snow Pellets	11/24/2012 15:00	0.7	-6.4	59	35	2.4	99.70
Snow Showers	01-02-2012 17:00	-13.3	-19.3	52	0	2.4	99.49
Snow Showers,Fog	12/26/2012 9:00	-11.3	-12.7	89	7	4.0	100.63
Snow,Blowing Snow	1/13/2012 21:00	-12.0	-16.2	70	24	0.6	98.11
Snow,Fog	02-10-2012 23:00	-10.1	-12.0	77	4	1.2	99.38
Snow,Haze	02-01-2012 17:00	-4.3	-7.2	80	0	4.0	100.61
Snow,Ice Pellets	03-03-2012 04:00	-4.3	-5.9	76	19	2.8	99.40
Thunderstorms	07-04-2012 16:00	21.6	19.4	67	0	24.1	99.84
Thunderstorms,Heavy Rain Showers	5/29/2012 6:00	10.9	9.0	88	9	2.4	100.26
Thunderstorms,Moderate Rain Showers,Fog	7/17/2012 6:00	19.6	18.5	93	15	3.2	100.01
Thunderstorms,Rain	5/25/2012 20:00	19.4	18.2	83	4	16.1	100.19
Thunderstorms,Rain Showers	07-04-2012 17:00	11.0	7.0	68	7	6.4	99.65
Thunderstorms,Rain Showers,Fog	6/29/2012 3:00	19.5	16.1	80	7	9.7	99.71

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

Thunderstorms,Rain,Fog	7/17/2012 5:00	20.6	18.6	88	19	4.8	100.08
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In [29]: `data.groupby('Weather Conditions').max()`

Out[29]:

	Date/Time	Temp_C	Dew Point Temp_C	Rel Hum_%	Wind Speed_km/h	Visibility_km	Press_kPa	
Weather Conditions								
	Clear	9/28/2012 4:00	32.8	20.4	99	33	48.3	103.63
	Cloudy	9/30/2012 9:00	30.5	22.6	99	54	48.3	103.65
	Drizzle	9/30/2012 3:00	18.8	17.7	96	30	25.0	101.56
	Drizzle,Fog	9/30/2012 2:00	19.9	19.1	100	28	9.7	102.07
	Drizzle,Ice Pellets,Fog	12/17/2012 9:00	0.4	-0.7	92	20	4.0	100.79
	Drizzle,Snow	12/19/2012 18:00	1.2	0.2	95	19	11.3	101.15
	Drizzle,Snow,Fog	12/22/2012 3:00	1.1	0.6	98	32	9.7	100.15
	Fog	9/22/2012 0:00	20.8	19.6	100	22	9.7	103.04
	Freezing Drizzle	12/17/2012 0:00	-2.3	-3.3	93	26	12.9	101.02
	Freezing Drizzle,Fog	12-10-2012 05:00	-0.3	-2.3	94	33	8.0	101.27
	Freezing Drizzle,Haze	02-01-2012 13:00	-5.0	-7.7	83	11	4.0	100.36
	Freezing Drizzle,Snow	12/28/2012 2:00	-3.3	-4.6	94	24	12.9	101.18
	Freezing Fog	3/17/2012 6:00	-0.1	-0.3	99	9	0.8	102.85
	Freezing Rain	12/17/2012 2:00	0.3	-1.7	92	28	16.1	101.00
	Freezing Rain,Fog	12/17/2012 1:00	0.1	-0.9	93	26	9.7	101.01
	Freezing Rain,Haze	02-01-2012 15:00	-4.9	-7.4	83	9	2.8	100.41
	Freezing Rain,Ice Pellets,Fog	12/17/2012 3:00	-2.6	-3.7	92	28	8.0	100.95
	Freezing Rain,Snow Grains	1/13/2012 9:00	-5.0	-7.3	84	32	4.8	98.56
	Haze	3/13/2012 23:00	14.1	11.1	86	17	9.7	102.97
	Mainly Clear	9/28/2012 8:00	33.0	21.2	99	63	48.3	103.59
	Moderate Rain,Fog	12-10-2012	1.7	0.8	94	17	6.4	99.98

	Date/Time	Temp_C	Dew Point Temp_C	Rel Hum %	Wind Speed_km/h	Visibility_km	Press_kPa
Weather Conditions							
	08:00						
Moderate Snow	12/27/2012 9:00	-4.9	-6.7	93	39	0.8	100.67
Moderate Snow,Blowing Snow	12/27/2012 12:00	-5.4	-6.4	93	41	0.6	100.64
Mostly Cloudy	9/29/2012 9:00	32.4	24.4	100	83	48.3	103.65
Rain	9/30/2012 22:00	22.8	20.4	99	52	48.3	102.26
Rain Showers	9/26/2012 16:00	26.4	23.0	97	41	48.3	102.31
Rain Showers,Fog	10/20/2012 3:00	12.8	12.1	96	13	6.4	99.83
Rain Showers,Snow Showers	12-05-2012 10:00	2.2	-1.2	78	28	24.1	101.11
Rain,Fog	9/30/2012 23:00	21.7	19.5	100	46	9.7	101.77
Rain,Haze	3/13/2012 9:00	5.5	2.9	86	17	9.7	100.61
Rain,Ice Pellets	12/18/2012 5:00	0.6	-0.6	92	24	9.7	100.12
Rain,Snow	4/23/2012 3:00	1.7	0.5	94	52	25.0	101.07
Rain,Snow Grains	12/21/2012 0:00	1.9	-2.1	75	26	25.0	100.60
Rain,Snow,Fog	12-08-2012 21:00	0.8	0.3	96	9	6.4	100.73
Rain,Snow,Ice Pellets	12/21/2012 5:00	1.3	0.1	94	28	6.4	100.47
Snow	4/27/2012 9:00	3.7	0.3	96	57	25.0	102.73
Snow Pellets	11/24/2012 15:00	0.7	-6.4	59	35	2.4	99.70
Snow Showers	2/23/2012 13:00	2.9	-0.7	94	37	48.3	102.50
Snow Showers,Fog	12/29/2012 13:00	-10.0	-11.1	92	22	9.7	102.52
Snow,Blowing Snow	2/25/2012 9:00	-1.4	-2.9	91	48	9.7	100.62
Snow,Fog	3/14/2012 19:00	1.1	0.8	99	35	9.7	102.07

		Date/Time	Temp_C	Dew Point Temp_C	Rel Hum_%	Wind Speed_km/h	Visibility_km	Press_kPa
Weather Conditions								
	Snow,Haze	02-01-2012 21:00	-3.6	-6.4	81	15	6.4	100.99
	Snow,Ice Pellets	3/28/2012 8:00	0.8	-1.7	92	33	11.3	100.96
	Thunderstorms	7/16/2012 1:00	26.7	20.1	87	15	25.0	100.62
	Thunderstorms,Heavy Rain Showers	5/29/2012 6:00	10.9	9.0	88	9	2.4	100.26
	Thunderstorms,Moderate Rain Showers,Fog	7/17/2012 6:00	19.6	18.5	93	15	3.2	100.01
	Thunderstorms,Rain	7/23/2012 18:00	21.3	19.1	93	30	24.1	100.83
	Thunderstorms,Rain Showers	9/14/2012 20:00	25.5	23.1	98	32	25.0	101.06
	Thunderstorms,Rain Showers,Fog	7/31/2012 20:00	22.9	21.3	91	35	9.7	100.64
	Thunderstorms,Rain,Fog	7/17/2012 5:00	20.6	18.6	88	19	4.8	100.08

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

In [30]: `data[data['Weather Conditions']=='Fog']`

Out[30]:

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

150 rows × 8 columns

Q.14) Find all instances when 'Weather is Clear' or 'Visibility is above 40'.

In [33]: `data[(data['Weather Conditions']=='Clear') |(data['Visibility_km']>40)]`

Out[33]:

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

3027 rows × 8 columns

Q.15) Find all instances when:

A.'Weather is Clear' and 'Relative humidity is greater than 50' or B. 'Visibility is above 40'

```
In [34]: data[(data['Weather Conditions']=='Clear') & (data['Rel Hum %']>50) | (data['Visibility_km']>40)]
```

Out[34]:

	Date/Time	Temp_C	Dew Point Temp_C	Rel Hum_%	Wind Speed_km/h	Visibility_km	Press_kPa	Weather Conditions
106	01-05-2012 10:00	-6.0	-10.0	73	17	48.3	100.45	Mainly Clear
107	01-05-2012 11:00	-5.6	-10.2	70	22	48.3	100.41	Mainly Clear
108	01-05-2012 12:00	-4.7	-9.6	69	20	48.3	100.38	Mainly Clear
109	01-05-2012 13:00	-4.4	-9.7	66	26	48.3	100.40	Mainly Clear
110	01-05-2012 14:00	-5.1	-10.7	65	22	48.3	100.46	Mainly Clear
...
8749	12/30/2012 13:00	-12.4	-16.2	73	37	48.3	100.92	Mostly Cloudy
8750	12/30/2012 14:00	-11.8	-16.1	70	37	48.3	100.96	Mainly Clear
8751	12/30/2012 15:00	-11.3	-15.6	70	32	48.3	101.05	Mainly Clear
8752	12/30/2012 16:00	-11.4	-15.5	72	26	48.3	101.15	Mainly Clear
8756	12/30/2012 20:00	-13.8	-16.5	80	24	25.0	101.52	Clear

2921 rows × 8 columns

In []: