

The Weather Dataset

Here, The Weather Dataset is a time-series data set with per-hour information about the weather conditions at a particular location. It records temperature, Dew Point Temperature, Relative Humidity, Wind Speed, Visibility, Pressure, and Conditions.

This data is available as a CSV file. We are going to analyze this data set using the Pandas DataFrame

Questions are given in the project and then solved with the help of Python.

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

Q2. Find the number of times when the 'Weather is exactly Clear'.

Q3. Find the number of times when the 'Wind Speed was exactly 4 km/h'.

Q4. Find out all the Null Values in the data.

Q5.Rename the column name 'Weather' of the dataframe to 'Weather Condition'.

Q6.What is the mean 'Visibility' ?

Q7.What is the Standard Deviation of 'Pressure' in this data?

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

Q9. Find all instances when 'Snow' was recorded.

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

Q11.What is the Mean value of each column against each 'Weather Condition ?

Q12.What is the Minimum & Maximum value of each column against each 'Weather Condition ?

Q13.Show all the Records where Weather Condition is Fog.

Q14.Find all instances when 'Weather is Clear' or 'Visibility is above 40'.

Q15.Find all instances when :

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

```
In [66]: import pandas as pd
```

```
In [4]: data=pd.read_csv(r"C:\Users\Arjun\OneDrive\Documents\DA\1. Weather Data.csv")
```

```
In [5]: data #answer
```

Out[5]:

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

8784 rows × 8 columns

How to analyse DataFrame a) .head() It shows the first N rows in the data(by default,N=5)

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

Out[6]:

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

b) .shape It shows the total no.of rows and no.of columns of the DataFrame

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

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

c) .index This attribute provides the index of the DataFrame

In [8]: data.index #answer

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

d) .columns This shows the name of each column

In [9]: data.columns #answer

Out[9]: Index(['Date/Time', 'Temp_C', 'Dew Point Temp_C', 'Rel Hum_%', 'Wind Speed_km/h', 'Visibility_km', 'Press_kPa', 'Weather'], dtype='object')

e) .dtypes It shows the data type of each column

In [10]: data.dtypes #answer

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

f) .unique() In a column, it shows all the unique values. It can only apply on a single column only.

In [11]: data["Weather"].unique() #answer

Out[11]: array(['Fog', 'Freezing Drizzle,Fog', 'Mostly Cloudy', 'Cloudy', 'Rain', 'Rain Showers', 'Mainly Clear', 'Snow Showers', 'Snow', 'Clear', 'Freezing Rain,Fog', 'Freezing Rain', 'Freezing Drizzle', 'Rain,Snow', 'Moderate Snow', 'Freezing Drizzle,Snow', 'Freezing Rain,Snow Grains', 'Snow,Blowing Snow', 'Freezing Fog', 'Haze', 'Rain,Fog', 'Drizzle,Fog', 'Drizzle', 'Freezing Drizzle,Haze', 'Freezing Rain,Haze', 'Snow,Haze', 'Snow,Fog', 'Snow,Ice Pellets', 'Rain,Haze', 'Thunderstorms,Rain', 'Thunderstorms,Rain Showers', 'Thunderstorms,Heavy Rain Showers', 'Thunderstorms,Rain Showers,Fog', 'Thunderstorms', 'Thunderstorms,Rain,Fog', 'Thunderstorms,Moderate Rain Showers,Fog', 'Rain Showers,Fog', 'Rain Showers,Snow Showers', 'Snow Pellets', 'Rain,Snow,Fog', 'Moderate Rain,Fog', 'Freezing Rain,Ice Pellets,Fog', 'Drizzle,Ice Pellets,Fog', 'Drizzle,Snow', 'Rain,Ice Pellets', 'Drizzle,Snow,Fog', 'Rain,Snow Grains', 'Rain,Snow,Ice Pellets', 'Snow Showers,Fog', 'Moderate Snow,Blowing Snow'], dtype=object)

g) .nunique() It shows the total number of unique values in each column. It can be applicable for both single column and whole DataFrame

In [12]: data.nunique() #answer

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

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

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

```
Out[13]: Date/Time      8784  
Temp_C        8784  
Dew Point Temp_C    8784  
Rel Hum_%      8784  
Wind Speed_km/h    8784  
Visibility_km      8784  
Press_kPa        8784  
Weather          8784  
dtype: int64
```

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

```
In [15]: data['Weather'].value_counts() #answer
```

Out[15]:	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	

j) .info() Provides basic information about DataFrame

```
In [16]: data.info() #answer
```

```
<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.Answer

In [17]: `data.head(2)`

Out[17]:

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

In [18]: `data.nunique()`

Out[18]:

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

Out[19]: 34

In [21]: `data["Wind Speed_km/h"].unique() #answer`

Out[21]:

```
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.Answer

In [22]: `data.head()`

Out[22]:

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

In [23]: `data.Weather.value_counts()` #counting values

```
Out[23]: 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 [24]: data[data.Weather=="Clear"] #Filtering
```

Out[24]:

	Date/Time	Temp_C	Dew Point Temp_C	Rel Hum_%	Wind Speed_km/h	Visibility_km	Press_kPa	Weather
67	1/3/2012 19:00	-16.9	-24.8	50	24	25.0	101.74	Clear
114	1/5/2012 18:00	-7.1	-14.4	56	11	25.0	100.71	Clear
115	1/5/2012 19:00	-9.2	-15.4	61	7	25.0	100.80	Clear
116	1/5/2012 20:00	-9.8	-15.7	62	9	25.0	100.83	Clear
117	1/5/2012 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 [25]: `data.groupby('Weather').get_group("Clear") #answer`

Out[25]:

	Date/Time	Temp_C	Dew Point Temp_C	Rel Hum_%	Wind Speed_km/h	Visibility_km	Press_kPa	Weather
67	1/3/2012 19:00	-16.9	-24.8	50	24	25.0	101.74	Clear
114	1/5/2012 18:00	-7.1	-14.4	56	11	25.0	100.71	Clear
115	1/5/2012 19:00	-9.2	-15.4	61	7	25.0	100.80	Clear
116	1/5/2012 20:00	-9.8	-15.7	62	9	25.0	100.83	Clear
117	1/5/2012 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

Q3.Answer

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

Out[26]:

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

In [28]: `data[data['Wind Speed_km/h'] == 4] #answer`

Out[28]:

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

474 rows × 8 columns

Q4.Answer

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

Out[29]:

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

In [30]: `data.isnull()`

Out[30]:

	Date/Time	Temp_C	Dew Point Temp_C	Rel Hum_%	Wind Speed_km/h	Visibility_km	Press_kPa	Weather
0	False	False	False	False	False	False	False	False
1	False	False	False	False	False	False	False	False
2	False	False	False	False	False	False	False	False
3	False	False	False	False	False	False	False	False
4	False	False	False	False	False	False	False	False
...
8779	False	False	False	False	False	False	False	False
8780	False	False	False	False	False	False	False	False
8781	False	False	False	False	False	False	False	False
8782	False	False	False	False	False	False	False	False
8783	False	False	False	False	False	False	False	False

8784 rows × 8 columns

In [31]: `data.isnull().sum() #answer`

```
Out[31]: Date/Time      0
Temp_C        0
Dew Point Temp_C  0
Rel Hum_%     0
Wind Speed_km/h 0
Visibility_km   0
Press_kPa      0
Weather         0
dtype: int64
```

Q5.Answer

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

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

In [33]: `data.rename(columns={'Weather': 'Weather Condition'}) #temporarily replace`

Out[33]:

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

8784 rows × 8 columns

In [35]: `data.rename(columns={'Weather': 'Weather Condition'}) inplace=True) #answer`

In [36]: `data.head() #answer`

Out[36]:

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

Q6.Answer

In [37]: `data.head()`

Out[37]:

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

In [38]: `data.Visibility_km.mean() #answer`

Out[38]: 27.66444672131151

Q7.Answer

In [39]: `data.head()`

Out[39]:

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

In [40]: `data.Press_kPa.std() #answer`

Out[40]: 0.8440047459486474

Q8.Answer

In [41]: `data.head()`

Out[41]:

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

In [43]: `data['Rel_Hum_%'].var() #answer`

Out[43]: 286.2485501984998

Q9.Answer

In [44]: `data.head()`

Out[44]:

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

In [45]: `data['Weather Condition'].value_counts()`

Out[45]:	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 Condition, dtype: int64	

In [46]: `data[data['Weather Condition']=='Snow']`

Out[46]:

	Date/Time	Temp_C	Dew Point Temp_C	Rel Hum_%	Wind Speed_km/h	Visibility_km	Press_kPa	Weather Condition
55	1/3/2012 7:00	-14.0	-19.5	63	19	25.0	100.95	Snow
84	1/4/2012 12:00	-13.7	-21.7	51	11	24.1	101.25	Snow
86	1/4/2012 14:00	-11.3	-19.0	53	7	19.3	100.97	Snow
87	1/4/2012 15:00	-10.2	-16.3	61	11	9.7	100.89	Snow
88	1/4/2012 16:00	-9.4	-15.5	61	13	19.3	100.79	Snow
...
8779	12/31/2012 19:00	0.1	-2.7	81	30	9.7	100.13	Snow
8780	12/31/2012 20:00	0.2	-2.4	83	24	9.7	100.03	Snow
8781	12/31/2012 21:00	-0.5	-1.5	93	28	4.8	99.95	Snow
8782	12/31/2012 22:00	-0.2	-1.8	89	28	9.7	99.91	Snow
8783	12/31/2012 23:00	0.0	-2.1	86	30	11.3	99.89	Snow

390 rows × 8 columns

In [47]: `data[data['Weather Condition'].str.contains('Snow')]` #answer

Out[47]:

	Date/Time	Temp_C	Dew Point Temp_C	Rel Hum_%	Wind Speed_km/h	Visibility_km	Press_kPa	Weather Condition
41	1/2/2012 17:00	-2.1	-9.5	57	22	25.0	99.66	Snow Showers
44	1/2/2012 20:00	-5.6	-13.4	54	24	25.0	100.07	Snow Showers
45	1/2/2012 21:00	-5.8	-12.8	58	26	25.0	100.15	Snow Showers
47	1/2/2012 23:00	-7.4	-14.1	59	17	19.3	100.27	Snow Showers
48	1/3/2012 0:00	-9.0	-16.0	57	28	25.0	100.35	Snow Showers
...
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

583 rows × 8 columns



Q10.Answer

In [48]: `data.head()`

Out[48]:

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

In [49]: `data[(data['Wind Speed_km/h'] > 24) & (data['Visibility_km'] == 25)] #answer`

Out[49]:

	Date/Time	Temp_C	Dew Point Temp_C	Rel Hum_%	Wind Speed_km/h	Visibility_km	Press_kPa	Weather Condition
23	1/1/2012 23:00	5.3	2.0	79	30	25.0	99.31	Cloudy
24	1/2/2012 0:00	5.2	1.5	77	35	25.0	99.26	Rain Showers
25	1/2/2012 1:00	4.6	0.0	72	39	25.0	99.26	Cloudy
26	1/2/2012 2:00	3.9	-0.9	71	32	25.0	99.26	Mostly Cloudy
27	1/2/2012 3:00	3.7	-1.5	69	33	25.0	99.30	Mostly Cloudy
...
8705	12/28/2012 17:00	-8.6	-12.0	76	26	25.0	101.34	Mainly Clear
8753	12/30/2012 17:00	-12.1	-15.8	74	28	25.0	101.26	Mainly Clear
8755	12/30/2012 19:00	-13.4	-16.5	77	26	25.0	101.47	Mainly Clear
8759	12/30/2012 23:00	-12.1	-15.1	78	28	25.0	101.52	Mostly Cloudy
8760	12/31/2012 0:00	-11.1	-14.4	77	26	25.0	101.51	Cloudy

308 rows × 8 columns



Q11.Answer

In [50]: `data.head()`

Out[50]:

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

In [51]: `data.groupby('Weather Condition').mean() #answer`

Out[51]:

	Temp_C	Dew Point Temp_C	Rel Hum_%	Wind Speed_km/h	Visibility_km	Press_kPa
Weather Condition						
Clear	6.825716	0.089367	64.497738	10.557315	30.153243	101.587443
Cloudy	7.970544	2.375810	69.592593	16.127315	26.625752	100.911441
Drizzle	7.353659	5.504878	88.243902	16.097561	17.931707	100.435366
Drizzle,Fog	8.067500	7.033750	93.275000	11.862500	5.257500	100.786625
Drizzle,Ice Pellets,Fog	0.400000	-0.700000	92.000000	20.000000	4.000000	100.790000
Drizzle,Snow	1.050000	0.150000	93.500000	14.000000	10.500000	100.890000
Drizzle,Snow,Fog	0.693333	0.120000	95.866667	15.533333	5.513333	99.281333
Fog	4.303333	3.159333	92.286667	7.946667	6.248000	101.184067
Freezing Drizzle	-5.657143	-8.000000	83.571429	16.571429	9.200000	100.202857
Freezing Drizzle,Fog	-2.533333	-4.183333	88.500000	17.000000	5.266667	100.441667
Freezing Drizzle,Haze	-5.433333	-8.000000	82.000000	10.333333	2.666667	100.316667
Freezing Drizzle,Snow	-5.109091	-7.072727	86.090909	16.272727	5.872727	100.520909
Freezing Fog	-7.575000	-9.250000	87.750000	4.750000	0.650000	102.320000
Freezing Rain	-3.885714	-6.078571	84.642857	19.214286	8.242857	99.647143
Freezing Rain,Fog	-2.225000	-3.750000	89.500000	15.500000	7.550000	99.945000
Freezing Rain,Haze	-4.900000	-7.450000	82.500000	7.500000	2.400000	100.375000
Freezing Rain,Ice Pellets,Fog	-2.600000	-3.700000	92.000000	28.000000	8.000000	100.950000
Freezing Rain,Snow Grains	-5.000000	-7.300000	84.000000	32.000000	4.800000	98.560000
Haze	-0.200000	-2.975000	81.625000	10.437500	7.831250	101.482500
Mainly Clear	12.558927	4.581671	60.667142	14.144824	34.264862	101.248832
Moderate Rain,Fog	1.700000	0.800000	94.000000	17.000000	6.400000	99.980000
Moderate Snow	-5.525000	-7.250000	87.750000	33.750000	0.750000	100.275000
Moderate Snow,Blowing Snow	-5.450000	-6.500000	92.500000	40.000000	0.600000	100.570000
Mostly Cloudy	10.574287	3.131174	62.102465	15.813920	31.253842	101.025288
Rain	9.786275	7.042810	83.624183	19.254902	18.856536	100.233333
Rain Showers	13.722340	9.187766	75.159574	17.132979	22.816489	100.404043
Rain Showers,Fog	12.800000	12.100000	96.000000	13.000000	6.400000	99.830000
Rain Showers,Snow Showers	2.150000	-1.500000	76.500000	22.500000	21.700000	101.100000
Rain,Fog	8.273276	7.219828	93.189655	14.793103	6.873276	100.500862
Rain,Haze	4.633333	2.066667	83.333333	11.666667	6.700000	100.540000
Rain,Ice Pellets	0.600000	-0.600000	92.000000	24.000000	9.700000	100.120000
Rain,Snow	1.055556	-0.566667	89.000000	28.388889	11.672222	99.951111

	Temp_C	Dew Point Temp_C	Rel Hum_%	Wind Speed_km/h	Visibility_km	Press_kPa
Weather Condition						
Rain,Snow Grains	1.900000	-2.100000	75.000000	26.000000	25.000000	100.600000
Rain,Snow,Fog	0.800000	0.300000	96.000000	9.000000	6.400000	100.730000
Rain,Snow,Ice Pellets	1.100000	-0.175000	91.500000	23.250000	6.000000	100.105000
Snow	-4.524103	-7.623333	79.307692	20.038462	11.171795	100.536103
Snow Pellets	0.700000	-6.400000	59.000000	35.000000	2.400000	99.700000
Snow Showers	-3.506667	-7.866667	72.350000	19.233333	20.158333	100.963500
Snow Showers,Fog	-10.675000	-11.900000	90.750000	13.750000	7.025000	101.292500
Snow,Blowing Snow	-5.410526	-7.621053	84.473684	34.842105	4.105263	99.704737
Snow,Fog	-5.075676	-6.364865	90.675676	17.324324	4.537838	100.688649
Snow,Haze	-4.020000	-6.860000	80.600000	5.000000	4.640000	100.782000
Snow,Ice Pellets	-1.883333	-3.666667	87.666667	23.833333	7.416667	100.548333
Thunderstorms	24.150000	19.750000	77.000000	7.500000	24.550000	100.230000
Thunderstorms,Heavy Rain Showers	10.900000	9.000000	88.000000	9.000000	2.400000	100.260000
Thunderstorms,Moderate Rain Showers,Fog	19.600000	18.500000	93.000000	15.000000	3.200000	100.010000
Thunderstorms,Rain	20.433333	18.533333	89.000000	15.666667	19.833333	100.420000
Thunderstorms,Rain Showers	20.037500	17.618750	86.375000	18.312500	15.893750	100.233750
Thunderstorms,Rain Showers,Fog	21.600000	18.700000	84.000000	19.666667	9.700000	100.063333
Thunderstorms,Rain,Fog	20.600000	18.600000	88.000000	10.000000	4.800000	100.080000

Q12.Answer

In [52]: `data.head()`

Out[52]:

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

In [53]: `data.groupby('Weather Condition').min()`

Out[53]:

	Date/Time	Temp_C	Dew Point Temp_C	Rel Hum %	Wind Speed_km/h	Visibility_km	Press
Weather Condition							
Clear	1/11/2012 1:00	-23.3	-28.5	20	0	11.3	1012.2
Cloudy	1/1/2012 17:00	-21.4	-26.8	18	0	11.3	1012.2
Drizzle	1/23/2012 21:00	1.1	-0.2	74	0	6.4	1012.2
Drizzle,Fog	1/23/2012 20:00	0.0	-1.6	85	0	1.0	1012.2
Drizzle,Ice Pellets,Fog	12/17/2012 9:00	0.4	-0.7	92	20	4.0	1012.2
Drizzle,Snow	12/17/2012 15:00	0.9	0.1	92	9	9.7	1012.2
Drizzle,Snow,Fog	12/18/2012 21:00	0.3	-0.1	92	7	2.4	1012.2
Fog	1/1/2012 0:00	-16.0	-17.2	80	0	0.2	1012.2
Freezing Drizzle	1/13/2012 10:00	-9.0	-12.2	78	6	4.8	1012.2
Freezing Drizzle,Fog	1/1/2012 2:00	-6.4	-9.0	82	6	3.6	1012.2
Freezing Drizzle,Haze	2/1/2012 11:00	-5.8	-8.3	81	9	2.0	1012.2
Freezing Drizzle,Snow	1/13/2012 3:00	-8.3	-10.4	79	6	2.4	1012.2
Freezing Fog	1/22/2012 6:00	-19.0	-22.9	71	0	0.2	1012.2
Freezing Rain	1/13/2012 11:00	-6.5	-9.0	81	7	2.8	1012.2
Freezing Rain,Fog	1/17/2012 23:00	-6.1	-8.7	82	7	2.8	1012.2
Freezing Rain,Haze	2/1/2012 14:00	-4.9	-7.5	82	6	2.0	1012.2
Freezing Rain,Ice Pellets,Fog	12/17/2012 3:00	-2.6	-3.7	92	28	8.0	1012.2
Freezing Rain,Snow Grains	1/13/2012 9:00	-5.0	-7.3	84	32	4.8	1012.2
Haze	1/22/2012 12:00	-11.5	-16.0	68	0	4.8	1012.2
Mainly Clear	1/10/2012 11:00	-22.8	-28.0	20	0	12.9	1012.2
Moderate Rain,Fog	12/10/2012 8:00	1.7	0.8	94	17	6.4	1012.2

	Date/Time	Temp_C	Dew Point Temp_C	Rel Hum %	Wind Speed_km/h	Visibility_km	Press
Weather Condition							
Moderate Snow	1/12/2012 15:00	-6.3	-7.6	83	26	0.6	99.8
Moderate Snow,Blowing Snow	12/27/2012 10:00	-5.5	-6.6	92	39	0.6	100.0
Mostly Cloudy	1/1/2012 16:00	-23.2	-28.5	18	0	11.3	99.8
Rain	1/1/2012 18:00	0.3	-5.7	40	0	4.0	99.8
Rain Showers	1/1/2012 22:00	1.6	-7.2	37	0	6.4	99.8
Rain Showers,Fog	10/20/2012 3:00	12.8	12.1	96	13	6.4	99.8
Rain Showers,Snow Showers	11/4/2012 8:00	2.1	-1.8	75	17	19.3	100.0
Rain,Fog	1/23/2012 18:00	0.0	-1.2	83	0	2.0	99.8
Rain,Haze	3/13/2012 7:00	4.0	1.0	81	7	4.0	100.0
Rain,Ice Pellets	12/18/2012 5:00	0.6	-0.6	92	24	9.7	100.0
Rain,Snow	1/10/2012 5:00	0.6	-1.7	81	13	2.4	99.8
Rain,Snow Grains	12/21/2012 0:00	1.9	-2.1	75	26	25.0	100.0
Rain,Snow,Fog	12/8/2012 21:00	0.8	0.3	96	9	6.4	100.0
Rain,Snow,Ice Pellets	12/21/2012 1:00	0.9	-0.7	88	17	4.8	99.8
Snow	1/10/2012 1:00	-16.7	-24.6	41	0	1.0	99.8
Snow Pellets	11/24/2012 15:00	0.7	-6.4	59	35	2.4	99.8
Snow Showers	1/12/2012 7:00	-13.3	-19.3	52	0	2.4	99.8
Snow Showers,Fog	12/26/2012 9:00	-11.3	-12.7	89	7	4.0	100.0
Snow,Blowing Snow	1/13/2012 21:00	-12.0	-16.2	70	24	0.6	99.8
Snow,Fog	12/16/2012 15:00	-10.1	-12.0	77	4	1.2	99.8
Snow,Haze	2/1/2012 17:00	-4.3	-7.2	80	0	4.0	100.0

	Date/Time	Temp_C	Dew Point Temp_C	Rel Hum_%	Wind Speed_km/h	Visibility_km	Press
Weather Condition							
Snow,Ice Pellets	12/10/2012 3:00	-4.3	-5.9	76	19	2.8	999.2
Thunderstorms	7/16/2012 1:00	21.6	19.4	67	0	24.1	999.2
Thunderstorms,Heavy Rain Showers	5/29/2012 6:00	10.9	9.0	88	9	2.4	1012.2
Thunderstorms,Moderate Rain Showers,Fog	7/17/2012 6:00	19.6	18.5	93	15	3.2	1012.2
Thunderstorms,Rain	5/25/2012 20:00	19.4	18.2	83	4	16.1	1012.2
Thunderstorms,Rain Showers	5/29/2012 16:00	11.0	7.0	68	7	6.4	999.2
Thunderstorms,Rain Showers,Fog	6/29/2012 3:00	19.5	16.1	80	7	9.7	999.2
Thunderstorms,Rain,Fog	7/17/2012 5:00	20.6	18.6	88	19	4.8	1012.2

In [55]: `data.groupby('Weather Condition').max() #answer`

Out[55]:

	Date/Time	Temp_C	Dew Point Temp_C	Rel Hum %	Wind Speed_km/h	Visibility_km	Press
Weather Condition							
Clear	9/9/2012 5:00	32.8	20.4	99	33	48.3	1000
Cloudy	9/9/2012 23:00	30.5	22.6	99	54	48.3	1000
Drizzle	9/30/2012 3:00	18.8	17.7	96	30	25.0	1000
Drizzle,Fog	9/30/2012 2:00	19.9	19.1	100	28	9.7	1000
Drizzle,Ice Pellets,Fog	12/17/2012 9:00	0.4	-0.7	92	20	4.0	1000
Drizzle,Snow	12/19/2012 18:00	1.2	0.2	95	19	11.3	1000
Drizzle,Snow,Fog	12/22/2012 3:00	1.1	0.6	98	32	9.7	1000
Fog	9/22/2012 0:00	20.8	19.6	100	22	9.7	1000
Freezing Drizzle	2/1/2012 5:00	-2.3	-3.3	93	26	12.9	1000
Freezing Drizzle,Fog	12/10/2012 5:00	-0.3	-2.3	94	33	8.0	1000
Freezing Drizzle,Haze	2/1/2012 13:00	-5.0	-7.7	83	11	4.0	1000
Freezing Drizzle,Snow	3/2/2012 12:00	-3.3	-4.6	94	24	12.9	1000
Freezing Fog	3/17/2012 6:00	-0.1	-0.3	99	9	0.8	1000
Freezing Rain	2/1/2012 7:00	0.3	-1.7	92	28	16.1	1000
Freezing Rain,Fog	12/17/2012 1:00	0.1	-0.9	93	26	9.7	1000
Freezing Rain,Haze	2/1/2012 15:00	-4.9	-7.4	83	9	2.8	1000
Freezing Rain,Ice Pellets,Fog	12/17/2012 3:00	-2.6	-3.7	92	28	8.0	1000
Freezing Rain,Snow Grains	1/13/2012 9:00	-5.0	-7.3	84	32	4.8	990
Haze	3/13/2012 23:00	14.1	11.1	86	17	9.7	1000
Mainly Clear	9/9/2012 9:00	33.0	21.2	99	63	48.3	1000
Moderate Rain,Fog	12/10/2012 8:00	1.7	0.8	94	17	6.4	990

	Date/Time	Temp_C	Dew Point Temp_C	Rel Hum %	Wind Speed_km/h	Visibility_km	Press
Weather Condition							
Moderate Snow	12/27/2012 9:00	-4.9	-6.7	93	39	0.8	1000
Moderate Snow,Blowing Snow	12/27/2012 12:00	-5.4	-6.4	93	41	0.6	1000
Mostly Cloudy	9/9/2012 2:00	32.4	24.4	100	83	48.3	1000
Rain	9/5/2012 2:00	22.8	20.4	99	52	48.3	1000
Rain Showers	9/8/2012 16:00	26.4	23.0	97	41	48.3	1000
Rain Showers,Fog	10/20/2012 3:00	12.8	12.1	96	13	6.4	995
Rain Showers,Snow Showers	12/5/2012 10:00	2.2	-1.2	78	28	24.1	1000
Rain,Fog	9/30/2012 23:00	21.7	19.5	100	46	9.7	1000
Rain,Haze	3/13/2012 9:00	5.5	2.9	86	17	9.7	1000
Rain,Ice Pellets	12/18/2012 5:00	0.6	-0.6	92	24	9.7	1000
Rain,Snow	4/23/2012 3:00	1.7	0.5	94	52	25.0	1000
Rain,Snow Grains	12/21/2012 0:00	1.9	-2.1	75	26	25.0	1000
Rain,Snow,Fog	12/8/2012 21:00	0.8	0.3	96	9	6.4	1000
Rain,Snow,Ice Pellets	12/21/2012 5:00	1.3	0.1	94	28	6.4	1000
Snow	4/27/2012 9:00	3.7	0.3	96	57	25.0	1000
Snow Pellets	11/24/2012 15:00	0.7	-6.4	59	35	2.4	995
Snow Showers	3/4/2012 21:00	2.9	-0.7	94	37	48.3	1000
Snow Showers,Fog	12/29/2012 13:00	-10.0	-11.1	92	22	9.7	1000
Snow,Blowing Snow	2/25/2012 9:00	-1.4	-2.9	91	48	9.7	1000
Snow,Fog	3/14/2012 19:00	1.1	0.8	99	35	9.7	1000
Snow,Haze	2/1/2012 21:00	-3.6	-6.4	81	15	6.4	1000

	Date/Time	Temp_C	Dew Point Temp_C	Rel Hum %	Wind Speed_km/h	Visibility_km	Press
Weather Condition							
Snow,Ice Pellets	3/3/2012 4:00	0.8	-1.7	92	33	11.3	1000
Thunderstorms	7/4/2012 16:00	26.7	20.1	87	15	25.0	1000
Thunderstorms,Heavy Rain Showers	5/29/2012 6:00	10.9	9.0	88	9	2.4	1000
Thunderstorms,Moderate Rain Showers,Fog	7/17/2012 6:00	19.6	18.5	93	15	3.2	1000
Thunderstorms,Rain	7/23/2012 18:00	21.3	19.1	93	30	24.1	1000
Thunderstorms,Rain Showers	9/8/2012 4:00	25.5	23.1	98	32	25.0	1000
Thunderstorms,Rain Showers,Fog	7/31/2012 20:00	22.9	21.3	91	35	9.7	1000
Thunderstorms,Rain,Fog	7/17/2012 5:00	20.6	18.6	88	19	4.8	1000

Q13.Answer

In [56]: `data.head()`

Out[56]:

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

In [58]: `data[data['Weather Condition'] == 'Fog'] #answer`

Out[58]:

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

150 rows × 8 columns



Q14.Answer

In [59]: `data.head()`

Out[59]:

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

In [63]: `data[(data['Weather Condition']=='Clear')|(data['Visibility_km']>40)].tail(50)` #

Weather Data Set

Out[63]:

	Date/Time	Temp_C	Dew Point Temp_C	Rel Hum_%	Wind Speed_km/h	Visibility_km	Press_kPa	Weather Condition
8387	12/15/2012 11:00	-9.3	-14.9	64	19	48.3	102.74	Mainly Clear
8388	12/15/2012 12:00	-9.1	-15.1	62	19	48.3	102.71	Mainly Clear
8389	12/15/2012 13:00	-8.4	-14.7	60	19	48.3	102.64	Clear
8390	12/15/2012 14:00	-8.0	-14.2	61	13	48.3	102.59	Mainly Clear
8391	12/15/2012 15:00	-7.8	-13.7	63	15	48.3	102.55	Mainly Clear
8392	12/15/2012 16:00	-8.5	-14.8	60	20	48.3	102.54	Mainly Clear
8394	12/15/2012 18:00	-9.1	-15.1	62	17	25.0	102.54	Clear
8396	12/15/2012 20:00	-8.7	-15.1	60	20	25.0	102.50	Clear
8408	12/16/2012 8:00	-9.5	-14.8	65	32	48.3	101.85	Cloudy
8599	12/24/2012 7:00	-11.1	-13.9	80	15	25.0	101.23	Clear
8600	12/24/2012 8:00	-11.0	-13.9	79	13	25.0	101.32	Clear
8601	12/24/2012 9:00	-10.5	-13.7	77	13	24.1	101.41	Clear
8602	12/24/2012 10:00	-9.9	-13.4	76	11	48.3	101.45	Mainly Clear
8603	12/24/2012 11:00	-9.0	-13.7	69	11	48.3	101.44	Mainly Clear
8604	12/24/2012 12:00	-7.9	-13.3	65	9	48.3	101.43	Mainly Clear
8605	12/24/2012 13:00	-7.6	-13.1	65	15	48.3	101.45	Mainly Clear
8606	12/24/2012 14:00	-7.8	-13.7	63	15	48.3	101.46	Mainly Clear
8607	12/24/2012 15:00	-7.5	-13.3	63	13	48.3	101.49	Mainly Clear
8610	12/24/2012 18:00	-10.4	-13.8	76	9	25.0	101.45	Clear
8630	12/25/2012 14:00	-7.7	-14.1	60	6	48.3	101.95	Mainly Clear
8631	12/25/2012 15:00	-7.1	-13.7	59	17	48.3	101.98	Clear
8632	12/25/2012 16:00	-7.5	-13.9	60	11	48.3	102.03	Clear

Weather Data Set

	Date/Time	Temp_C	Dew Point Temp_C	Rel Hum_%	Wind Speed_km/h	Visibility_km	Press_kPa	Weather Condition
8633	12/25/2012 17:00	-8.3	-13.4	67	13	25.0	102.10	Clear
8637	12/25/2012 21:00	-9.7	-12.5	80	4	25.0	102.28	Clear
8638	12/25/2012 22:00	-10.9	-13.2	83	4	25.0	102.34	Clear
8639	12/25/2012 23:00	-10.4	-12.7	83	11	25.0	102.45	Clear
8640	12/26/2012 0:00	-11.8	-13.5	87	4	25.0	102.41	Clear
8641	12/26/2012 1:00	-11.2	-12.9	87	6	25.0	102.42	Clear
8642	12/26/2012 2:00	-12.7	-14.4	87	4	25.0	102.45	Clear
8643	12/26/2012 3:00	-14.2	-15.8	88	6	25.0	102.52	Clear
8644	12/26/2012 4:00	-13.1	-14.7	88	6	25.0	102.55	Clear
8645	12/26/2012 5:00	-12.7	-14.1	89	4	25.0	102.48	Clear
8646	12/26/2012 6:00	-13.4	-14.8	89	4	25.0	102.47	Clear
8651	12/26/2012 11:00	-11.3	-14.5	77	20	48.3	102.50	Mainly Clear
8652	12/26/2012 12:00	-10.6	-14.3	74	20	48.3	102.36	Mainly Clear
8698	12/28/2012 10:00	-6.1	-8.6	82	19	24.1	101.27	Clear
8699	12/28/2012 11:00	-6.2	-8.8	82	24	48.3	101.24	Mainly Clear
8700	12/28/2012 12:00	-7.2	-9.9	81	24	48.3	101.22	Mainly Clear
8701	12/28/2012 13:00	-6.8	-9.8	79	20	48.3	101.17	Mainly Clear
8702	12/28/2012 14:00	-6.5	-9.9	77	22	48.3	101.17	Mainly Clear
8703	12/28/2012 15:00	-6.8	-10.3	76	24	48.3	101.22	Mainly Clear
8704	12/28/2012 16:00	-7.7	-11.0	77	30	48.3	101.25	Mainly 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

	Date/Time	Temp_C	Dew Point Temp_C	Rel Hum_%	Wind Speed_km/h	Visibility_km	Press_kPa	Weather Condition
8748	12/30/2012 12:00	-12.2	-15.7	75	26	48.3	100.91	Mostly Cloudy
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

Q15.Answer

In [64]: `data.head()`

Out[64]:

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

In [65]: `data[(data['Weather Condition']=='Clear')&(data['Rel Hum_%']>50)|(data['Visibility']<5)]`

Out[65]:

	Date/Time	Temp_C	Dew Point Temp_C	Rel Hum_%	Wind Speed_km/h	Visibility_km	Press_kPa	Weather Condition
106	1/5/2012 10:00	-6.0	-10.0	73	17	48.3	100.45	Mainly Clear
107	1/5/2012 11:00	-5.6	-10.2	70	22	48.3	100.41	Mainly Clear
108	1/5/2012 12:00	-4.7	-9.6	69	20	48.3	100.38	Mainly Clear
109	1/5/2012 13:00	-4.4	-9.7	66	26	48.3	100.40	Mainly Clear
110	1/5/2012 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 []: