Importing libraries

In [2]:
```
import pandas as pd
import matplotlib.pyplot as plt
import seaborn as sns
import math as m
import numpy as np
```

Reading Dataset ¶

In [3]:
```
df=pd.read_csv("1. Weather Data.csv")
```

understanding the Dataset

Understanding a weather dataset typically involves analyzing and interpreting the various features and parameters contained within it. Weather dataset soften include information like temperature, humidity, precipitation, wind speed, and atmospheric pressure, among other meteorological factors.

In [4]:
```
df
```

Out[4]:

	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

Analyze of Data

In [21]:
```
df.head()
```

Out[21]:

	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 [22]:
```
df.shape
```

Out[22]:
```
(8784, 8)
```

In [23]:
```
df.index
```

Out[23]:
```
RangeIndex(start=0, stop=8784, step=1)
```

In [24]:
```
df.columns
```

Out[24]:
```
Index(['Date/Time', 'Temp_C', 'Dew Point Temp_C', 'Rel Hum_%',
       'Wind Speed_km/h', 'Visibility_km', 'Press_kPa', 'Weather'],
      dtype='object')
```

In [25]:
```
df.dtypes
```

Out[25]:
```
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
```

understanding columns

categorial data

```
Weather
fog
snow
freezing
Drizzle
```

Quantitive data

In [ ]:
```
Date/Time
Temp_C
Dew Point
Rel Hum_%
Wind Speed_km/h
Visibility_km
Press_kPa
```

unique and nunique of data

In [26]:
```
df['Weather'].unique()
```

Out[26]:
```
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 [27]:
```
df.nunique()
```

Out[27]:
```
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 [28]:
```
df.count()
```

Out[28]:
```
Date/Time           8784
Temp_C              8784
Dew Point Temp_C    8784
Rel Hum_%           8784
Wind Speed_km/h     8784
Visibility_km       8784
Press_kPa           8784
Weather             8784
dtype: int64
```

In [29]:
```
df['Weather'].value_counts()
```

Out[29]:
```
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 [30]:
```
df.info()
```

```
<class 'pandas.core.frame.DataFrame'>
RangeIndex: 8784 entries, 0 to 8783
Data columns (total 8 columns):
 #   Column            Non-Null Count  Dtype  
---  ------            --------------  -----  
 0   Date/Time         8784 non-null   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
```

Wind speed

In [31]:
```
df.head(2)
```

Out[31]:

	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 [32]:
```
df.nunique()
```

Out[32]:
```
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 [33]:
```
df['Wind Speed_km/h'].nunique()
```

Out[33]:
```
34
```

In [34]:
```
df['Wind Speed_km/h'].unique()
```

Out[34]:
```
array([ 4,  7,  6,  9, 15, 13, 20, 22, 19, 24, 30, 35, 39, 32, 33, 26, 44,
       43, 48, 37, 28, 17, 11,  0, 83, 70, 57, 46, 41, 52, 50, 63, 54,  2],
      dtype=int64)
```

In [35]:
```
df.Weather.value_counts()
```

Out[35]:
```
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 [36]:
```
df.head(2)
df[df.Weather == 'Clear']
```

Out[36]:

	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 [37]:
```
df.head(2)
df.groupby('Weather').get_group('Clear')
```

Out[37]:

	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

Null values in data

In [38]:
```
df.isnull().sum()
```

Out[38]:
```
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 [39]:
```
df.notnull().sum()
```

Out[39]:
```
Date/Time           8784
Temp_C              8784
Dew Point Temp_C    8784
Rel Hum_%           8784
Wind Speed_km/h     8784
Visibility_km       8784
Press_kPa           8784
Weather             8784
dtype: int64
```

In [40]:
```
df.head()
```

Out[40]:

	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

standard deviation of pressure

In [42]:
```
df.Press_kPa.std()
```

Out[42]:
```
0.8440047459486474
```

variance of relative humidity

In [45]:
```
df['Rel Hum_%'].var()
```

Out[45]:
```
286.2485501984998
```

snow recorded

In [46]:
```
df['Weather'].value_counts()
```

Out[46]:
```
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 [47]:
```
df[df['Weather'] == 'Snow']
```

Out[47]:

	Date/Time	Temp_C	Dew Point Temp_C	Rel Hum_%	Wind Speed_km/h	Visibility_km	Press_kPa	Weather
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 [48]:
```
df[df['Weather'].str.contains('Snow')].head(50)
```

Out[48]:

	Date/Time	Temp_C	Dew Point Temp_C	Rel Hum_%	Wind Speed_km/h	Visibility_km	Press_kPa	Weather
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
50	1/3/2012 2:00	-10.5	-15.8	65	22	12.9	100.53	Snow Showers
51	1/3/2012 3:00	-11.3	-18.7	54	33	25.0	100.61	Snow Showers
53	1/3/2012 5:00	-12.9	-19.1	60	22	25.0	100.76	Snow Showers
54	1/3/2012 6:00	-13.3	-19.3	61	19	25.0	100.85	Snow Showers
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
89	1/4/2012 17:00	-8.9	-13.2	71	9	4.8	100.76	Snow
90	1/4/2012 18:00	-8.9	-12.6	75	11	9.7	100.69	Snow
91	1/4/2012 19:00	-8.4	-12.7	71	9	16.1	100.65	Snow
92	1/4/2012 20:00	-7.8	-12.1	71	9	16.1	100.61	Snow
93	1/4/2012 21:00	-7.6	-11.6	73	7	11.3	100.54	Snow
94	1/4/2012 22:00	-9.5	-12.7	77	6	9.7	100.50	Snow
95	1/4/2012 23:00	-9.6	-12.6	79	6	9.7	100.42	Snow
96	1/5/2012 0:00	-8.8	-11.7	79	4	9.7	100.32	Snow
97	1/5/2012 1:00	-7.5	-10.2	81	0	9.7	100.29	Snow

	Date/Time	Temp_C	Dew Point Temp_C	Rel Hum_%	Wind Speed_km/h	Visibility_km	Press_kPa	Weather
98	1/5/2012 2:00	-5.4	-8.3	80	9	8.0	100.28	Snow
99	1/5/2012 3:00	-5.0	-7.7	81	11	9.7	100.24	Snow
100	1/5/2012 4:00	-4.1	-6.5	83	9	4.8	100.21	Snow
101	1/5/2012 5:00	-7.0	-9.5	82	4	4.0	100.19	Snow
102	1/5/2012 6:00	-8.2	-10.7	82	6	6.4	100.26	Snow
103	1/5/2012 7:00	-7.1	-9.7	82	9	9.7	100.31	Snow
104	1/5/2012 8:00	-6.1	-9.1	79	11	9.7	100.39	Snow
123	1/6/2012 3:00	-10.6	-16.0	64	0	9.7	100.76	Snow
124	1/6/2012 4:00	-11.3	-16.1	68	15	3.2	100.70	Snow
125	1/6/2012 5:00	-11.8	-16.0	71	19	2.8	100.61	Snow
126	1/6/2012 6:00	-12.0	-16.2	71	22	4.8	100.58	Snow
127	1/6/2012 7:00	-14.4	-16.3	85	22	2.4	100.52	Snow
128	1/6/2012 8:00	-12.3	-16.2	73	24	11.3	100.51	Snow
129	1/6/2012 9:00	-12.5	-16.7	71	26	19.3	100.53	Snow
130	1/6/2012 10:00	-12.3	-16.3	72	28	16.1	100.47	Snow
131	1/6/2012 11:00	-12.0	-16.0	72	17	24.1	100.36	Snow
132	1/6/2012 12:00	-11.7	-15.4	74	28	19.3	100.23	Snow
133	1/6/2012 13:00	-11.9	-15.6	74	20	24.1	100.13	Snow
134	1/6/2012 14:00	-11.2	-14.8	75	19	19.3	100.07	Snow
135	1/6/2012 15:00	-11.5	-14.4	79	19	12.9	100.06	Snow
136	1/6/2012 16:00	-11.6	-14.7	78	19	19.3	100.10	Snow
137	1/6/2012 17:00	-11.2	-14.3	78	17	25.0	100.15	Snow
158	1/7/2012 14:00	-4.4	-6.9	83	6	8.0	100.09	Snow

	Date/Time	Temp_C	Dew Point Temp_C	Rel Hum_%	Wind Speed_km/h	Visibility_km	Press_kPa	Weather
159	1/7/2012 15:00	-3.7	-6.1	83	11	8.0	100.09	Snow
160	1/7/2012 16:00	-3.6	-5.9	84	0	8.0	100.15	Snow
161	1/7/2012 17:00	-3.1	-5.4	84	13	8.0	100.27	Snow
162	1/7/2012 18:00	-3.2	-5.3	85	6	9.7	100.33	Snow

In [49]:
```
df[df['Weather'].str.contains('Snow')].tail(50)
```

Out[49]:

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

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

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

mean value of each column

In [50]:
```
df.head(2)
```

Out[50]:

	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 [51]:
```
df.groupby('Weather').mean()
```

Out[51]:

Weather	Temp_C	Dew Point Temp_C	Rel Hum_%	Wind Speed_km/h	Visibility_km	Press_kP
Clear	6.825716	0.089367	64.497738	10.557315	30.153243	101.58744
Cloudy	7.970544	2.375810	69.592593	16.127315	26.625752	100.91144
Drizzle	7.353659	5.504878	88.243902	16.097561	17.931707	100.43536
Drizzle,Fog	8.067500	7.033750	93.275000	11.862500	5.257500	100.78662
Drizzle,Ice Pellets,Fog	0.400000	-0.700000	92.000000	20.000000	4.000000	100.79000
Drizzle,Snow	1.050000	0.150000	93.500000	14.000000	10.500000	100.89000
Drizzle,Snow,Fog	0.693333	0.120000	95.866667	15.533333	5.513333	99.28133
Fog	4.303333	3.159333	92.286667	7.946667	6.248000	101.18406
Freezing Drizzle	-5.657143	-8.000000	83.571429	16.571429	9.200000	100.20285
Freezing Drizzle,Fog	-2.533333	-4.183333	88.500000	17.000000	5.266667	100.44166
Freezing Drizzle,Haze	-5.433333	-8.000000	82.000000	10.333333	2.666667	100.31666
Freezing Drizzle,Snow	-5.109091	-7.072727	86.090909	16.272727	5.872727	100.52090
Freezing Fog	-7.575000	-9.250000	87.750000	4.750000	0.650000	102.32000
Freezing Rain	-3.885714	-6.078571	84.642857	19.214286	8.242857	99.64714
Freezing Rain,Fog	-2.225000	-3.750000	89.500000	15.500000	7.550000	99.94500
Freezing Rain,Haze	-4.900000	-7.450000	82.500000	7.500000	2.400000	100.37500
Freezing Rain,Ice Pellets,Fog	-2.600000	-3.700000	92.000000	28.000000	8.000000	100.95000
Freezing Rain,Snow Grains	-5.000000	-7.300000	84.000000	32.000000	4.800000	98.56000
Haze	-0.200000	-2.975000	81.625000	10.437500	7.831250	101.48250
Mainly Clear	12.558927	4.581671	60.667142	14.144824	34.264862	101.24883
Moderate Rain,Fog	1.700000	0.800000	94.000000	17.000000	6.400000	99.98000
Moderate Snow	-5.525000	-7.250000	87.750000	33.750000	0.750000	100.27500
Moderate Snow,Blowing Snow	-5.450000	-6.500000	92.500000	40.000000	0.600000	100.57000
Mostly Cloudy	10.574287	3.131174	62.102465	15.813920	31.253842	101.02528
Rain	9.786275	7.042810	83.624183	19.254902	18.856536	100.23333
Rain Showers	13.722340	9.187766	75.159574	17.132979	22.816489	100.40404
Rain Showers,Fog	12.800000	12.100000	96.000000	13.000000	6.400000	99.83000
Rain Showers,Snow Showers	2.150000	-1.500000	76.500000	22.500000	21.700000	101.10000
Rain,Fog	8.273276	7.219828	93.189655	14.793103	6.873276	100.50086
Rain,Haze	4.633333	2.066667	83.333333	11.666667	6.700000	100.54000
Rain,Ice Pellets	0.600000	-0.600000	92.000000	24.000000	9.700000	100.12000
Rain,Snow	1.055556	-0.566667	89.000000	28.388889	11.672222	99.95111

Weather	Temp_C	Dew Point Temp_C	Rel Hum_%	Wind Speed_km/h	Visibility_km	Press_kP
Rain,Snow Grains	1.900000	-2.100000	75.000000	26.000000	25.000000	100.60000
Rain,Snow,Fog	0.800000	0.300000	96.000000	9.000000	6.400000	100.73000
Rain,Snow,Ice Pellets	1.100000	-0.175000	91.500000	23.250000	6.000000	100.10500
Snow	-4.524103	-7.623333	79.307692	20.038462	11.171795	100.53610
Snow Pellets	0.700000	-6.400000	59.000000	35.000000	2.400000	99.70000
Snow Showers	-3.506667	-7.866667	72.350000	19.233333	20.158333	100.96350
Snow Showers,Fog	-10.675000	-11.900000	90.750000	13.750000	7.025000	101.29250
Snow,Blowing Snow	-5.410526	-7.621053	84.473684	34.842105	4.105263	99.70473
Snow,Fog	-5.075676	-6.364865	90.675676	17.324324	4.537838	100.68864
Snow,Haze	-4.020000	-6.860000	80.600000	5.000000	4.640000	100.78200
Snow,Ice Pellets	-1.883333	-3.666667	87.666667	23.833333	7.416667	100.54833
Thunderstorms	24.150000	19.750000	77.000000	7.500000	24.550000	100.23000
Thunderstorms,Heavy Rain Showers	10.900000	9.000000	88.000000	9.000000	2.400000	100.26000
Thunderstorms,Moderate Rain Showers,Fog	19.600000	18.500000	93.000000	15.000000	3.200000	100.01000
Thunderstorms,Rain	20.433333	18.533333	89.000000	15.666667	19.833333	100.42000
Thunderstorms,Rain Showers	20.037500	17.618750	86.375000	18.312500	15.893750	100.23375
Thunderstorms,Rain Showers,Fog	21.600000	18.700000	84.000000	19.666667	9.700000	100.06333
Thunderstorms,Rain,Fog	20.600000	18.600000	88.000000	19.000000	4.800000	100.08000

Maximum and minimum

In [52]:
```
df.head(2)
```

Out[52]:

	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 [53]:
```
df.groupby('Weather').min()
```

Out[53]:

Weather	Date/Time	Temp_C	Dew Point Temp_C	Rel Hum_%	Wind Speed_km/h	Visibility_km	Pres
Clear	1/11/2012 1:00	-23.3	-28.5	20	0	11.3	
Cloudy	1/1/2012 17:00	-21.4	-26.8	18	0	11.3	
Drizzle	1/23/2012 21:00	1.1	-0.2	74	0	6.4	
Drizzle,Fog	1/23/2012 20:00	0.0	-1.6	85	0	1.0	
Drizzle,Ice Pellets,Fog	12/17/2012 9:00	0.4	-0.7	92	20	4.0	
Drizzle,Snow	12/17/2012 15:00	0.9	0.1	92	9	9.7	
Drizzle,Snow,Fog	12/18/2012 21:00	0.3	-0.1	92	7	2.4	
Fog	1/1/2012 0:00	-16.0	-17.2	80	0	0.2	
Freezing Drizzle	1/13/2012 10:00	-9.0	-12.2	78	6	4.8	
Freezing Drizzle,Fog	1/1/2012 2:00	-6.4	-9.0	82	6	3.6	
Freezing Drizzle,Haze	2/1/2012 11:00	-5.8	-8.3	81	9	2.0	
Freezing Drizzle,Snow	1/13/2012 3:00	-8.3	-10.4	79	6	2.4	
Freezing Fog	1/22/2012 6:00	-19.0	-22.9	71	0	0.2	
Freezing Rain	1/13/2012 11:00	-6.5	-9.0	81	7	2.8	
Freezing Rain,Fog	1/17/2012 23:00	-6.1	-8.7	82	7	2.8	
Freezing Rain,Haze	2/1/2012 14:00	-4.9	-7.5	82	6	2.0	
Freezing Rain,Ice Pellets,Fog	12/17/2012 3:00	-2.6	-3.7	92	28	8.0	
Freezing Rain,Snow Grains	1/13/2012 9:00	-5.0	-7.3	84	32	4.8	
Haze	1/22/2012 12:00	-11.5	-16.0	68	0	4.8	
Mainly Clear	1/10/2012 11:00	-22.8	-28.0	20	0	12.9	
Moderate Rain,Fog	12/10/2012 8:00	1.7	0.8	94	17	6.4	
Moderate Snow	1/12/2012 15:00	-6.3	-7.6	83	26	0.6	

Weather	Date/Time	Temp_C	Dew Point Temp_C	Rel Hum_%	Wind Speed_km/h	Visibility_km	Pres
Moderate Snow,Blowing Snow	12/27/2012 10:00	-5.5	-6.6	92	39	0.6	
Mostly Cloudy	1/1/2012 16:00	-23.2	-28.5	18	0	11.3	
Rain	1/1/2012 18:00	0.3	-5.7	40	0	4.0	
Rain Showers	1/1/2012 22:00	1.6	-7.2	37	0	6.4	
Rain Showers,Fog	10/20/2012 3:00	12.8	12.1	96	13	6.4	
Rain Showers,Snow Showers	11/4/2012 8:00	2.1	-1.8	75	17	19.3	
Rain,Fog	1/23/2012 18:00	0.0	-1.2	83	0	2.0	
Rain,Haze	3/13/2012 7:00	4.0	1.0	81	7	4.0	
Rain,Ice Pellets	12/18/2012 5:00	0.6	-0.6	92	24	9.7	
Rain,Snow	1/10/2012 5:00	0.6	-1.7	81	13	2.4	
Rain,Snow Grains	12/21/2012 0:00	1.9	-2.1	75	26	25.0	
Rain,Snow,Fog	12/8/2012 21:00	0.8	0.3	96	9	6.4	
Rain,Snow,Ice Pellets	12/21/2012 1:00	0.9	-0.7	88	17	4.8	
Snow	1/10/2012 1:00	-16.7	-24.6	41	0	1.0	
Snow Pellets	11/24/2012 15:00	0.7	-6.4	59	35	2.4	
Snow Showers	1/12/2012 7:00	-13.3	-19.3	52	0	2.4	
Snow Showers,Fog	12/26/2012 9:00	-11.3	-12.7	89	7	4.0	
Snow,Blowing Snow	1/13/2012 21:00	-12.0	-16.2	70	24	0.6	
Snow,Fog	12/16/2012 15:00	-10.1	-12.0	77	4	1.2	
Snow,Haze	2/1/2012 17:00	-4.3	-7.2	80	0	4.0	
Snow,Ice Pellets	12/10/2012 3:00	-4.3	-5.9	76	19	2.8	
Thunderstorms	7/16/2012 1:00	21.6	19.4	67	0	24.1	

Weather	Date/Time	Temp_C	Dew Point Temp_C	Rel Hum_%	Wind Speed_km/h	Visibility_km	Pres
Thunderstorms,Heavy Rain Showers	5/29/2012 6:00	10.9	9.0	88	9	2.4	
Thunderstorms,Moderate Rain Showers,Fog	7/17/2012 6:00	19.6	18.5	93	15	3.2	
Thunderstorms,Rain	5/25/2012 20:00	19.4	18.2	83	4	16.1	
Thunderstorms,Rain Showers	5/29/2012 16:00	11.0	7.0	68	7	6.4	
Thunderstorms,Rain Showers,Fog	6/29/2012 3:00	19.5	16.1	80	7	9.7	
Thunderstorms,Rain,Fog	7/17/2012 5:00	20.6	18.6	88	19	4.8	

In [54]:
```
df.groupby('Weather').max()
```

Out[54]:

Weather	Date/Time	Temp_C	Dew Point Temp_C	Rel Hum_%	Wind Speed_km/h	Visibility_km	Pres
Clear	9/9/2012 5:00	32.8	20.4	99	33	48.3	
Cloudy	9/9/2012 23:00	30.5	22.6	99	54	48.3	
Drizzle	9/30/2012 3:00	18.8	17.7	96	30	25.0	
Drizzle,Fog	9/30/2012 2:00	19.9	19.1	100	28	9.7	
Drizzle,Ice Pellets,Fog	12/17/2012 9:00	0.4	-0.7	92	20	4.0	
Drizzle,Snow	12/19/2012 18:00	1.2	0.2	95	19	11.3	
Drizzle,Snow,Fog	12/22/2012 3:00	1.1	0.6	98	32	9.7	
Fog	9/22/2012 0:00	20.8	19.6	100	22	9.7	
Freezing Drizzle	2/1/2012 5:00	-2.3	-3.3	93	26	12.9	
Freezing Drizzle,Fog	12/10/2012 5:00	-0.3	-2.3	94	33	8.0	
Freezing Drizzle,Haze	2/1/2012 13:00	-5.0	-7.7	83	11	4.0	
Freezing Drizzle,Snow	3/2/2012 12:00	-3.3	-4.6	94	24	12.9	
Freezing Fog	3/17/2012 6:00	-0.1	-0.3	99	9	0.8	
Freezing Rain	2/1/2012 7:00	0.3	-1.7	92	28	16.1	
Freezing Rain,Fog	12/17/2012 1:00	0.1	-0.9	93	26	9.7	
Freezing Rain,Haze	2/1/2012 15:00	-4.9	-7.4	83	9	2.8	
Freezing Rain,Ice Pellets,Fog	12/17/2012 3:00	-2.6	-3.7	92	28	8.0	
Freezing Rain,Snow Grains	1/13/2012 9:00	-5.0	-7.3	84	32	4.8	
Haze	3/13/2012 23:00	14.1	11.1	86	17	9.7	
Mainly Clear	9/9/2012 9:00	33.0	21.2	99	63	48.3	
Moderate Rain,Fog	12/10/2012 8:00	1.7	0.8	94	17	6.4	
Moderate Snow	12/27/2012 9:00	-4.9	-6.7	93	39	0.8	

Weather	Date/Time	Temp_C	Dew Point Temp_C	Rel Hum_%	Wind Speed_km/h	Visibility_km	Pres
Moderate Snow,Blowing Snow	12/27/2012 12:00	-5.4	-6.4	93	41	0.6	
Mostly Cloudy	9/9/2012 2:00	32.4	24.4	100	83	48.3	
Rain	9/5/2012 2:00	22.8	20.4	99	52	48.3	
Rain Showers	9/8/2012 16:00	26.4	23.0	97	41	48.3	
Rain Showers,Fog	10/20/2012 3:00	12.8	12.1	96	13	6.4	
Rain Showers,Snow Showers	12/5/2012 10:00	2.2	-1.2	78	28	24.1	
Rain,Fog	9/30/2012 23:00	21.7	19.5	100	46	9.7	
Rain,Haze	3/13/2012 9:00	5.5	2.9	86	17	9.7	
Rain,Ice Pellets	12/18/2012 5:00	0.6	-0.6	92	24	9.7	
Rain,Snow	4/23/2012 3:00	1.7	0.5	94	52	25.0	
Rain,Snow Grains	12/21/2012 0:00	1.9	-2.1	75	26	25.0	
Rain,Snow,Fog	12/8/2012 21:00	0.8	0.3	96	9	6.4	
Rain,Snow,Ice Pellets	12/21/2012 5:00	1.3	0.1	94	28	6.4	
Snow	4/27/2012 9:00	3.7	0.3	96	57	25.0	
Snow Pellets	11/24/2012 15:00	0.7	-6.4	59	35	2.4	
Snow Showers	3/4/2012 21:00	2.9	-0.7	94	37	48.3	
Snow Showers,Fog	12/29/2012 13:00	-10.0	-11.1	92	22	9.7	
Snow,Blowing Snow	2/25/2012 9:00	-1.4	-2.9	91	48	9.7	
Snow,Fog	3/14/2012 19:00	1.1	0.8	99	35	9.7	
Snow,Haze	2/1/2012 21:00	-3.6	-6.4	81	15	6.4	
Snow,Ice Pellets	3/3/2012 4:00	0.8	-1.7	92	33	11.3	
Thunderstorms	7/4/2012 16:00	26.7	20.1	87	15	25.0	

Weather	Date/Time	Temp_C	Dew Point Temp_C	Rel Hum_%	Wind Speed_km/h	Visibility_km	Pres
Thunderstorms,Heavy Rain Showers	5/29/2012 6:00	10.9	9.0	88	9	2.4	
Thunderstorms,Moderate Rain Showers,Fog	7/17/2012 6:00	19.6	18.5	93	15	3.2	
Thunderstorms,Rain	7/23/2012 18:00	21.3	19.1	93	30	24.1	
Thunderstorms,Rain Showers	9/8/2012 4:00	25.5	23.1	98	32	25.0	
Thunderstorms,Rain Showers,Fog	7/31/2012 20:00	22.9	21.3	91	35	9.7	
Thunderstorms,Rain,Fog	7/17/2012 5:00	20.6	18.6	88	19	4.8	

Data Visualisation

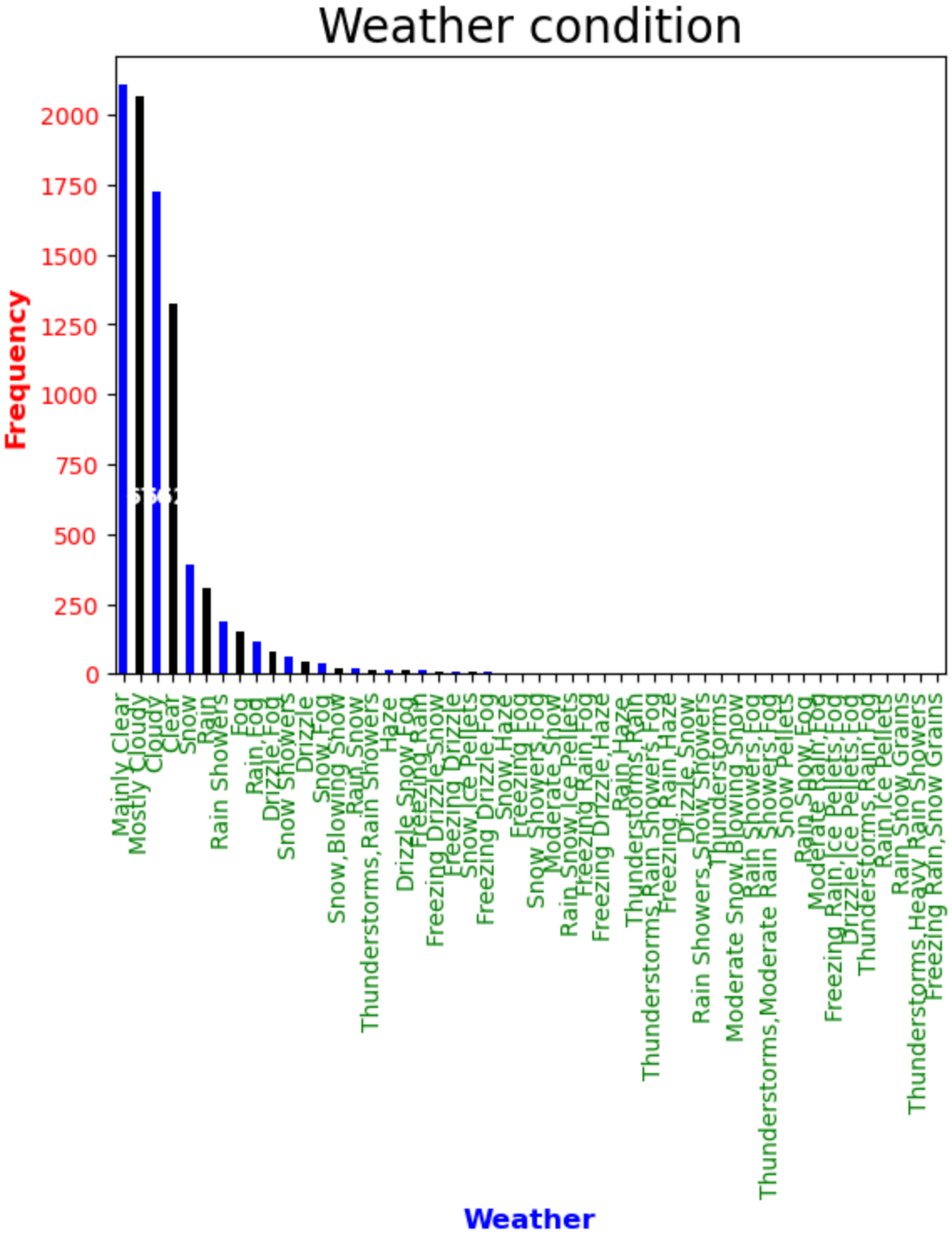
Univariant Analysis

categorial data

In [55]:
```
df.info()
```

```
<class 'pandas.core.frame.DataFrame'>
RangeIndex: 8784 entries, 0 to 8783
Data columns (total 8 columns):
 #   Column            Non-Null Count  Dtype  
---  ------            --------------  -----  
 0   Date/Time         8784 non-null   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
```

In [6]:
```
df['Weather'].value_counts().plot(kind='bar',color=(['Blue','Black']))

plt.title('Weather condition',size=20,c='Black')

plt.xlabel('Weather',c='Blue',size=12,fontweight='bold')
plt.ylabel('Frequency',c='red',size=12,fontweight='bold')

plt.text(0,610,'676',color='white',size=10,fontweight='bold')
plt.text(1,610,'662',color='white',size=10,fontweight='bold')

plt.xticks(rotation='vertical',color='Green',fontsize=10)
plt.yticks(color='red',fontsize=10)

plt.show()
```

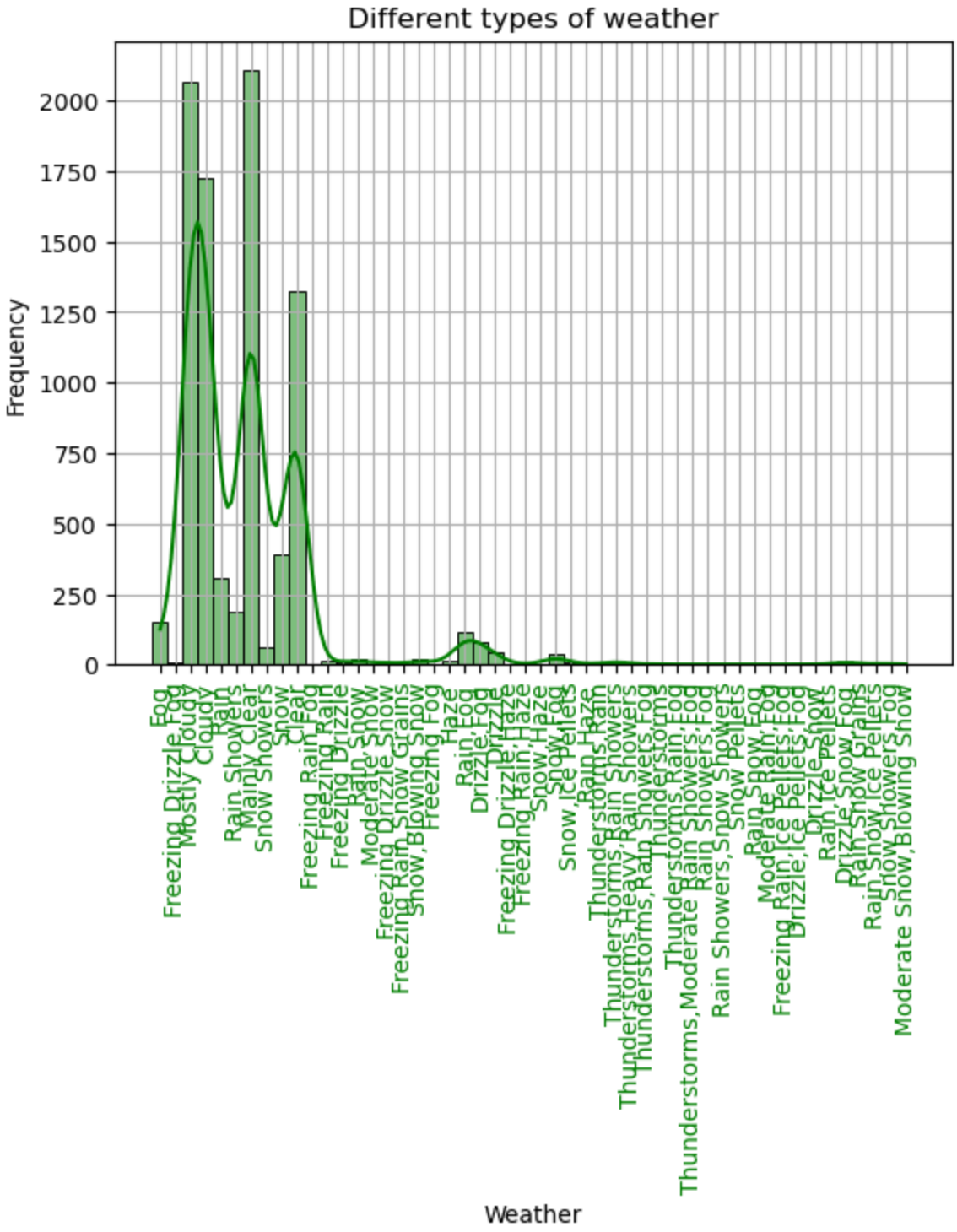


Univariate Analysis

Kde of Weather

```
In Python's seaborn library, kde stands for Kernel Density Estimation,
a method used to estimate the probability density function of a continuous
variable.
```

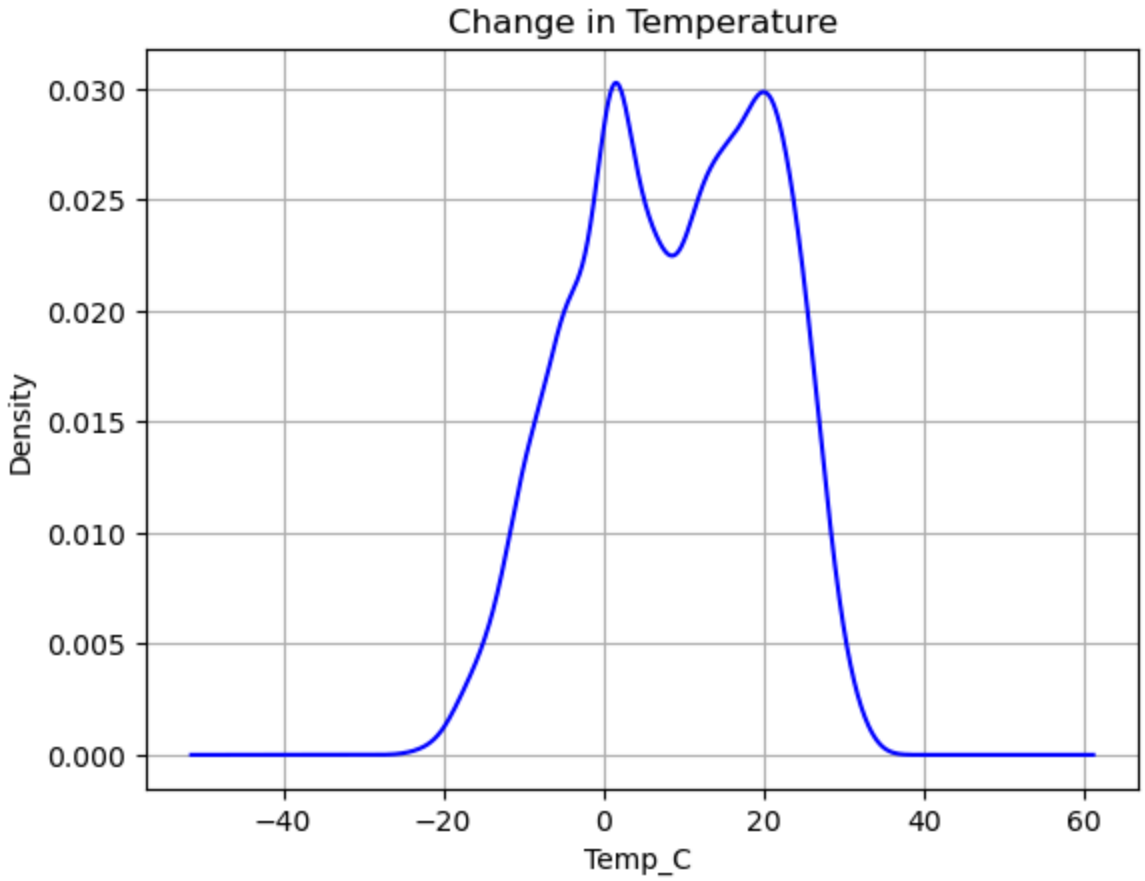
In [8]:
```
sns.histplot(df['Weather'], kde=True, color='g')
plt.title('Different types of weather')
plt.xlabel('Weather')
plt.ylabel('Frequency')
plt.xticks(rotation='vertical',color='Green',fontsize=10)
plt.yticks(color='Black',fontsize=10)
plt.grid()
plt.show()
```



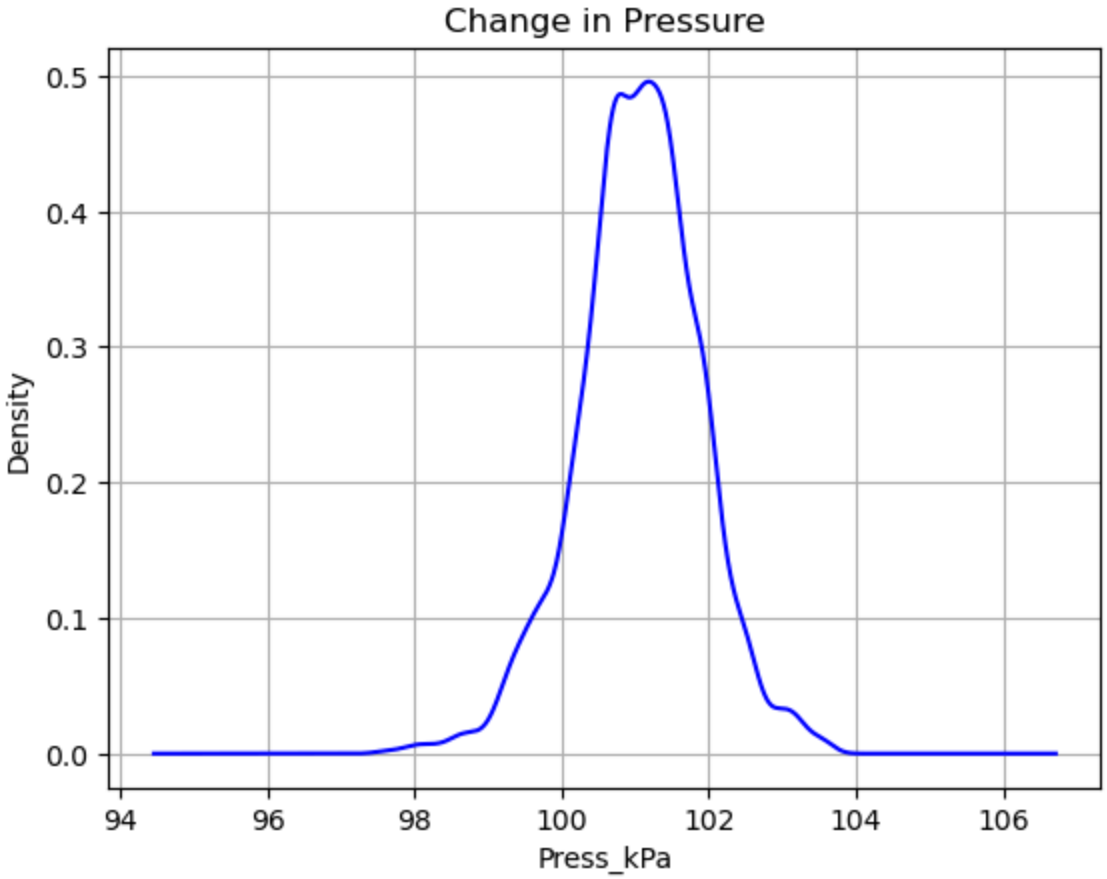
In [9]:
```
df.dtypes
```

Out[9]:
```
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
```

In [12]:
```
df['Temp_C'].plot(kind='kde',c='b')
plt.title('Change in Temperature')
plt.xlabel('Temp_C ')
plt.grid()
plt.show()
```



In [15]:
```
df['Press_kPa'].plot(kind='kde',c='b')
plt.title('Change in Pressure')
plt.xlabel('Press_kPa')
plt.grid()
plt.show()
```

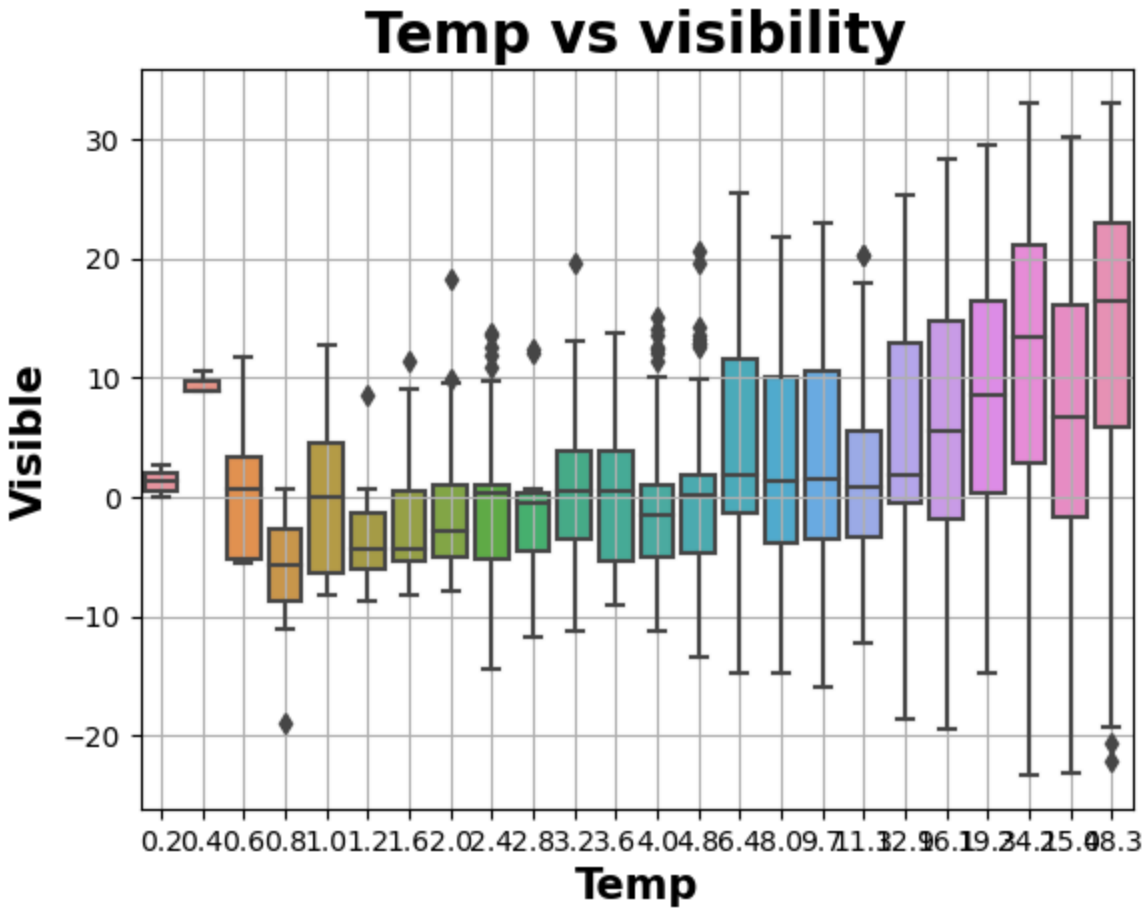


Box plot

A box plot in Python, created using matplotlib, is a graphical representation of the distribution of a dataset through five key values: minimum, first quartile (Q1), median (second quartile or Q2), third quartile (Q3), and maximum.

Based on Temperature an Visibility.

In [65]:
```
sns.boxplot(data=df,y='Temp_C',x='Visibility_km')

plt.xticks(color='k')
plt.yticks(color='k')

plt.title('Temp vs visibility',size=20,c='Black',fontweight='bold')

plt.xlabel('Temp',size=15,fontweight='bold')
plt.ylabel('Visible',size=15,fontweight='bold')

plt.grid()

plt.show()
```

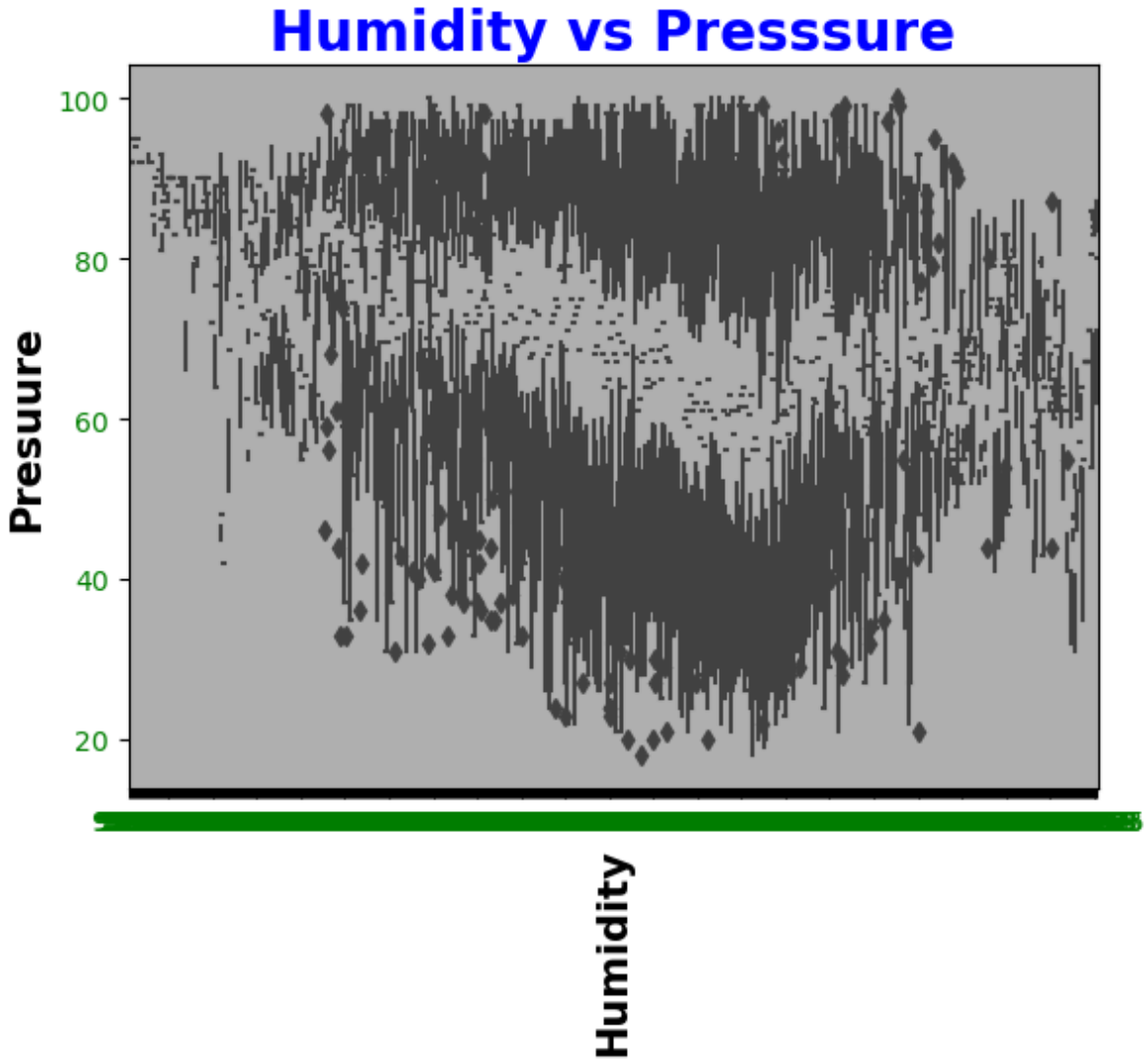


In [66]:
```
df.dtypes
```

Out[66]:
```
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
```

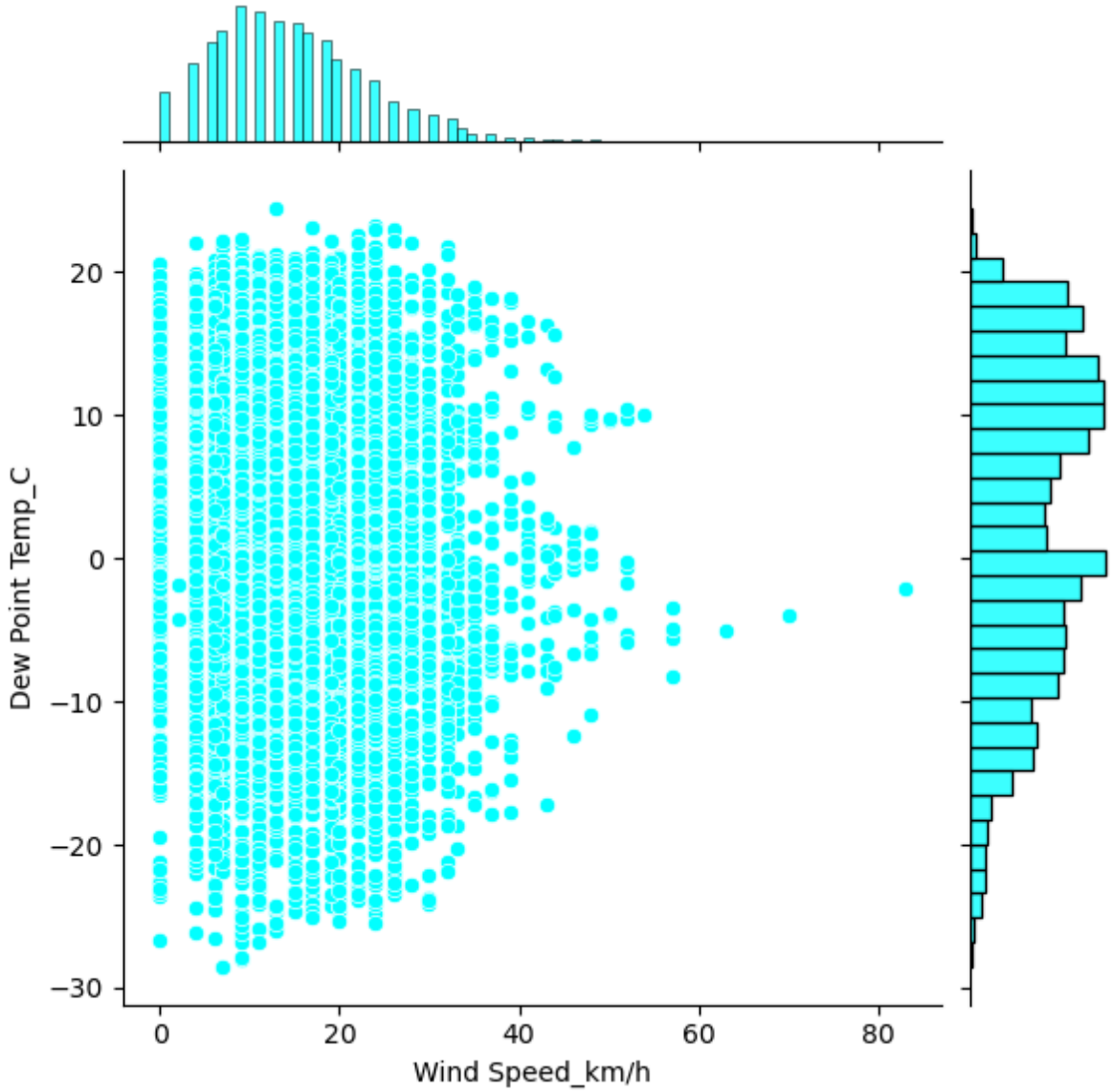
Based on Rel humidity and Pressure.

In [72]:
```
sns.boxplot(data=df,y='Rel Hum_%',x='Press_kPa')

plt.xticks(color='g')
plt.yticks(color='g')

plt.title('Humidity vs Presssure',size=20,c='Blue',fontweight='bold')

plt.xlabel('Humidity',rotation='vertical',size=15,fontweight='bold')
plt.ylabel('Presuure',size=15,fontweight='bold')

plt.grid()

plt.show()
```

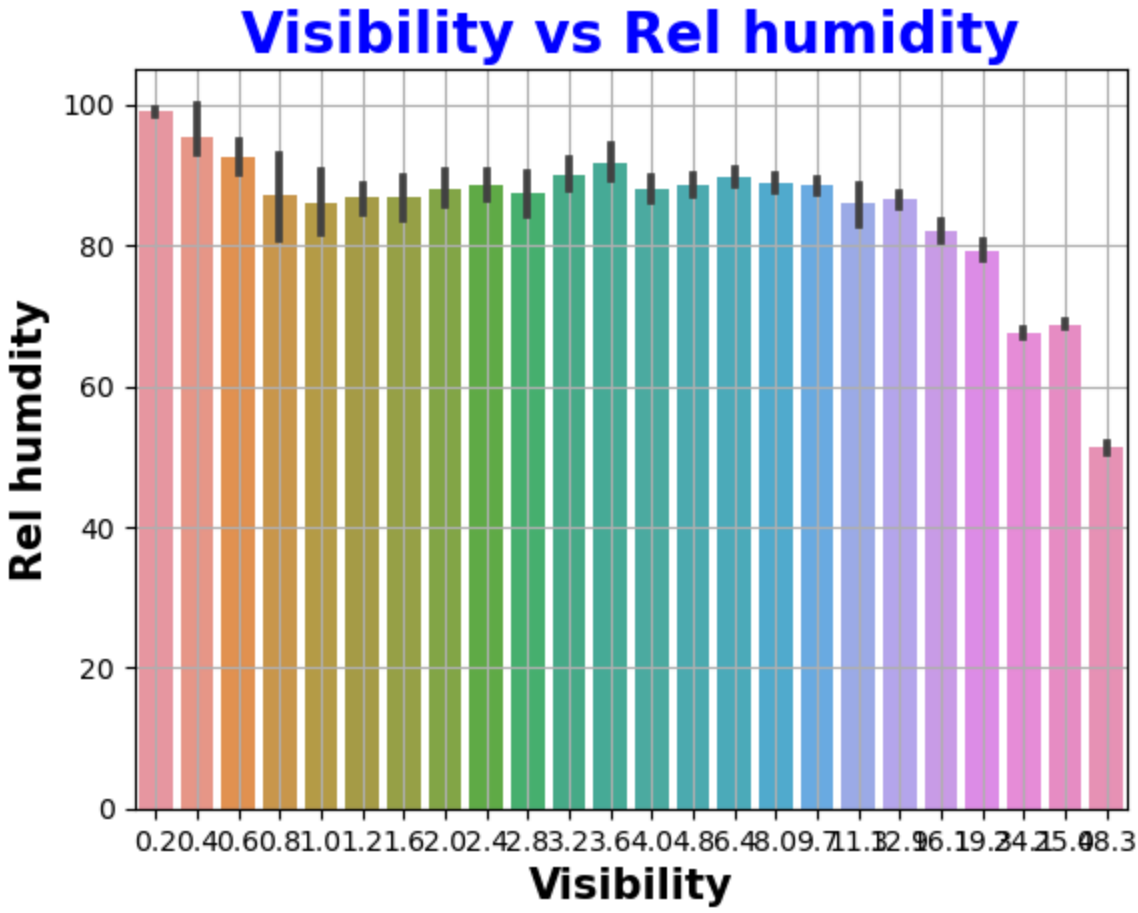


Relation between Wind and Dew Point

In [78]:
```
sns.jointplot(data=df,x='Wind Speed_km/h',y='Dew Point Temp_C',color='cyan')

plt.xticks(color='k')
plt.yticks(color='k')

plt.xlabel('Wind',size=15,fontweight='bold')
plt.ylabel('Dew Point',size=15,fontweight='bold')

plt.show()
```



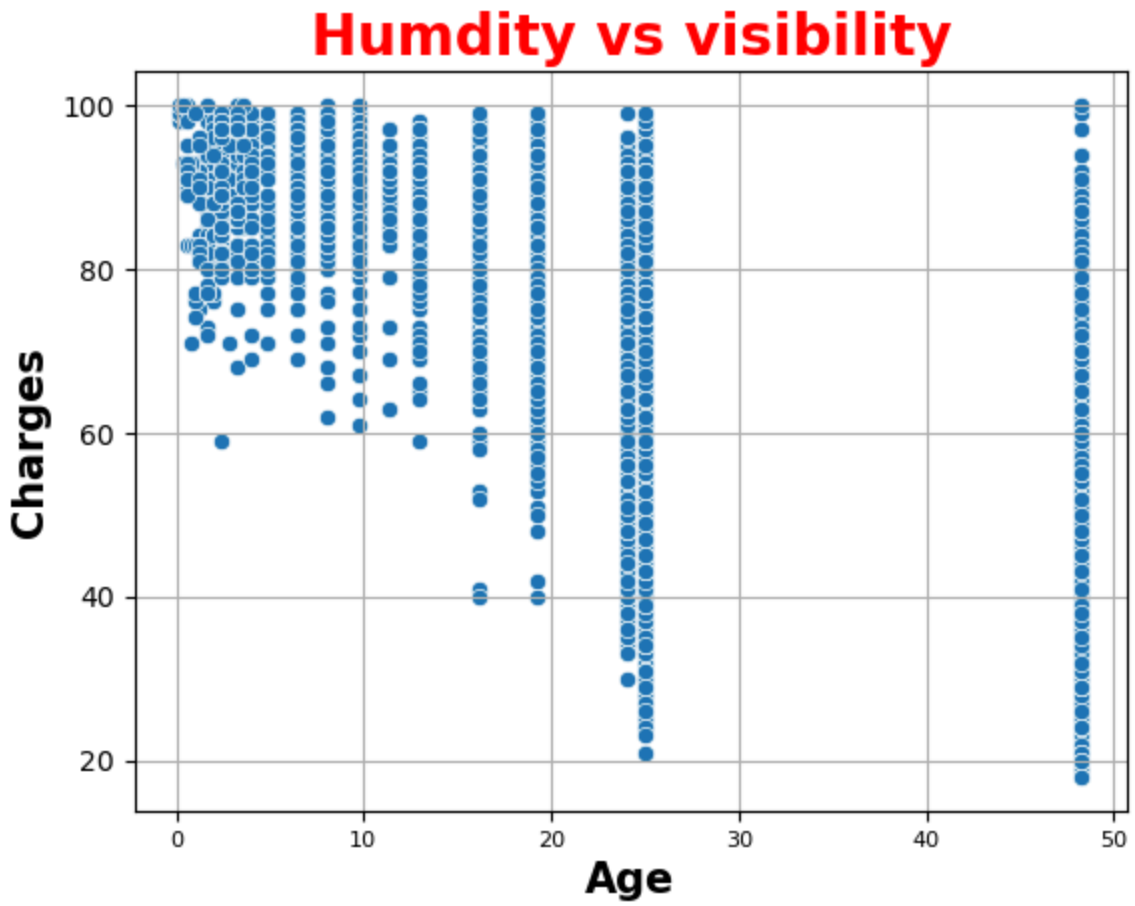
In [5]:
```
sns.barplot(data=df,x='Visibility_km',y='Rel Hum_%')

plt.xticks(color='k')
plt.yticks(color='k')

plt.title('Visibility vs Rel humidity',size=20,c='Blue',fontweight='bold')

plt.xlabel('Visibility',size=15,fontweight='bold')
plt.ylabel('Rel humdity',size=15,fontweight='bold')

plt.grid()

plt.show()
```



Bivariate Analysis

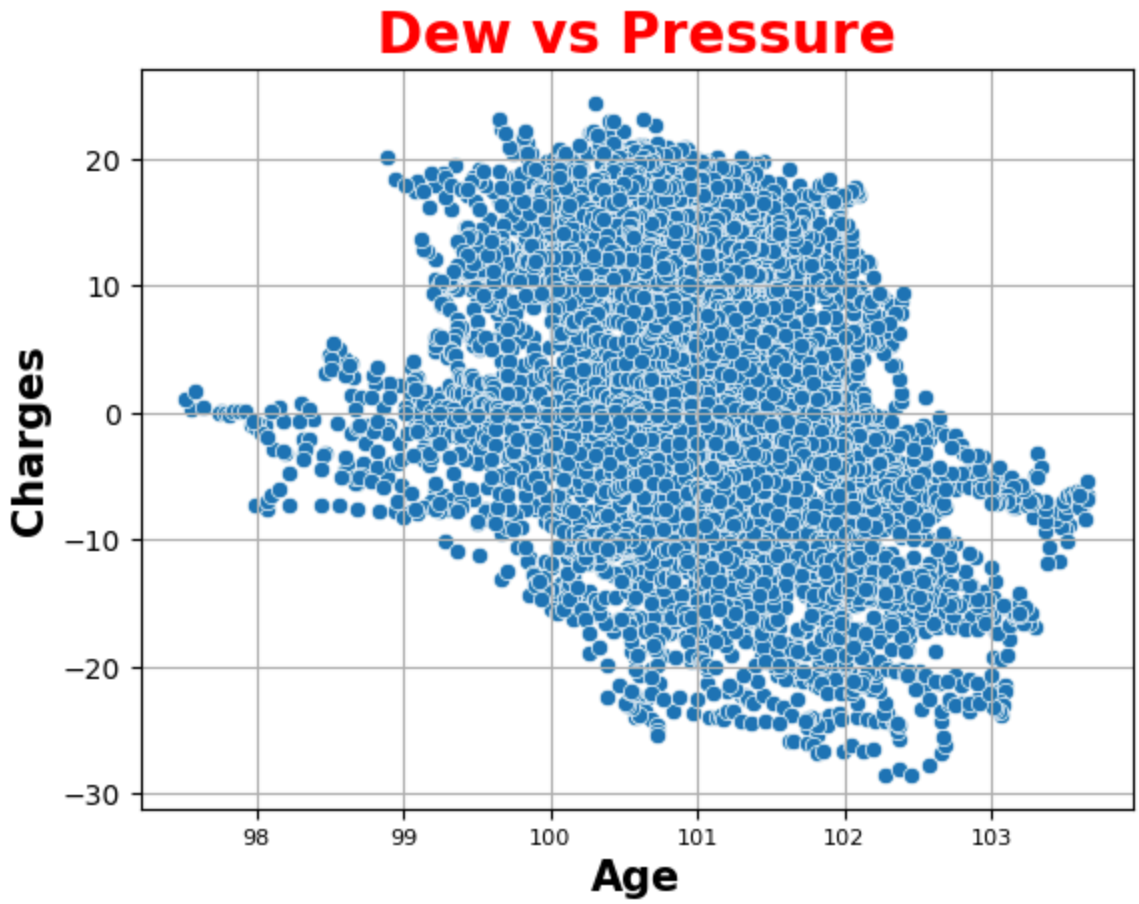
Relation Between Humdity and visibility

In [79]:
```
sns.scatterplot(data=df,y='Rel Hum_%',x='Visibility_km')

plt.xticks(color='k',size=8)
plt.yticks(color='k')

plt.title('Humdity vs visibility',size=20,c='red',fontweight='bold')

plt.xlabel('Age',size=15,fontweight='bold')
plt.ylabel('Charges',size=15,fontweight='bold')

plt.grid()

plt.show()
```

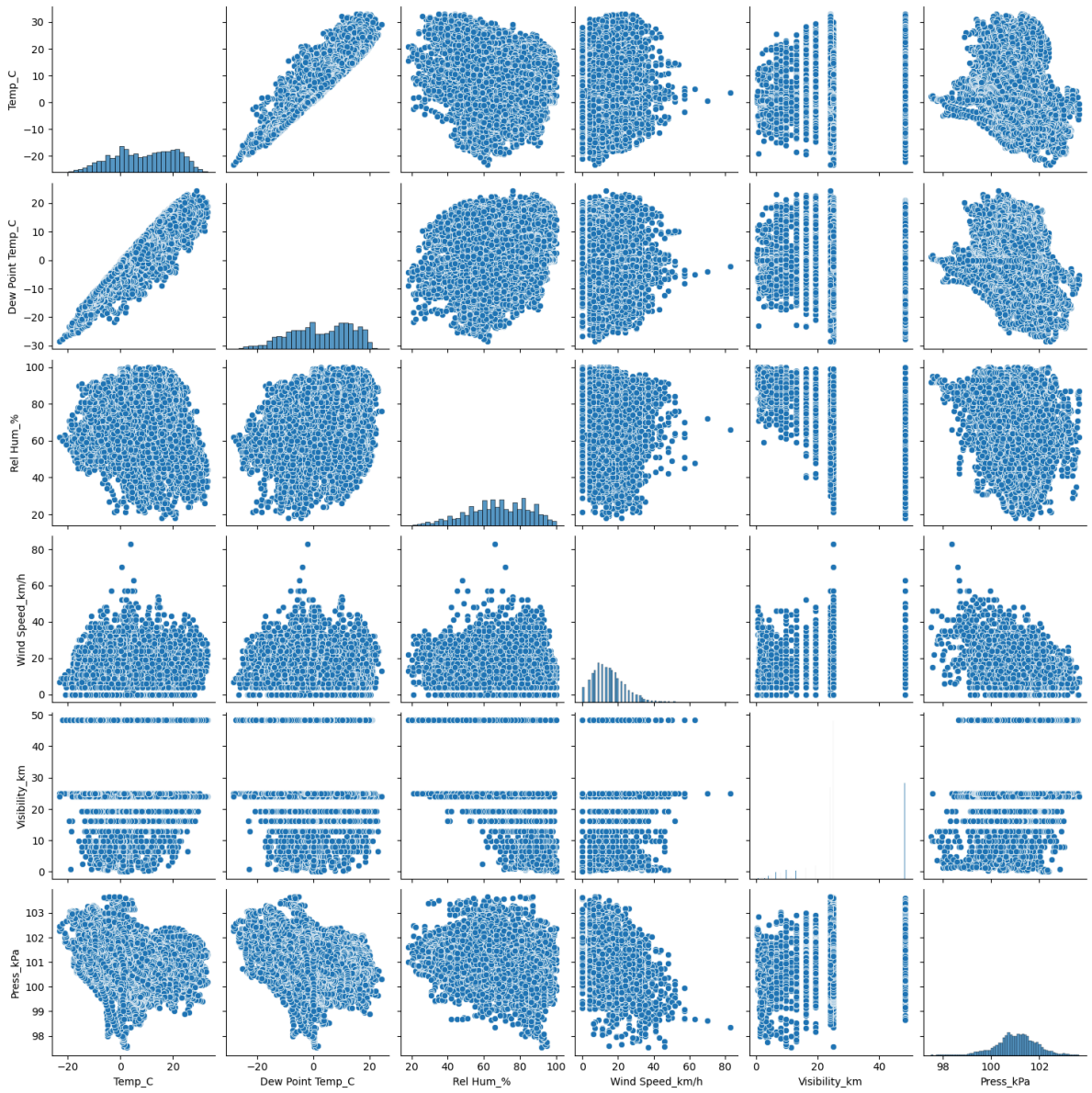


Realtion between Dew point and Pressure

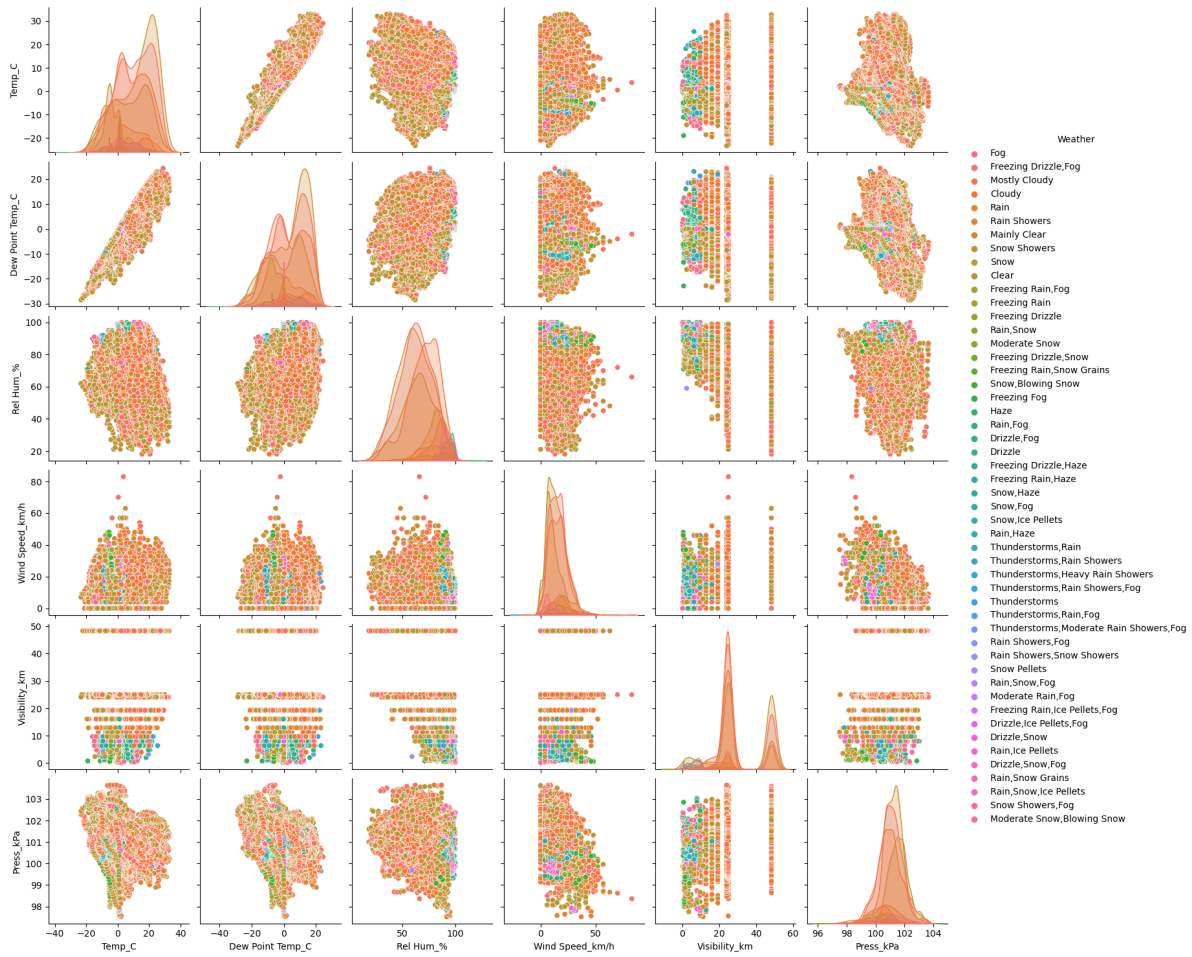
In [77]:
```
sns.scatterplot(data=df,y='Dew Point Temp_C',x='Press_kPa')

plt.xticks(color='k',size=8)
plt.yticks(color='k')

plt.title('Dew vs Pressure',size=20,c='red',fontweight='bold')

plt.xlabel('Age',size=15,fontweight='bold')
plt.ylabel('Charges',size=15,fontweight='bold')

plt.grid()

plt.show()
```



In [81]:
```
sns.pairplot(data=df)

plt.show()
```



In [82]:
```
sns.pairplot(data=df,hue='Weather')

plt.show()
```



observation of Bivariate Analysis

In summary, bivariate analysis of weather data reveals associations between different weather factors: Temperature and Humidity: Higher temperatures often coincide with increased humidity. Wind Speed and Weather Conditions: Temperatures follow seasonal patterns, rising in summer and falling in winter. Correlation Between Weather Conditions: Analysis over time reveals recurring weather cycles or long-term changes. Bivariate analysis highlights relationships between weather variables, aiding in weather prediction and understanding climatic patterns.

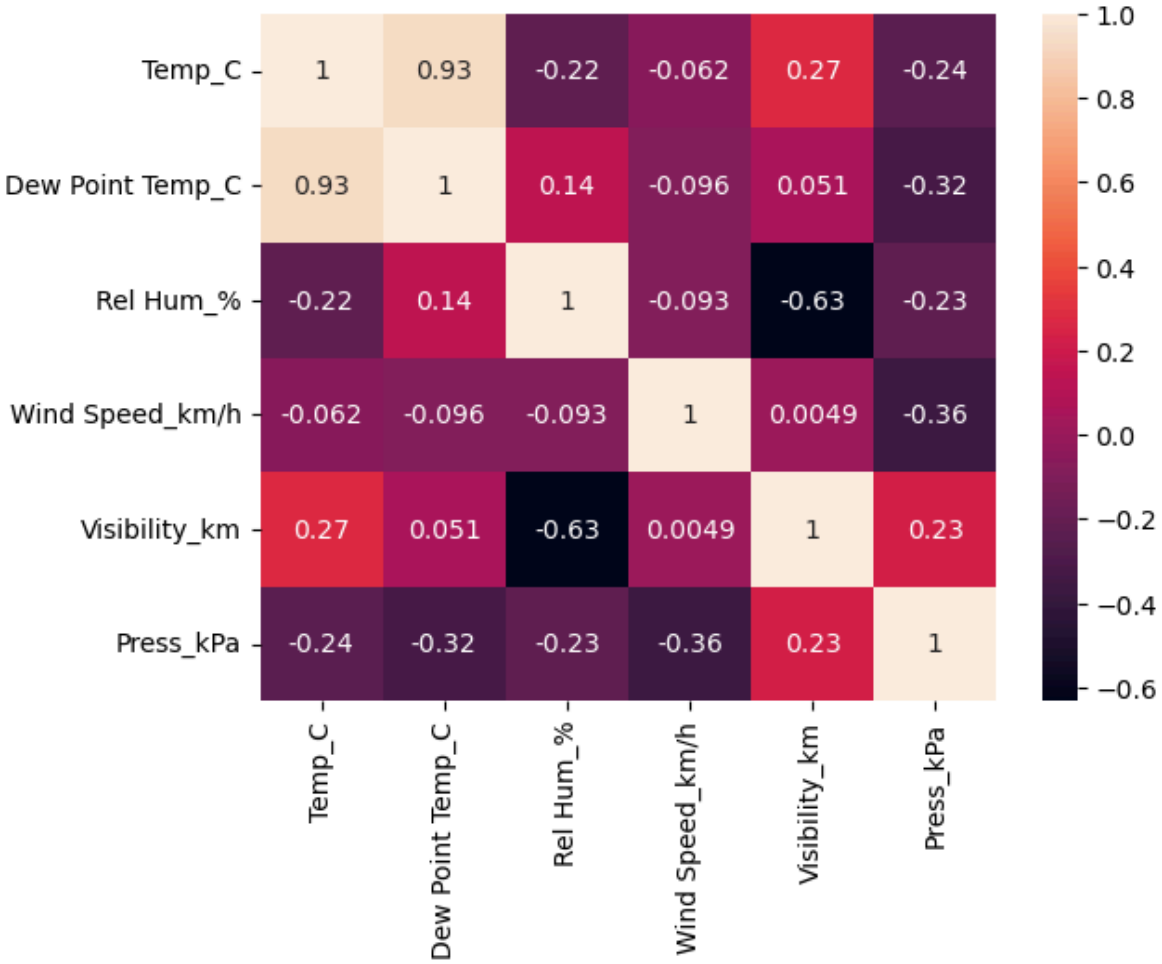
In [4]:
```
df.corr()
```

Out[4]:

	Temp_C	Dew Point Temp_C	Rel Hum_%	Wind Speed_km/h	Visibility_km	Press_kPa
Temp_C	1.000000	0.932714	-0.220182	-0.061876	0.273455	-0.236389
Dew Point Temp_C	0.932714	1.000000	0.139494	-0.095685	0.050813	-0.320616
Rel Hum_%	-0.220182	0.139494	1.000000	-0.092743	-0.633683	-0.231424
Wind Speed_km/h	-0.061876	-0.095685	-0.092743	1.000000	0.004883	-0.356613
Visibility_km	0.273455	0.050813	-0.633683	0.004883	1.000000	0.231847
Press_kPa	-0.236389	-0.320616	-0.231424	-0.356613	0.231847	1.000000

In [5]:
```
sns.heatmap(df.corr(),annot=True)
```

Out[5]: <AxesSubplot:>



CONCLUSION

In this weather analysis project, we embarked on exploring and analyzing weather data using Python. We collected historical weather data from reliable sources, cleaned and preprocessed the data, and performed insightful analysis to derive meaningful conclusions.

Throughout our analysis, we uncovered key trends, patterns, and insights from the data. We visualized temperature variations, precipitation levels, humidity changes, and other relevant factors over time. Descriptive statistics, such as mean temperature, standard deviation, and seasonal variations, provided us with a comprehensive understanding of the weather patterns in our dataset.

Furthermore, we leveraged Python libraries like Pandas, Matplotlib, and NumPy to process, visualize, and interpret the data efficiently. The utilization of these libraries streamlined our analysis and facilitated the creation of informative visualizations, including line plots, histograms, scatter plots, and potentially box plots, to illustrate different aspects of the weather data.

In [ ]: