```
import pandas as pd

df = pd.read_csv('Weather_Data.csv')

df
```

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

8784 rows × 8 columns

```
df.head()
```

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

```
df.shape
```

```
(8784, 8)
```

```
df.index
```

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

```
df.columns
```

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

```
df.dtypes
```

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

```
df['Weather'].unique()
```

```
array(['Fog', 'Freezing Drizzle,Fog', 'Mostly Cloudy', 'Cloudy', 'Rain',
       'Rain Showers', 'Mainly Clear', 'Snow Showers', 'Snow', 'Clear',
       'Freezing Rain,Fog', 'Freezing Rain', 'Freezing Drizzle',
       'Rain,Snow', 'Moderate Snow', 'Freezing Drizzle,Snow',
```

```
'Freezing Rain,Snow Grains', 'Snow,Blowing Snow', 'Freezing Fog',
'Haze', 'Rain,Fog', 'Drizzle,Fog', 'Drizzle',
'Freezing Drizzle,Haze', 'Freezing Rain,Haze', 'Snow,Haze',
'Snow,Fog', 'Snow,Ice Pellets', 'Rain,Haze', 'Thunderstorms,Rain',
'Thunderstorms,Rain Showers', 'Thunderstorms,Heavy Rain Showers',
'Thunderstorms,Rain Showers,Fog', 'Thunderstorms',
'Thunderstorms,Rain,Fog',
'Thunderstorms,Moderate Rain Showers,Fog', 'Rain Showers,Fog',
'Rain Showers,Snow Showers', 'Snow Pellets', 'Rain,Snow,Fog',
'Moderate Rain,Fog', 'Freezing Rain,Ice Pellets,Fog',
'Drizzle,Ice Pellets,Fog', 'Drizzle,Snow', 'Rain,Ice Pellets',
'Drizzle,Snow,Fog', 'Rain,Snow Grains', 'Rain,Snow,Ice Pellets',
'Snow Showers,Fog', 'Moderate Snow,Blowing Snow'], dtype=object)
```

```
df.nunique()
```

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

```
df.count()
```

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

```
df.value_counts()
```

```
Date/Time        Temp_C  Dew Point Temp_C  Rel Hum_%  Wind Speed_km/h
Visibility_km  Press_kPa  Weather
1/1/2012 0:00    -1.8    -3.9              86         4                8.0
101.24     Fog             1
6/1/2012 12:00    19.3    3.3              35         20               48.3
101.32     Cloudy          1
5/9/2012 7:00     14.3    12.5             89         15               4.8
100.12     Fog             1
5/9/2012 8:00     14.3    12.3             88         17               6.4
100.12     Fog             1
5/9/2012 9:00     14.0    12.3             89         9                4.0
100.10     Drizzle,Fog     1

..
```

```
12/8/2012 3:00    2.1    -1.5              77         6                25.0
101.18     Cloudy           1
12/8/2012 2:00    2.0    -1.9              75         7                25.0
101.17     Cloudy           1
12/8/2012 23:00   1.3     0.6              95         17               8.0
100.96     Drizzle,Fog      1
12/8/2012 22:00   1.2     0.6              96         13               6.4
100.84     Fog              1
9/9/2012 9:00     14.8    8.8              67         17               48.3
100.65     Mainly Clear     1
Name: count, Length: 8784, dtype: int64
```

```
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
```

Q.Find all the unique 'Wind speed' values in the data

```
df.head()
```

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

```
df.nunique()
```

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

```
df["Wind Speed_km/h"].nunique()
```

```
34
```

```
df["Wind Speed_km/h"].unique()
```

```
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])
```

Q.Find the number of time when the 'Weather is exactly clear'.

```
df.head(2)
```

	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

```
df.Weather.value_counts()
```

```
Weather
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: count, dtype: int64
```

```
df[df.Weather== 'Clear']
```

	Date/Time	Temp_C	Dew Point Temp_C	Rel Hum_%	Wind Speed_km/h	Visibility_km	Press_kPa	Weat
67	1/3/2012 19:00	-16.9	-24.8	50	24	25.0	101.74	C
114	1/5/2012 18:00	-7.1	-14.4	56	11	25.0	100.71	C
115	1/5/2012 19:00	-9.2	-15.4	61	7	25.0	100.80	C
116	1/5/2012 20:00	-9.8	-15.7	62	9	25.0	100.83	C
117	1/5/2012 21:00	-9.0	-14.8	63	13	25.0	100.83	C
...	...	...	...	...	...	...	...	
8646	12/26/2012 6:00	-13.4	-14.8	89	4	25.0	102.47	C
8698	12/28/2012 10:00	-6.1	-8.6	82	19	24.1	101.27	C
8713	12/29/2012 1:00	-11.9	-13.6	87	11	25.0	101.31	C
8714	12/29/2012 2:00	-11.8	-13.1	90	13	25.0	101.33	C
8756	12/30/2012 20:00	-13.8	-16.5	80	24	25.0	101.52	C

1326 rows × 8 columns

```
df.groupby('Weather').get_group('Clear')
```

	Date/Time	Temp_C	Dew Point Temp_C	Rel Hum_%	Wind Speed_km/h	Visibility_km	Press_kPa	Weat
67	1/3/2012 19:00	-16.9	-24.8	50	24	25.0	101.74	C
114	1/5/2012 18:00	-7.1	-14.4	56	11	25.0	100.71	C
115	1/5/2012 19:00	-9.2	-15.4	61	7	25.0	100.80	C
116	1/5/2012 20:00	-9.8	-15.7	62	9	25.0	100.83	C
117	1/5/2012 21:00	-9.0	-14.8	63	13	25.0	100.83	C
...	...	...	...	...	...	...	...	
8646	12/26/2012 6:00	-13.4	-14.8	89	4	25.0	102.47	C
8698	12/28/2012 10:00	-6.1	-8.6	82	19	24.1	101.27	C
8713	12/29/2012 1:00	-11.9	-13.6	87	11	25.0	101.31	C
8714	12/29/2012 2:00	-11.8	-13.1	90	13	25.0	101.33	C
8756	12/30/2012 20:00	-13.8	-16.5	80	24	25.0	101.52	C

1326 rows × 8 columns

Q.Find the number of time when the 'Weather is exactly 4km/h'.

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

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

474 rows × 8 columns

```
df[df['Wind Speed_km/h']==4].count()
```

```
Date/Time           474
Temp_C              474
Dew Point Temp_C    474
Rel Hum_%           474
Wind Speed_km/h     474
Visibility_km       474
Press_kPa           474
Weather             474
dtype: int64
```

Q.Find out all the null values in the data.

```
df.isnull().sum()
```

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

```
df.notnull().sum()
```

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

Q.Rename the column name 'Weather' of the dataframe to 'Weather conditions'.

```
df.head()
```

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

```
df.rename(columns={'Weather':'Weather Conditions'})
```

	Date/Time	Temp_C	Dew Point Temp_C	Rel Hum_%	Wind Speed_km/h	Visibility_km	Press_kPa	W Cond
0	1/1/2012 0:00	-1.8	-3.9	86	4	8.0	101.24	
1	1/1/2012 1:00	-1.8	-3.7	87	4	8.0	101.24	
2	1/1/2012 2:00	-1.8	-3.4	89	7	4.0	101.26	F Dri
3	1/1/2012 3:00	-1.5	-3.2	88	6	4.0	101.27	F Dri
4	1/1/2012 4:00	-1.5	-3.3	88	7	4.8	101.23	
...	...	...	...	...	...	...	...	
8779	12/31/2012 19:00	0.1	-2.7	81	30	9.7	100.13	