Transformation of Weather Data

February 9, 2024

0.0.1 About Dataset:

0.0.2 Context:

The data contains the weather report and the daily summary of weather

0.0.3 Contents:

The data contains: Date, temperature, Humidity, Windspeed, Visibility, Loud Cover, Daily Summary

0.0.4 Problem Statement:

Transform the given Data.

```
[1]: #Import library:
import pandas as pd
```

<class 'pandas.core.frame.DataFrame'>

Data Description:

```
[3]: #df.head() show the first 5 rows df.head()
```

| [3]: | Formatted Dat | e Summary Precip | Туре | Temperature (C) | \ |
|------|------------------------------|---|----------------|-----------------|---|
| 0 | 2006-04-01 00:00:00.000 +020 | 0 Partly Cloudy | rain | 9.472222 | |
| 1 | 2006-04-01 01:00:00.000 +020 | 0 Partly Cloudy | rain | 9.355556 | |
| 2 | 2006-04-01 02:00:00.000 +020 | 0 Mostly Cloudy | rain | 9.377778 | |
| 3 | 2006-04-01 03:00:00.000 +020 | 0 Partly Cloudy | rain | 8.288889 | |
| 4 | 2006-04-01 04:00:00.000 +020 | O Mostly Cloudy | rain | 8.75556 | |
| | A (a) II | | | | |
| | Apparent Temperature (C) Hu | \mathtt{midity} \mathtt{Wind} \mathtt{Speed} $(\mathtt{km/l}$ | 1) \ | | |
| 0 | 7.388889 | 0.89 14.119 | 97 | | |
| 1 | 7.227778 | 0.86 14.264 | l 6 | | |
| 2 | 9.377778 | 0.89 3.928 | 34 | | |
| 3 | 5.944444 | 0.83 14.103 | 36 | | |

```
Wind Bearing (degrees)
                                 Visibility (km)
                                                   Loud Cover
                                                               Pressure (millibars)
     0
                                                          0.0
                          251.0
                                         15.8263
                                                                             1015.13
     1
                          259.0
                                         15.8263
                                                          0.0
                                                                             1015.63
     2
                                                          0.0
                          204.0
                                         14.9569
                                                                             1015.94
     3
                          269.0
                                                          0.0
                                         15.8263
                                                                             1016.41
     4
                          259.0
                                         15.8263
                                                          0.0
                                                                             1016.51
                             Daily Summary
     O Partly cloudy throughout the day.
     1 Partly cloudy throughout the day.
     2 Partly cloudy throughout the day.
     3 Partly cloudy throughout the day.
     4 Partly cloudy throughout the day.
[4]: #df.head(n) show the first n rows
     df.head(10)
[4]:
                       Formatted Date
                                               Summary Precip Type
                                                                     Temperature (C)
        2006-04-01 00:00:00.000 +0200
                                        Partly Cloudy
                                                              rain
                                                                            9.472222
        2006-04-01 01:00:00.000 +0200
                                        Partly Cloudy
     1
                                                              rain
                                                                            9.355556
        2006-04-01 02:00:00.000 +0200
                                        Mostly Cloudy
                                                              rain
                                                                            9.377778
        2006-04-01 03:00:00.000 +0200
                                        Partly Cloudy
                                                                            8.288889
                                                              rain
     4 2006-04-01 04:00:00.000 +0200
                                        Mostly Cloudy
                                                              rain
                                                                            8.755556
       2006-04-01 05:00:00.000 +0200
                                        Partly Cloudy
                                                              rain
                                                                            9.22222
     6 2006-04-01 06:00:00.000 +0200
                                        Partly Cloudy
                                                              rain
                                                                            7.733333
        2006-04-01 07:00:00.000 +0200
                                        Partly Cloudy
                                                              rain
                                                                            8.772222
     8 2006-04-01 08:00:00.000 +0200
                                        Partly Cloudy
                                                                           10.822222
                                                              rain
        2006-04-01 09:00:00.000 +0200
                                        Partly Cloudy
                                                              rain
                                                                           13.772222
        Apparent Temperature (C)
                                   Humidity
                                             Wind Speed (km/h)
     0
                                       0.89
                         7.388889
                                                        14.1197
     1
                         7,227778
                                       0.86
                                                        14.2646
     2
                         9.377778
                                       0.89
                                                         3.9284
     3
                         5.944444
                                       0.83
                                                        14.1036
     4
                         6.977778
                                       0.83
                                                        11.0446
     5
                         7.111111
                                       0.85
                                                        13.9587
     6
                         5.522222
                                       0.95
                                                        12.3648
     7
                         6.527778
                                       0.89
                                                        14.1519
     8
                        10.822222
                                       0.82
                                                        11.3183
     9
                        13.772222
                                       0.72
                                                        12.5258
        Wind Bearing (degrees)
                                 Visibility (km)
                                                   Loud Cover Pressure (millibars)
     0
                          251.0
                                         15.8263
                                                          0.0
                                                                             1015.13
     1
                          259.0
                                         15.8263
                                                          0.0
                                                                             1015.63
     2
                          204.0
                                         14.9569
                                                          0.0
                                                                             1015.94
```

4

6.977778

0.83

11.0446

```
3
                    269.0
                                                    0.0
                                    15.8263
                                                                       1016.41
4
                    259.0
                                    15.8263
                                                    0.0
                                                                       1016.51
5
                                                    0.0
                    258.0
                                    14.9569
                                                                       1016.66
6
                    259.0
                                     9.9820
                                                    0.0
                                                                       1016.72
7
                    260.0
                                     9.9820
                                                    0.0
                                                                       1016.84
8
                    259.0
                                     9.9820
                                                    0.0
                                                                       1017.37
9
                    279.0
                                                    0.0
                                     9.9820
                                                                       1017.22
                       Daily Summary
O Partly cloudy throughout the day.
1 Partly cloudy throughout the day.
2 Partly cloudy throughout the day.
3 Partly cloudy throughout the day.
4 Partly cloudy throughout the day.
```

6 Partly cloudy throughout the day.
7 Partly cloudy throughout the day.

8 Partly cloudy throughout the day.

5 Partly cloudy throughout the day.

9 Partly cloudy throughout the day.

[5]: #tail() show th last 5 records df.tail()

96449

| [5]: | | Formatted Date Summary Precip Type \ |
|------|-------|---|
| | 96448 | 2016-09-09 19:00:00.000 +0200 Partly Cloudy rain |
| | 96449 | 2016-09-09 20:00:00.000 +0200 Partly Cloudy rain |
| | 96450 | 2016-09-09 21:00:00.000 +0200 Partly Cloudy rain |
| | 96451 | 2016-09-09 22:00:00.000 +0200 Partly Cloudy rain |
| | 96452 | 2016-09-09 23:00:00.000 +0200 Partly Cloudy rain |
| | | Temperature (C) Apparent Temperature (C) Humidity Wind Speed (km/h) \ |
| | 96448 | 26.016667 26.016667 0.43 10.9963 |
| | 96449 | 24.583333 |
| | 96450 | 22.038889 22.038889 0.56 8.9838 |
| | 96451 | 21.522222 |
| | 96452 | 20.438889 20.438889 0.61 5.8765 |
| | | Wind Bearing (degrees) Visibility (km) Loud Cover \ |
| | 96448 | 31.0 16.1000 0.0 |
| | 96449 | 20.0 15.5526 0.0 |
| | 96450 | 30.0 16.1000 0.0 |
| | 96451 | 20.0 16.1000 0.0 |
| | 96452 | 39.0 15.5204 0.0 |
| | | Pressure (millibars) Daily Summary |
| | 96448 | 1014.36 Partly cloudy starting in the morning. |

1015.16 Partly cloudy starting in the morning.

```
96450
                         1015.66 Partly cloudy starting in the morning.
                         1015.95 Partly cloudy starting in the morning.
     96451
     96452
                         1016.16 Partly cloudy starting in the morning.
[6]: #df.tail(n) show the last n no rows
     df.tail(5)
[6]:
                           Formatted Date
                                                 Summary Precip Type \
           2016-09-09 19:00:00.000 +0200
     96448
                                           Partly Cloudy
                                                                rain
     96449 2016-09-09 20:00:00.000 +0200
                                           Partly Cloudy
                                                                rain
     96450 2016-09-09 21:00:00.000 +0200
                                           Partly Cloudy
                                                                rain
     96451 2016-09-09 22:00:00.000 +0200
                                           Partly Cloudy
                                                                rain
     96452 2016-09-09 23:00:00.000 +0200
                                           Partly Cloudy
                                                                rain
            Temperature (C)
                             Apparent Temperature (C) Humidity Wind Speed (km/h) \
     96448
                  26.016667
                                            26.016667
                                                           0.43
                                                                            10.9963
                  24.583333
                                                           0.48
     96449
                                            24.583333
                                                                            10.0947
                                                           0.56
     96450
                  22.038889
                                            22.038889
                                                                            8.9838
     96451
                  21.522222
                                            21.522222
                                                           0.60
                                                                            10.5294
     96452
                  20.438889
                                            20.438889
                                                           0.61
                                                                            5.8765
            Wind Bearing (degrees) Visibility (km) Loud Cover
     96448
                              31.0
                                            16.1000
                                                            0.0
     96449
                              20.0
                                            15.5526
                                                            0.0
                              30.0
                                                            0.0
     96450
                                            16.1000
     96451
                              20.0
                                            16.1000
                                                            0.0
     96452
                              39.0
                                            15.5204
                                                            0.0
           Pressure (millibars)
                                                           Daily Summary
                         1014.36 Partly cloudy starting in the morning.
    96448
     96449
                         1015.16 Partly cloudy starting in the morning.
     96450
                         1015.66 Partly cloudy starting in the morning.
                         1015.95 Partly cloudy starting in the morning.
     96451
     96452
                         1016.16 Partly cloudy starting in the morning.
[7]: # No of rows and cols:
     print("No of rows and cols :",df.shape)
    No of rows and cols : (96453, 12)
[8]: # No of rows:
     print("No of rows :",df.shape[0])
     print("No of rows :",len(df))
    No of rows : 96453
```

No of rows : 96453

```
[9]: # No of cols
      print("No of cols :",df.shape[1])
      print("No of cols :",len(df.columns))
     No of cols : 12
     No of cols : 12
[10]: # List of column name
      df.columns
[10]: Index(['Formatted Date', 'Summary', 'Precip Type', 'Temperature (C)',
             'Apparent Temperature (C)', 'Humidity', 'Wind Speed (km/h)',
             'Wind Bearing (degrees)', 'Visibility (km)', 'Loud Cover',
             'Pressure (millibars)', 'Daily Summary'],
            dtype='object')
[11]: # Show data type of each columns
      df.dtypes
[11]: Formatted Date
                                   object
      Summary
                                   object
     Precip Type
                                   object
      Temperature (C)
                                  float64
      Apparent Temperature (C)
                                  float64
     Humidity
                                  float64
     Wind Speed (km/h)
                                  float64
      Wind Bearing (degrees)
                                  float64
      Visibility (km)
                                  float64
     Loud Cover
                                  float64
      Pressure (millibars)
                                  float64
     Daily Summary
                                   object
      dtype: object
[12]: # Get infformation of the dataframe
      df.info()
     <class 'pandas.core.frame.DataFrame'>
     RangeIndex: 96453 entries, 0 to 96452
     Data columns (total 12 columns):
      #
          Column
                                    Non-Null Count Dtype
         _____
          Formatted Date
                                    96453 non-null object
      0
          Summary
      1
                                    96453 non-null object
      2
          Precip Type
                                    95936 non-null object
      3
          Temperature (C)
                                    96453 non-null float64
      4
          Apparent Temperature (C) 96453 non-null float64
      5
          Humidity
                                    96453 non-null float64
          Wind Speed (km/h)
                                    96453 non-null float64
          Wind Bearing (degrees)
                                    96453 non-null float64
```

```
8
          Visibility (km)
                                      96453 non-null float64
      9
          Loud Cover
                                      96453 non-null
                                                      float64
         Pressure (millibars)
      10
                                      96453 non-null
                                                       float64
      11 Daily Summary
                                      96453 non-null
                                                       object
     dtypes: float64(8), object(4)
     memory usage: 8.8+ MB
[13]: # Statiscal information of numeric columns
      df.describe()
             Temperature (C)
                               Apparent Temperature (C)
                                                               Humidity
                 96453.000000
                                            96453.000000
                                                           96453.000000
      count
      mean
                    11.932678
                                               10.855029
                                                               0.734899
      std
                     9.551546
                                               10.696847
                                                               0.195473
      min
                   -21.822222
                                              -27.716667
                                                               0.00000
      25%
                     4.688889
                                                2.311111
                                                               0.600000
      50%
                    12.000000
                                               12.000000
                                                               0.780000
      75%
                    18.838889
                                               18.838889
                                                               0.890000
      max
                   39.905556
                                               39.344444
                                                               1.000000
             Wind Speed (km/h)
                                 Wind Bearing (degrees)
                                                           Visibility (km)
                                                                             Loud Cover
                   96453.000000
                                            96453.000000
                                                              96453.000000
                                                                                96453.0
      count
      mean
                      10.810640
                                              187.509232
                                                                 10.347325
                                                                                    0.0
                                              107.383428
                                                                                    0.0
      std
                       6.913571
                                                                  4.192123
      min
                       0.000000
                                                0.000000
                                                                  0.00000
                                                                                    0.0
      25%
                       5.828200
                                              116.000000
                                                                  8.339800
                                                                                    0.0
      50%
                       9.965900
                                              180.000000
                                                                 10.046400
                                                                                    0.0
      75%
                      14.135800
                                              290.000000
                                                                 14.812000
                                                                                    0.0
                      63.852600
                                              359.000000
                                                                 16.100000
                                                                                    0.0
      max
             Pressure (millibars)
      count
                      96453.000000
      mean
                       1003.235956
      std
                        116.969906
      min
                          0.000000
      25%
                       1011.900000
      50%
                       1016.450000
      75%
                       1021.090000
      max
                       1046.380000
[14]: # Statical information of the data type object
      df.describe(include='object')
                                                     Summary Precip Type
                              Formatted Date
                                                                    95936
      count
                                        96453
                                                        96453
      unique
                                        96429
                                                           27
                                                                         2
      top
              2010-08-02 00:00:00.000 +0200
                                               Partly Cloudy
                                                                     rain
```

[13]:

[14]:

freq

31733

85224

```
Daily Summary
      count
                                          96453
      unique
              Mostly cloudy throughout the day.
      top
                                          20085
      freq
[15]: # Get unique columns
      df['Precip Type'].unique()
[15]: array(['rain', 'snow', nan], dtype=object)
[16]: df['Summary'].unique()
[16]: array(['Partly Cloudy', 'Mostly Cloudy', 'Overcast', 'Foggy',
             'Breezy and Mostly Cloudy', 'Clear', 'Breezy and Partly Cloudy',
             'Breezy and Overcast', 'Humid and Mostly Cloudy',
             'Humid and Partly Cloudy', 'Windy and Foggy', 'Windy and Overcast',
             'Breezy and Foggy', 'Windy and Partly Cloudy', 'Breezy',
             'Dry and Partly Cloudy', 'Windy and Mostly Cloudy',
             'Dangerously Windy and Partly Cloudy', 'Dry', 'Windy',
             'Humid and Overcast', 'Light Rain', 'Drizzle', 'Windy and Dry',
             'Dry and Mostly Cloudy', 'Breezy and Dry', 'Rain'], dtype=object)
[17]: df['Daily Summary'].unique()
[17]: array(['Partly cloudy throughout the day.',
             'Mostly cloudy throughout the day.', 'Foggy in the evening.',
             'Foggy overnight and breezy in the morning.',
             'Overcast throughout the day.', 'Partly cloudy until night.',
             'Mostly cloudy until night.',
             'Foggy starting overnight continuing until morning.',
             'Foggy in the morning.', 'Partly cloudy until evening.',
             'Partly cloudy starting in the morning.',
             'Mostly cloudy starting overnight continuing until night.',
             'Mostly cloudy until evening.',
             'Partly cloudy starting in the morning continuing until evening.',
             'Partly cloudy starting in the afternoon.',
             'Partly cloudy starting overnight.',
             'Partly cloudy until morning.',
             'Partly cloudy starting overnight continuing until night.',
             'Partly cloudy starting in the afternoon continuing until night.',
             'Mostly cloudy starting overnight.',
             'Partly cloudy until afternoon.',
             'Mostly cloudy until night and breezy in the afternoon.',
             'Foggy starting in the evening.', 'Foggy throughout the day.',
             'Foggy starting in the evening continuing until night.',
```

```
'Mostly cloudy until morning.',
       'Foggy starting in the morning continuing until evening.',
       'Foggy starting overnight continuing until afternoon.',
       'Partly cloudy starting in the morning continuing until afternoon.',
       'Foggy starting overnight.', 'Foggy until morning.',
       'Foggy starting overnight continuing until evening.',
       'Foggy starting in the afternoon.',
       'Partly cloudy starting overnight continuing until afternoon.',
       'Partly cloudy starting in the morning continuing until night.',
       'Overcast until night.',
       'Mostly cloudy starting overnight continuing until evening.',
       'Foggy overnight.', 'Partly cloudy in the morning.',
       'Mostly cloudy starting in the morning.',
       'Foggy starting in the afternoon continuing until evening.',
       'Mostly cloudy until afternoon.',
       'Foggy starting overnight continuing until night.',
       'Mostly cloudy throughout the day and breezy in the evening.',
       'Foggy starting in the morning continuing until afternoon.',
       'Partly cloudy in the afternoon.', 'Clear throughout the day.',
       'Partly cloudy starting in the afternoon continuing until evening.',
       'Partly cloudy overnight.', 'Overcast until evening.',
       'Foggy in the morning and breezy starting in the afternoon continuing
until night.',
       'Breezy starting overnight continuing until afternoon and foggy starting
in the morning continuing until evening.',
       'Partly cloudy starting overnight continuing until morning.',
       'Mostly cloudy throughout the day and breezy in the afternoon.',
       'Mostly cloudy starting overnight and breezy in the afternoon.',
       'Partly cloudy throughout the day and breezy starting in the morning
continuing until night.',
       'Mostly cloudy throughout the day and breezy in the morning.',
       'Partly cloudy starting in the evening continuing until night.',
       'Mostly cloudy until night and breezy starting in the morning continuing
until afternoon.',
       'Partly cloudy starting in the morning continuing until evening and
breezy starting in the morning continuing until afternoon.',
       'Partly cloudy throughout the day and breezy starting in the morning
continuing until afternoon.',
       'Partly cloudy throughout the day and breezy starting in the morning
continuing until evening.',
       'Foggy until afternoon.',
       'Overcast until night and breezy overnight.',
       'Breezy until morning and mostly cloudy throughout the day.',
       'Mostly cloudy starting in the morning continuing until night.',
       'Breezy starting overnight continuing until morning and partly cloudy
starting overnight continuing until evening.',
       'Partly cloudy in the evening.',
```

```
'Mostly cloudy starting overnight continuing until afternoon.',
```

'Mostly cloudy starting in the morning continuing until evening.',

'Partly cloudy starting overnight continuing until afternoon and breezy in the afternoon.', $\$

'Partly cloudy starting overnight and breezy in the afternoon.',

'Mostly cloudy starting in the morning and breezy in the evening.',

'Foggy starting in the afternoon continuing until night.',

'Foggy until night.',

'Foggy starting in the morning continuing until night.',

'Foggy until evening.', 'Foggy starting in the morning.',

'Partly cloudy starting overnight continuing until evening.',

'Partly cloudy starting overnight continuing until evening and breezy starting in the morning continuing until evening.',

'Breezy starting overnight continuing until morning and foggy in the evening.',

'Mostly cloudy throughout the day and breezy starting in the morning continuing until evening.',

'Partly cloudy until evening and breezy starting in the morning continuing until afternoon.',

'Mostly cloudy starting in the afternoon continuing until night.',

'Breezy starting overnight continuing until afternoon and mostly cloudy starting overnight continuing until evening.',

'Mostly cloudy throughout the day and windy starting in the morning continuing until evening.',

'Breezy and partly cloudy in the afternoon.',

'Mostly cloudy starting overnight and breezy starting in the morning continuing until afternoon.',

'Partly cloudy until night and breezy starting in the morning continuing until afternoon.',

'Breezy and mostly cloudy overnight.',

'Mostly cloudy throughout the day and breezy overnight.',

'Mostly cloudy throughout the day and breezy starting in the morning continuing until afternoon.',

'Partly cloudy throughout the day and breezy in the morning.',

'Partly cloudy starting in the morning continuing until evening and breezy starting in the afternoon continuing until evening.',

'Mostly cloudy starting overnight and breezy in the morning.',

'Partly cloudy starting in the afternoon and breezy in the afternoon.',

'Partly cloudy starting in the morning and breezy in the evening.',

'Partly cloudy until evening and breezy in the morning.',

'Partly cloudy starting overnight continuing until evening and breezy starting in the morning continuing until afternoon.',

'Partly cloudy starting overnight continuing until evening and breezy in

^{&#}x27;Mostly cloudy starting in the morning continuing until afternoon.',

^{&#}x27;Mostly cloudy starting in the afternoon.',

the evening.',

'Mostly cloudy throughout the day and breezy starting in the evening.',

'Mostly cloudy throughout the day and windy starting in the morning continuing until night.',

'Breezy starting overnight continuing until morning and partly cloudy starting in the morning.',

'Mostly cloudy starting in the morning and breezy overnight.',

'Partly cloudy throughout the day and breezy in the evening.',

'Mostly cloudy until night and breezy in the evening.',

'Partly cloudy starting in the evening.',

'Overcast starting in the morning.',

'Mostly cloudy starting overnight continuing until evening and breezy starting overnight continuing until morning.',

'Partly cloudy starting overnight continuing until morning and breezy starting in the morning continuing until afternoon.',

'Partly cloudy until evening and breezy starting in the morning continuing until evening.',

'Breezy starting in the morning continuing until afternoon and partly cloudy starting in the morning.',

'Partly cloudy starting in the morning and breezy starting in the afternoon continuing until evening.',

'Mostly cloudy starting overnight continuing until morning.',

'Mostly cloudy throughout the day and breezy starting overnight continuing until afternoon.',

'Breezy starting overnight continuing until morning and foggy overnight.',

'Mostly cloudy throughout the day and breezy starting overnight continuing until morning.',

'Overcast throughout the day and breezy in the morning.',

'Overcast throughout the day and breezy in the evening.',

'Mostly cloudy starting in the morning continuing until night and breezy in the afternoon.', $\,$

'Mostly cloudy until night and breezy starting in the evening continuing until night.', $\,$

'Partly cloudy until night and breezy in the morning.',

'Partly cloudy until evening and breezy overnight.',

'Partly cloudy starting overnight continuing until night and windy starting in the morning continuing until afternoon.',

'Breezy starting in the morning continuing until afternoon and mostly cloudy starting in the morning.',

'Foggy starting overnight continuing until morning and breezy starting in the evening.',

'Mostly cloudy until night and breezy starting in the afternoon.',

'Foggy in the afternoon.',

'Mostly cloudy until night and breezy starting in the afternoon continuing until night.',

'Foggy starting overnight continuing until morning and breezy starting in the evening continuing until night.',

'Breezy until afternoon and mostly cloudy throughout the day.',

'Mostly cloudy throughout the day and breezy starting in the morning continuing until night.', $\,$

'Partly cloudy starting overnight continuing until evening and breezy in the morning.',

'Mostly cloudy starting in the morning and breezy in the afternoon.',

'Foggy starting overnight continuing until morning and breezy starting in the morning continuing until afternoon.',

'Mostly cloudy until evening and windy starting in the morning continuing until afternoon.',

'Foggy starting overnight continuing until afternoon and breezy in the morning.', $\$

'Foggy starting in the morning continuing until afternoon and breezy starting in the evening.',

'Foggy starting overnight continuing until morning and breezy in the afternoon.', $% \left(1\right) =\left(1\right) \left(1\right)$

'Partly cloudy starting in the morning continuing until evening and breezy in the afternoon.',

'Partly cloudy starting in the morning continuing until night and breezy starting in the afternoon continuing until evening.',

'Mostly cloudy until night and breezy starting in the evening.',

'Breezy in the morning and mostly cloudy starting in the morning.',

'Mostly cloudy until night and breezy starting in the morning continuing until evening.',

'Partly cloudy starting overnight continuing until evening and windy starting in the morning continuing until evening.',

'Breezy in the morning and partly cloudy starting in the evening continuing until night.',

'Partly cloudy overnight and breezy starting in the morning continuing until afternoon.',

'Light rain in the morning.', 'Light rain until morning.',

'Light rain in the morning and afternoon.',

'Partly cloudy starting in the morning continuing until night and breezy starting in the morning continuing until afternoon.',

'Breezy starting in the afternoon continuing until night and mostly cloudy starting in the evening.',

'Mostly cloudy throughout the day and breezy starting in the evening continuing until night.',

'Foggy starting in the afternoon and breezy starting in the afternoon continuing until evening.',

'Breezy and foggy until morning.',

'Mostly cloudy until night and breezy starting overnight continuing until morning.',

'Partly cloudy starting overnight continuing until night and breezy in the morning.',

'Partly cloudy starting overnight continuing until night and breezy in the afternoon.',

'Mostly cloudy starting in the morning and breezy starting in the afternoon continuing until evening.',

'Partly cloudy starting overnight and breezy starting in the evening.',

'Breezy overnight and overcast throughout the day.',

'Partly cloudy until night and breezy in the afternoon.',

'Mostly cloudy starting overnight and breezy starting in the evening.',

'Breezy overnight and partly cloudy until evening.',

'Mostly cloudy starting in the evening.',

'Mostly cloudy throughout the day and breezy starting in the afternoon.',

'Mostly cloudy throughout the day and breezy starting in the afternoon continuing until evening.',

'Mostly cloudy until night and windy starting in the morning continuing until afternoon.', $\$

'Breezy and foggy starting in the evening.',

'Breezy overnight and partly cloudy throughout the day.',

'Overcast throughout the day and breezy starting in the evening.',

'Breezy until evening and foggy in the morning.',

'Breezy overnight and mostly cloudy throughout the day.',

'Partly cloudy until evening and breezy in the afternoon.',

'Partly cloudy starting in the morning and breezy starting in the morning continuing until afternoon.',

'Mostly cloudy until evening and breezy in the evening.',

'Windy in the afternoon.', 'Overcast until morning.',

'Mostly cloudy overnight.',

'Foggy starting in the morning continuing until evening and breezy in the evening.',

'Breezy starting overnight continuing until morning.',

'Breezy starting in the afternoon continuing until evening and foggy starting in the evening.',

'Mostly cloudy until night and breezy overnight.',

'Mostly cloudy starting in the morning and windy in the evening.',

'Partly cloudy throughout the day and windy starting in the morning continuing until afternoon.',

'Breezy until afternoon and overcast throughout the day.',

```
'Breezy starting in the afternoon continuing until evening and foggy in
     the evening.',
             'Breezy starting in the morning continuing until night.',
             'Breezy in the morning and mostly cloudy starting in the evening.',
             'Mostly cloudy until evening and breezy in the afternoon.',
             'Mostly cloudy until night and breezy starting in the afternoon
     continuing until evening.',
             'Mostly cloudy until evening and breezy starting overnight continuing
     until morning.',
             'Overcast throughout the day and breezy in the afternoon.',
             'Overcast throughout the day and breezy starting in the morning
     continuing until evening.',
             'Overcast throughout the day and breezy overnight.',
             'Overcast starting in the afternoon.',
             'Partly cloudy throughout the day and breezy in the afternoon.',
             'Light rain starting overnight.',
             'Drizzle starting in the evening.', 'Drizzle until morning.',
             'Rain throughout the day.', 'Rain until morning.',
             'Light rain overnight.', 'Rain until afternoon.'], dtype=object)
[18]: # Show values of the Columns Specified
     df[['Formatted Date', 'Summary', 'Precip Type',
                                                            'Temperature (C)',⊔
       「18]:
                           Formatted Date
                                                 Summary Precip Type \
     0
            2006-04-01 00:00:00.000 +0200 Partly Cloudy
                                                                rain
     1
             2006-04-01 01:00:00.000 +0200
                                           Partly Cloudy
                                                                rain
     2
            2006-04-01 02:00:00.000 +0200
                                           Mostly Cloudy
                                                                rain
     3
             2006-04-01 03:00:00.000 +0200
                                           Partly Cloudy
                                                                rain
     4
            2006-04-01 04:00:00.000 +0200
                                           Mostly Cloudy
                                                                rain
     96448 2016-09-09 19:00:00.000 +0200
                                           Partly Cloudy
                                                                rain
     96449 2016-09-09 20:00:00.000 +0200
                                           Partly Cloudy
                                                                rain
     96450 2016-09-09 21:00:00.000 +0200
                                           Partly Cloudy
                                                                rain
     96451 2016-09-09 22:00:00.000 +0200
                                           Partly Cloudy
                                                                rain
     96452 2016-09-09 23:00:00.000 +0200
                                           Partly Cloudy
                                                                rain
            Temperature (C)
                             Humidity Wind Speed (km/h)
     0
                   9.472222
                                 0.89
                                                 14.1197
     1
                   9.355556
                                 0.86
                                                 14.2646
     2
                   9.377778
                                 0.89
                                                  3.9284
     3
                   8.288889
                                 0.83
                                                 14.1036
     4
                   8.755556
                                 0.83
                                                 11.0446
                  26.016667
                                 0.43
                                                 10.9963
     96448
                                 0.48
                                                 10.0947
     96449
                  24.583333
```

'Breezy in the morning and foggy in the evening.',

```
      96450
      22.038889
      0.56
      8.9838

      96451
      21.522222
      0.60
      10.5294

      96452
      20.438889
      0.61
      5.8765
```

[96453 rows x 6 columns]

Slicing:

[19]: #first value of the first row df.loc[0]

[19]: Formatted Date 2006-04-01 00:00:00.000 +0200 Summary Partly Cloudy Precip Type rain Temperature (C) 9.472222 Apparent Temperature (C) 7.388889 Humidity 0.89 Wind Speed (km/h) 14.1197 Wind Bearing (degrees) 251.0 Visibility (km) 15.8263 Loud Cover 0.0 Pressure (millibars) 1015.13 Daily Summary Partly cloudy throughout the day.

Name: 0, dtype: object

[20]: #show the values rom rows 10 to 20 df.loc[10:20]

| [00] | | а ъ . ш | m . (a) \ |
|-------|-------------------------------|---------------------------|-----------|
| [20]: | Formatted Date | J 1 J1 | - |
| 10 | 2006-04-01 10:00:00.000 +0200 | Partly Cloudy rain | 16.016667 |
| 11 | 2006-04-01 11:00:00.000 +0200 | Partly Cloudy rain | 17.144444 |
| 12 | 2006-04-01 12:00:00.000 +0200 | Partly Cloudy rain | 17.800000 |
| 13 | 2006-04-01 13:00:00.000 +0200 | Partly Cloudy rain | 17.333333 |
| 14 | 2006-04-01 14:00:00.000 +0200 | Partly Cloudy rain | 18.877778 |
| 15 | 2006-04-01 15:00:00.000 +0200 | Partly Cloudy rain | 18.911111 |
| 16 | 2006-04-01 16:00:00.000 +0200 | Partly Cloudy rain | 15.388889 |
| 17 | 2006-04-01 17:00:00.000 +0200 | Mostly Cloudy rain | 15.550000 |
| 18 | 2006-04-01 18:00:00.000 +0200 | Mostly Cloudy rain | 14.255556 |
| 19 | 2006-04-01 19:00:00.000 +0200 | Mostly Cloudy rain | 13.144444 |
| 20 | 2006-04-01 20:00:00.000 +0200 | Mostly Cloudy rain | 11.550000 |
| | Apparent Temperature (C) Hum | idity Wind Speed (km/h) \ | |
| 10 | 16.016667 | 0.67 17.5651 | |
| 11 | 17.144444 | 0.54 19.7869 | |
| 12 | 17.800000 | 0.55 21.9443 | |
| 13 | 17.333333 | 0.51 20.6885 | |
| 14 | 18.877778 | 0.47 15.3755 | |
| 15 | 18.911111 | 0.46 10.4006 | |

```
0.60
      16
                         15.388889
                                                          14.4095
      17
                                         0.63
                         15.550000
                                                          11.1573
      18
                         14.255556
                                         0.69
                                                           8.5169
      19
                         13.144444
                                         0.70
                                                           7.6314
      20
                         11.550000
                                         0.77
                                                           7.3899
          Wind Bearing (degrees)
                                   Visibility (km)
                                                    Loud Cover Pressure (millibars) \
      10
                            290.0
                                           11.2056
                                                            0.0
                                                                               1017.42
      11
                            316.0
                                           11.4471
                                                            0.0
                                                                               1017.74
      12
                            281.0
                                           11.2700
                                                            0.0
                                                                               1017.59
      13
                            289.0
                                           11.2700
                                                            0.0
                                                                               1017.48
      14
                            262.0
                                           11.4471
                                                            0.0
                                                                              1017.17
      15
                            288.0
                                           11.2700
                                                            0.0
                                                                              1016.47
      16
                            251.0
                                           11.2700
                                                            0.0
                                                                               1016.15
      17
                            230.0
                                                            0.0
                                           11.4471
                                                                              1016.17
      18
                            163.0
                                           11.2056
                                                            0.0
                                                                               1015.82
      19
                            139.0
                                           11.2056
                                                            0.0
                                                                               1015.83
      20
                            147.0
                                           11.0285
                                                            0.0
                                                                               1015.85
                               Daily Summary
         Partly cloudy throughout the day.
      11 Partly cloudy throughout the day.
      12 Partly cloudy throughout the day.
      13 Partly cloudy throughout the day.
      14 Partly cloudy throughout the day.
      15 Partly cloudy throughout the day.
      16 Partly cloudy throughout the day.
      17 Partly cloudy throughout the day.
      18 Partly cloudy throughout the day.
      19 Partly cloudy throughout the day.
      20 Partly cloudy throughout the day.
[21]: #show all rows and the first 4 columns o to 3
      df.iloc[:,0:4]
[21]:
                             Formatted Date
                                                   Summary Precip Type
      0
             2006-04-01 00:00:00.000 +0200
                                             Partly Cloudy
                                                                   rain
             2006-04-01 01:00:00.000 +0200
                                             Partly Cloudy
      1
                                                                   rain
      2
             2006-04-01 02:00:00.000 +0200
                                             Mostly Cloudy
                                                                   rain
             2006-04-01 03:00:00.000 +0200
      3
                                             Partly Cloudy
                                                                   rain
      4
             2006-04-01 04:00:00.000 +0200
                                             Mostly Cloudy
                                                                   rain
             2016-09-09 19:00:00.000 +0200
                                             Partly Cloudy
      96448
                                                                   rain
      96449
             2016-09-09 20:00:00.000 +0200
                                             Partly Cloudy
                                                                   rain
      96450
             2016-09-09 21:00:00.000 +0200
                                             Partly Cloudy
                                                                   rain
      96451
             2016-09-09 22:00:00.000 +0200
                                             Partly Cloudy
                                                                   rain
             2016-09-09 23:00:00.000 +0200
                                             Partly Cloudy
      96452
                                                                   rain
```

```
Temperature (C)
              9.472222
0
              9.355556
1
2
              9.377778
3
              8.288889
4
              8.755556
96448
             26.016667
96449
             24.583333
96450
             22.038889
96451
             21.522222
96452
             20.438889
[96453 rows x 4 columns]
```

[22]: #show the values from rows 10 to 19 and all the columns df.iloc[10:20,:]

| | Formatted Da | te Summary P | recip Type Temm | perature (C) \ |
|----|--|---|---|---|
| 10 | 2006-04-01 10:00:00.000 +02 | · | | 16.016667 |
| 11 | 2006-04-01 11:00:00.000 +02 | v | rain | 17.144444 |
| 12 | | <i>y</i> | | 17.800000 |
| 13 | | <i>y</i> | | 17.333333 |
| | | <i>y</i> | | 18.877778 |
| | | <i>J</i> | | 18.911111 |
| | | <i>y</i> | | 15.388889 |
| | | <i>J</i> | | 15.550000 |
| | | J | | 14.255556 |
| | | <i>y</i> | | 13.144444 |
| | | J J | | |
| | Apparent Temperature (C) H | umidity Wind Speed | (km/h) \ | |
| 10 | 16.016667 | 0.67 | 17.5651 | |
| 11 | 17.144444 | 0.54 | 19.7869 | |
| 12 | 17.800000 | 0.55 | 21.9443 | |
| 13 | 17.333333 | 0.51 | 20.6885 | |
| 14 | 18.877778 | 0.47 | 15.3755 | |
| 15 | 18.911111 | 0.46 | 10.4006 | |
| 16 | 15.388889 | 0.60 | 14.4095 | |
| 17 | 15.550000 | 0.63 | 11.1573 | |
| 18 | 14.255556 | 0.69 | 8.5169 | |
| 19 | 13.144444 | 0.70 | 7.6314 | |
| | | | | |
| | Wind Bearing (degrees) Vis | ibility (km) Loud | Cover Pressure | <pre>(millibars) \</pre> |
| 10 | 290.0 | 11.2056 | 0.0 | 1017.42 |
| 11 | 316.0 | 11.4471 | 0.0 | 1017.74 |
| 12 | 281.0 | 11.2700 | 0.0 | 1017.59 |
| | 11 12 13 14 15 16 17 18 19 10 11 12 13 14 15 16 17 18 19 | 10 2006-04-01 10:00:00.000 +020 11 2006-04-01 11:00:00.000 +020 12 2006-04-01 12:00:00.000 +020 13 2006-04-01 13:00:00.000 +020 14 2006-04-01 14:00:00.000 +020 15 2006-04-01 15:00:00.000 +020 16 2006-04-01 16:00:00.000 +020 17 2006-04-01 17:00:00.000 +020 18 2006-04-01 18:00:00.000 +020 19 2006-04-01 19:00:00.000 +020 19 2006-04-01 19:00:00.000 +020 11 1 17.144444 12 17.800000 13 17.333333 14 18.877778 15 18.911111 16 15.388889 17 15.550000 18 14.255556 19 13.144444 Wind Bearing (degrees) Vision 10 290.0 11 316.0 | 10 2006-04-01 10:00:00.000 +0200 Partly Cloudy 11 2006-04-01 11:00:00.000 +0200 Partly Cloudy 12 2006-04-01 12:00:00.000 +0200 Partly Cloudy 13 2006-04-01 13:00:00.000 +0200 Partly Cloudy 14 2006-04-01 14:00:00.000 +0200 Partly Cloudy 15 2006-04-01 15:00:00.000 +0200 Partly Cloudy 16 2006-04-01 16:00:00.000 +0200 Partly Cloudy 17 2006-04-01 17:00:00.000 +0200 Mostly Cloudy 18 2006-04-01 18:00:00.000 +0200 Mostly Cloudy 19 2006-04-01 19:00:00.000 +0200 Mostly Cloudy 19 2006-04-01 19:00:00.000 +0200 Mostly Cloudy 10 16.016667 0.67 11 17.144444 0.54 12 17.800000 0.55 13 17.333333 0.51 14 18.877778 0.47 15 18.911111 0.46 16 15.388889 0.60 17 15.550000 0.63 18 14.255556 0.69 19 13.144444 0.70 Wind Bearing (degrees) Visibility (km) Loud 10 290.0 11.2056 11 316.0 11.4471 | 10 2006-04-01 10:00:00.000 +0200 Partly Cloudy rain 11 2006-04-01 11:00:00.000 +0200 Partly Cloudy rain 12 2006-04-01 12:00:00.000 +0200 Partly Cloudy rain 13 2006-04-01 13:00:00.000 +0200 Partly Cloudy rain 14 2006-04-01 14:00:00.000 +0200 Partly Cloudy rain 15 2006-04-01 15:00:00.000 +0200 Partly Cloudy rain 16 2006-04-01 15:00:00.000 +0200 Partly Cloudy rain 17 2006-04-01 16:00:00.000 +0200 Partly Cloudy rain 18 2006-04-01 17:00:00.000 +0200 Mostly Cloudy rain 19 2006-04-01 18:00:00.000 +0200 Mostly Cloudy rain 19 2006-04-01 19:00:00.000 +0200 Mostly Cloudy rain 10 10 16.016667 0.67 17.5651 11 17.144444 0.54 19.7869 12 17.80000 0.55 21.9443 13 17.333333 0.51 20.6885 14 18.877778 0.47 15.3755 15 18.911111 0.46 10.4006 16 15.388889 0.60 14.4095 17 15.550000 0.63 11.1573 18 14.255556 0.69 8.5169 19 13.144444 0.70 7.6314 Wind Bearing (degrees) Visibility (km) Loud Cover Pressure 10 290.0 11.2056 0.0 11 316.0 11.4471 0.0 |

```
13
                      289.0
                                     11.2700
                                                      0.0
                                                                         1017.48
14
                      262.0
                                     11.4471
                                                      0.0
                                                                         1017.17
15
                      288.0
                                                      0.0
                                     11.2700
                                                                         1016.47
                                     11.2700
                                                      0.0
16
                      251.0
                                                                         1016.15
17
                      230.0
                                     11.4471
                                                      0.0
                                                                         1016.17
18
                      163.0
                                     11.2056
                                                      0.0
                                                                         1015.82
19
                      139.0
                                     11.2056
                                                      0.0
                                                                         1015.83
```

Daily Summary

- 10 Partly cloudy throughout the day.
- 11 Partly cloudy throughout the day.
- 12 Partly cloudy throughout the day.
- 13 Partly cloudy throughout the day.
- 14 Partly cloudy throughout the day.
- 15 Partly cloudy throughout the day.
- 16 Partly cloudy throughout the day.
- 17 Partly cloudy throughout the day.
- 18 Partly cloudy throughout the day.
- 19 Partly cloudy throughout the day.

[23]: #show all the rows and all the columns except th last col df.iloc[:,:-1]

| [23]: | | Formatted D | ate | Summary | Precip | Type \ | | |
|-------|-----------------------------------|--|-------|--|------------------------------|--------|---|---|
| | 0 | 2006-04-01 00:00:00.000 +0 | 200 | Partly Cloudy | 7 | rain | | |
| | 1 | 2006-04-01 01:00:00.000 +0 | 200 | Partly Cloudy | Τ | rain | | |
| | 2 | 2006-04-01 02:00:00.000 +0 | 200 | Mostly Cloudy | τ | rain | | |
| | 3 | 2006-04-01 03:00:00.000 +0 | 200 | Partly Cloudy | 7 | rain | | |
| | 4 | 2006-04-01 04:00:00.000 +0 | 200 | Mostly Cloudy | 7 | rain | | |
| | | ••• | | | ••• | | | |
| | 96448 | 2016-09-09 19:00:00.000 +0 | 200 | Partly Cloudy | Τ | rain | | |
| | 96449 | 2016-09-09 20:00:00.000 +0 | 200 | Partly Cloudy | Τ | rain | | |
| | 96450 | 2016-09-09 21:00:00.000 +0 | 200 | Partly Cloudy | T | rain | | |
| | 96451 | 2016-09-09 22:00:00.000 +0 | 200 | Partly Cloudy | Τ | rain | | |
| | 96452 | 2016-09-09 23:00:00.000 +0 | 200 | Partly Cloudy | τ | rain | | |
| | | - (5) | _ | (2) | | | . (- (-) | , |
| | _ | Temperature (C) Apparent | Tempe | | • | Wind S | - | \ |
| | 0 | 9.472222 | | 7.388889 | 0.89 | | 14.1197 | |
| | | | | 1.000000 | | | | |
| | 1 | 9.355556 | | 7.227778 | 0.86 | | 14.2646 | |
| | 1 2 | 9.355556 9.377778 | | | | | | |
| | | | | 7.227778 | 0.86 | | 14.2646 | |
| | 2 | 9.377778 | | 7.227778 9.377778 | 0.86 0.89 | | 14.2646 3.9284 | |
| | 2 3 | 9.377778 8.288889 | | 7.227778 9.377778 5.944444 | 0.86 0.89 0.83 | | 14.2646 3.9284 14.1036 | |
| | 2 3 4 | 9.377778 8.288889 8.755556 | | 7.227778 9.377778 5.944444 | 0.86 0.89 0.83 | | 14.2646 3.9284 14.1036 11.0446 | |
| | 2 3 4 | 9.377778 8.288889 8.755556 | | 7.227778 9.377778 5.944444 6.977778 | 0.86 0.89 0.83 0.83 | | 14.2646 3.9284 14.1036 11.0446 | |
| | 2 3 4 96448 | 9.377778 8.288889 8.755556 26.016667 | | 7.227778 9.377778 5.944444 6.977778 26.016667 | 0.86 0.89 0.83 0.83 | | 14.2646 3.9284 14.1036 11.0446 10.9963 | |
| | 2 3 4 96448 96449 | 9.377778 8.288889 8.755556 26.016667 24.583333 | | 7.227778 9.377778 5.944444 6.977778 26.016667 24.583333 | 0.86 0.89 0.83 0.83 | | 14.2646 3.9284 14.1036 11.0446 10.9963 10.0947 | |

| | 96452 | 20.43 | 88889 | | 20.43888 | 39 | 0.61 | | | 5.8765 |
|-------|-----------|--------------|------------------------------|---------------------|-------------|-------|--------|------|---|--------|
| | | Wind Bearin | ıg (degrees) | Vicibi ⁻ | litz (lzm) | Louid | Cover | \ | | |
| | 0 | wind bearin | 251.0 | V 15101. | 15.8263 | Louc | 0.0 | ` | | |
| | | | | | | | | | | |
| | 1 | | 259.0 | | 15.8263 | | 0.0 | | | |
| | 2 | | 204.0 | | 14.9569 | | 0.0 | | | |
| | 3 | | 269.0 | | 15.8263 | | 0.0 | | | |
| | 4 | | 259.0 | | 15.8263 | | 0.0 | | | |
| | 96448 | | 31.0 | | 16.1000 | ••• | 0.0 | | | |
| | 96449 | | 20.0 | | 15.5526 | | 0.0 | | | |
| | | | | | | | | | | |
| | 96450 | | 30.0 | | 16.1000 | | 0.0 | | | |
| | 96451 | | 20.0 | | 16.1000 | | 0.0 | | | |
| | 96452 | | 39.0 | | 15.5204 | | 0.0 | | | |
| | | Pressure (m | nillibars) | | | | | | | |
| | 0 | | 1015.13 | | | | | | | |
| | 1 | | 1015.63 | | | | | | | |
| | 2 | | 1015.94 | | | | | | | |
| | 3 | | 1016.41 | | | | | | | |
| | 4 | | 1016.51 | | | | | | | |
| | | | | | | | | | | |
| | 96448 | | 1014.36 | | | | | | | |
| | 96449 | | 1015.16 | | | | | | | |
| | | | | | | | | | | |
| | 96450 | | 1015.66 | | | | | | | |
| | 96451 | | 1015.95 | | | | | | | |
| | 96452 | | 1016.16 | | | | | | | |
| | [96453 | rows x 11 c | columns] | | | | | | | |
| | | | | | | | | | | |
| | USing | Conditions: | | | | | | | | |
| | | | rds where hum | idity=1 | | | | | | |
| | | 'Humidity']= | | | | | | | | |
| [24]: | | | Formatte | d Date | 9111 | nmarv | Precip | Tyne | \ | |
| LZTJ. | 319 | 2006-04-21 | 07:00:00.000 | | | oggy | ттостр | rain | ` | |
| | 342 | | 06:00:00.000 | | | oggy | | rain | | |
| | | | | | | | | | | |
| | 390 | | 06:00:00.000 07:00:00.000 | | | Toggy | | rain | | |
| | 535 | | | | | Clear | | rain | | |
| | 536 | 2006-04-03 | 08:00:00.000 | | (| Clear | | rain | | |
| | 95907 | 2016-09-16 | 06:00:00.000 | +0200 | F | oggy | ••• | rain | | |
| | 96123 | | 06:00:00.000 | | Partly Cl | | | rain | | |
| | 96148 | | 07:00:00.000 | | Mostly Cl | • | | rain | | |
| | 20140 | 2010-09-25 | 07.00.00.000 | 10200 | M 13 C | Loudy | | | | |

Mostly Cloudy

Mostly Cloudy

rain

rain

96363 2016-09-06 06:00:00.000 +0200

96364 2016-09-06 07:00:00.000 +0200

```
342
                     7.155556
                                                 7.155556
                                                                 1.0
                                                                                  1.8515
      390
                                                                 1.0
                     7.688889
                                                 7.688889
                                                                                  0.0000
      535
                     5.933333
                                                 5.933333
                                                                 1.0
                                                                                  0.1449
      536
                    10.405556
                                                10.405556
                                                                 1.0
                                                                                  0.7245
                    14.905556
      95907
                                                14.905556
                                                                 1.0
                                                                                  7.5992
      96123
                     7.594444
                                                                 1.0
                                                                                  4.8300
                                                 7.594444
      96148
                     8.838889
                                                 8.838889
                                                                 1.0
                                                                                  4.5402
      96363
                    12.338889
                                                12.338889
                                                                 1.0
                                                                                  3.5581
      96364
                    12.872222
                                                12.872222
                                                                 1.0
                                                                                  4.5241
             Wind Bearing (degrees)
                                       Visibility (km)
                                                         Loud Cover
      319
                                 10.0
                                                 1.2558
                                                                 0.0
      342
                                319.0
                                                                 0.0
                                                 0.2898
      390
                                                                 0.0
                                  0.0
                                                 0.7406
      535
                                230.0
                                                 5.8443
                                                                 0.0
      536
                                                                 0.0
                                 18.0
                                                 5.3935
      95907
                                169.0
                                                 1.6100
                                                                 0.0
      96123
                                160.0
                                                 6.2951
                                                                 0.0
      96148
                                349.0
                                                 6.1985
                                                                 0.0
      96363
                                301.0
                                                 8.0500
                                                                 0.0
      96364
                                339.0
                                                 9.9820
                                                                 0.0
             Pressure (millibars)
                                                                           Daily Summary
      319
                           1016.45
                                                                   Foggy in the morning.
      342
                           1017.15
                                     Foggy starting overnight continuing until morn...
      390
                           1018.13
                                                           Partly cloudy until evening.
      535
                           1014.55
                                                              Partly cloudy until night.
      536
                           1014.91
                                                             Partly cloudy until night.
      95907
                                              Partly cloudy starting in the afternoon.
                           1016.51
      96123
                           1026.93
                                                 Partly cloudy starting in the morning.
      96148
                           1022.88
                                                             Mostly cloudy until night.
      96363
                           1014.45
                                                      Mostly cloudy starting overnight.
      96364
                           1014.84
                                                      Mostly cloudy starting overnight.
      [2890 rows x 12 columns]
[25]: # show all the columns and rows where humidity=1
      df[df['Humidity']==1]
[25]:
                             Formatted Date
                                                     Summary Precip Type \
             2006-04-21 07:00:00.000 +0200
      319
                                                                     rain
                                                       Foggy
```

Apparent Temperature (C)

11.972222

Humidity Wind Speed (km/h)

9.6600

1.0

Temperature (C)

11.972222

319

342

2006-04-22 06:00:00.000 +0200

Foggy

rain

```
390
       2006-04-24 06:00:00.000 +0200
                                                 Foggy
                                                               rain
535
       2006-04-03 07:00:00.000 +0200
                                                 Clear
                                                               rain
536
       2006-04-03 08:00:00.000 +0200
                                                 Clear
                                                               rain
95907
       2016-09-16 06:00:00.000 +0200
                                                 Foggy
                                                              rain
       2016-09-24 06:00:00.000 +0200
                                        Partly Cloudy
96123
                                                              rain
96148
       2016-09-25 07:00:00.000 +0200
                                        Mostly Cloudy
                                                              rain
       2016-09-06 06:00:00.000 +0200
                                        Mostly Cloudy
96363
                                                               rain
96364
      2016-09-06 07:00:00.000 +0200
                                        Mostly Cloudy
                                                               rain
                         Apparent Temperature (C) Humidity Wind Speed (km/h)
       Temperature (C)
319
              11.972222
                                         11.972222
                                                          1.0
                                                                           9.6600
342
               7.155556
                                          7.155556
                                                          1.0
                                                                           1.8515
390
               7.688889
                                          7.688889
                                                          1.0
                                                                           0.0000
535
               5.933333
                                          5.933333
                                                          1.0
                                                                           0.1449
536
              10.405556
                                         10.405556
                                                          1.0
                                                                           0.7245
95907
              14.905556
                                         14.905556
                                                          1.0
                                                                           7.5992
                                                          1.0
96123
               7.594444
                                          7.594444
                                                                           4.8300
96148
               8.838889
                                          8.838889
                                                          1.0
                                                                           4.5402
96363
              12.338889
                                                                           3.5581
                                         12.338889
                                                          1.0
96364
              12.872222
                                         12.872222
                                                          1.0
                                                                           4.5241
                                                   Loud Cover
       Wind Bearing (degrees)
                                Visibility (km)
                                          1.2558
319
                          10.0
                                                          0.0
342
                         319.0
                                          0.2898
                                                          0.0
390
                                          0.7406
                           0.0
                                                          0.0
535
                         230.0
                                          5.8443
                                                          0.0
536
                          18.0
                                          5.3935
                                                          0.0
95907
                         169.0
                                                          0.0
                                          1.6100
                                                          0.0
96123
                         160.0
                                          6.2951
                                                          0.0
96148
                         349.0
                                          6.1985
96363
                         301.0
                                          8.0500
                                                          0.0
96364
                         339.0
                                          9.9820
                                                          0.0
       Pressure (millibars)
                                                                     Daily Summary
319
                     1016.45
                                                            Foggy in the morning.
342
                     1017.15
                              Foggy starting overnight continuing until morn...
390
                     1018.13
                                                     Partly cloudy until evening.
535
                     1014.55
                                                       Partly cloudy until night.
                                                       Partly cloudy until night.
536
                     1014.91
95907
                     1016.51
                                        Partly cloudy starting in the afternoon.
                     1026.93
                                          Partly cloudy starting in the morning.
96123
96148
                     1022.88
                                                       Mostly cloudy until night.
96363
                     1014.45
                                                Mostly cloudy starting overnight.
```

96364

1014.84

[2890 rows x 12 columns]

```
[26]: # Show the no of values contains each column
      df[df['Humidity']==1].count()
[26]: Formatted Date
                                  2890
                                  2890
      Summary
      Precip Type
                                  2888
      Temperature (C)
                                  2890
      Apparent Temperature (C)
                                  2890
      Humidity
                                  2890
      Wind Speed (km/h)
                                  2890
      Wind Bearing (degrees)
                                  2890
     Visibility (km)
                                  2890
     Loud Cover
                                  2890
      Pressure (millibars)
                                  2890
      Daily Summary
                                  2890
      dtype: int64
[27]: # show no of rows satisfies the condition and only the value of a particular
      df[df['Humidity']==1]['Precip Type'].count()
[27]: 2888
[28]: df [df ['Humidity'] == 1].shape[0]
[28]: 2890
[29]: #show the records where humidity >0.95 Wind Speed (km/h)>=8.9
      df[(df['Humidity']>=0.95) & (df['Wind Speed (km/h)']>=8.9)]
[29]:
                            Formatted Date
                                                  Summary Precip Type \
             2006-04-01 06:00:00.000 +0200 Partly Cloudy
      6
                                                                  rain
             2006-04-11 05:00:00.000 +0200
                                                  Overcast
                                                                  rain
             2006-04-11 19:00:00.000 +0200
                                                     Foggy
                                                                  rain
      69
             2006-04-11 21:00:00.000 +0200
                                                  Overcast
                                                                  rain
      70
             2006-04-11 22:00:00.000 +0200
                                                  Overcast
                                                                  rain
      95991 2016-09-19 18:00:00.000 +0200
                                                  Overcast
                                                                  rain
      95992 2016-09-19 19:00:00.000 +0200
                                                  Overcast
                                                                  rain
      95995
            2016-09-19 22:00:00.000 +0200
                                                  Overcast
                                                                  rain
      96024 2016-09-20 03:00:00.000 +0200
                                                  Overcast
                                                                  rain
      96386 2016-09-07 05:00:00.000 +0200 Mostly Cloudy
                                                                  rain
             Temperature (C) Apparent Temperature (C) Humidity Wind Speed (km/h) \
```

```
0.95
      6
                    7.733333
                                               5.522222
                                                                               12.3648
      53
                                               10.694444
                                                              0.95
                   10.694444
                                                                               10.4006
      67
                    8.800000
                                               5.294444
                                                              0.99
                                                                               26.5006
      69
                                               4.605556
                                                              0.96
                    8.200000
                                                                               25.4219
      70
                    7.688889
                                               3.722222
                                                              0.96
                                                                               28.1267
                                               17.688889
      95991
                   17.688889
                                                              0.97
                                                                               11.1573
      95992
                                                              0.97
                   17.688889
                                               17.688889
                                                                               12.1716
      95995
                   16.550000
                                               16.550000
                                                              0.97
                                                                               13.7977
      96024
                   14.422222
                                               14.422222
                                                              0.96
                                                                               16.8406
      96386
                   16.705556
                                               16.705556
                                                              0.97
                                                                               13.3147
             Wind Bearing (degrees) Visibility (km) Loud Cover \
      6
                               259.0
                                               9.9820
                                                               0.0
      53
                               161.0
                                               6.6976
                                                               0.0
      67
                               339.0
                                               2.6565
                                                               0.0
      69
                                                               0.0
                               330.0
                                               4.4919
      70
                               339.0
                                               4.4436
                                                               0.0
                                                               0.0
      95991
                               342.0
                                               8.0500
      95992
                               312.0
                                               6.2951
                                                               0.0
      95995
                                 1.0
                                               9.8049
                                                               0.0
      96024
                               350.0
                                               4.1699
                                                               0.0
                                21.0
      96386
                                               14.1197
                                                               0.0
             Pressure (millibars)
                                                         Daily Summary
      6
                           1016.72 Partly cloudy throughout the day.
      53
                           1006.59
                                                Foggy in the evening.
                           1004.99
                                                 Foggy in the evening.
      67
      69
                           1004.96
                                                Foggy in the evening.
      70
                           1005.14
                                                 Foggy in the evening.
                             •••
                           1004.80
                                         Overcast throughout the day.
      95991
      95992
                                         Overcast throughout the day.
                           1004.99
      95995
                           1005.54
                                         Overcast throughout the day.
      96024
                           1006.53 Mostly cloudy throughout the day.
      96386
                           1021.47 Partly cloudy throughout the day.
      [3726 rows x 12 columns]
[30]: \#show the records where humidity >0.95 Wind Speed (km/h)>=8.9 values of th_{\sqcup}
       ⇔columns Formatted Date
                                        Summary
                                                       Precip Type
```

'Precip Type',⊔

,'Wind Speed (km/h)']][(df['Humidity']>=0.95) & (df['Wind_

Wind Speed (km/h)

'Summary',

 \hookrightarrow Humidity

df[['Formatted Date',

 \hookrightarrow Speed (km/h)']>=8.9)]

```
[30]:
                             Formatted Date
                                                    Summary Precip Type Humidity \
             2006-04-01 06:00:00.000 +0200
                                             Partly Cloudy
                                                                              0.95
      6
                                                                    rain
             2006-04-11 05:00:00.000 +0200
                                                   Overcast
                                                                    rain
                                                                              0.95
      53
      67
             2006-04-11 19:00:00.000 +0200
                                                      Foggy
                                                                   rain
                                                                              0.99
      69
             2006-04-11 21:00:00.000 +0200
                                                   Overcast
                                                                    rain
                                                                              0.96
      70
             2006-04-11 22:00:00.000 +0200
                                                   Overcast
                                                                              0.96
                                                                    rain
             2016-09-19 18:00:00.000 +0200
      95991
                                                   Overcast
                                                                   rain
                                                                              0.97
      95992
             2016-09-19 19:00:00.000 +0200
                                                   Overcast
                                                                   rain
                                                                              0.97
             2016-09-19 22:00:00.000 +0200
      95995
                                                   Overcast
                                                                   rain
                                                                              0.97
      96024
             2016-09-20 03:00:00.000 +0200
                                                                              0.96
                                                   Overcast
                                                                   rain
      96386
             2016-09-07 05:00:00.000 +0200
                                                                              0.97
                                             Mostly Cloudy
                                                                    rain
             Wind Speed (km/h)
      6
                        12.3648
      53
                        10.4006
      67
                        26.5006
      69
                        25.4219
      70
                        28.1267
      95991
                        11.1573
      95992
                        12.1716
      95995
                        13.7977
      96024
                        16.8406
      96386
                        13.3147
      [3726 rows x 5 columns]
[31]: df.describe(include='object')
[31]:
                              Formatted Date
                                                     Summary Precip Type ∖
      count
                                                       96453
                                                                    95936
                                       96453
                                       96429
                                                          27
                                                                        2
      unique
              2010-08-02 00:00:00.000 +0200
      top
                                              Partly Cloudy
                                                                     rain
                                                                    85224
      freq
                                                       31733
                                   Daily Summary
      count
                                           96453
      unique
                                              214
      top
              Mostly cloudy throughout the day.
                                            20085
      freq
[32]: #show the no of values we have for each unique values of Summmary
      df['Summary'].value_counts()
[32]: Summary
```

31733

Partly Cloudy

```
Mostly Cloudy
                                             28094
      Overcast
                                             16597
      Clear
                                             10890
     Foggy
                                              7148
     Breezy and Overcast
                                               528
     Breezy and Mostly Cloudy
                                               516
     Breezy and Partly Cloudy
                                               386
     Dry and Partly Cloudy
                                                86
     Windy and Partly Cloudy
                                                67
     Light Rain
                                                63
     Breezy
                                                54
     Windy and Overcast
                                                45
     Humid and Mostly Cloudy
                                                40
     Drizzle
                                                39
                                                35
      Breezy and Foggy
     Windy and Mostly Cloudy
                                                35
                                                34
      Humid and Partly Cloudy
                                                17
      Dry and Mostly Cloudy
                                                14
      Rain
                                                10
      Windy
                                                 8
     Humid and Overcast
                                                 7
     Windy and Foggy
                                                 4
     Windy and Dry
                                                 1
     Dangerously Windy and Partly Cloudy
                                                 1
      Breezy and Dry
                                                 1
      Name: count, dtype: int64
[33]: df['Precip Type'].unique()
[33]: array(['rain', 'snow', nan], dtype=object)
[34]: #show me the reocrds for the summary=Partly cloudy , Mostly Cloudy
      df[['Formatted Date',
                                   'Summary',
                                                     'Precip Type',⊔
       ,'Wind Speed (km/h)']][(df['Summary']=='Windy and Foggy')
                                | (df['Summary']=='Windy and_
       →Dry') | (df['Summary']=='Windy')]
[34]:
                            Formatted Date
                                                    Summary Precip Type Humidity \
             2006-07-08 18:00:00.000 +0200
                                            Windy and Foggy
      4338
                                                                   rain
                                                                              0.76
      5190
             2006-03-13 06:00:00.000 +0100
                                            Windy and Foggy
                                                                              0.95
                                                                    snow
      20930 2008-01-28 02:00:00.000 +0100
                                                                              0.45
                                                      Windy
                                                                   rain
      31640
            2009-03-18 08:00:00.000 +0100
                                                      Windy
                                                                   rain
                                                                              0.60
      31644 2009-03-18 12:00:00.000 +0100
                                                      Windy
                                                                   rain
                                                                             0.41
      43944 2011-04-13 00:00:00.000 +0200
                                                      Windy
                                                                   rain
                                                                              0.57
      53124 2012-04-29 12:00:00.000 +0200
                                              Windy and Dry
                                                                   rain
                                                                              0.24
      67437 2013-05-17 22:00:00.000 +0200
                                            Windy and Foggy
                                                                             0.96
                                                                   rain
```

```
71942
             2014-12-21 14:00:00.000 +0100
                                                       Windy
                                                                     rain
                                                                               0.55
      82400
             2015-01-04 11:00:00.000 +0100
                                                                               0.70
                                                       Windy
                                                                     rain
      82401
             2015-01-04 12:00:00.000 +0100
                                                       Windy
                                                                     rain
                                                                               0.65
             2015-01-04 14:00:00.000 +0100
      82403
                                                       Windy
                                                                     rain
                                                                               0.65
      84861
             2015-05-14 01:00:00.000 +0200
                                             Windy and Foggy
                                                                               0.93
                                                                     rain
             Wind Speed (km/h)
      4338
                       45.9333
      5190
                       43.8564
      20930
                       42.5362
      31640
                       45.0800
      31644
                       45.0800
      43944
                       41.1999
      53124
                       40.2500
      67437
                       40.3144
      71942
                       40.2983
      82400
                       42.0854
      82401
                       40.5398
      82403
                       40.5076
      84861
                       46.6095
[35]: #isin([<list of values>])
      df[['Formatted Date',
                                    'Summary',
                                                       'Precip Type',⊔
       ,'Wind Speed (km/h)']][df['Summary'].isin(['Windy and_
       →Foggy','Windy and Dry','Windy'])]
[35]:
                            Formatted Date
                                                     Summary Precip Type Humidity
             2006-07-08 18:00:00.000 +0200
                                             Windy and Foggy
      4338
                                                                     rain
                                                                               0.76
      5190
             2006-03-13 06:00:00.000 +0100
                                             Windy and Foggy
                                                                     snow
                                                                               0.95
             2008-01-28 02:00:00.000 +0100
      20930
                                                       Windy
                                                                     rain
                                                                               0.45
      31640
             2009-03-18 08:00:00.000 +0100
                                                       Windy
                                                                               0.60
                                                                     rain
      31644
             2009-03-18 12:00:00.000 +0100
                                                       Windy
                                                                     rain
                                                                               0.41
             2011-04-13 00:00:00.000 +0200
      43944
                                                       Windy
                                                                     rain
                                                                               0.57
      53124
             2012-04-29 12:00:00.000 +0200
                                               Windy and Dry
                                                                               0.24
                                                                     rain
             2013-05-17 22:00:00.000 +0200
      67437
                                             Windy and Foggy
                                                                               0.96
                                                                     rain
      71942
             2014-12-21 14:00:00.000 +0100
                                                       Windy
                                                                               0.55
                                                                     rain
      82400
             2015-01-04 11:00:00.000 +0100
                                                       Windy
                                                                               0.70
                                                                     rain
             2015-01-04 12:00:00.000 +0100
      82401
                                                       Windy
                                                                               0.65
                                                                     rain
      82403
             2015-01-04 14:00:00.000 +0100
                                                       Windy
                                                                               0.65
                                                                     rain
                                                                               0.93
      84861
             2015-05-14 01:00:00.000 +0200
                                             Windy and Foggy
                                                                     rain
             Wind Speed (km/h)
      4338
                       45.9333
      5190
                       43.8564
      20930
                       42.5362
      31640
                       45.0800
                       45.0800
      31644
```

```
67437
                        40.3144
      71942
                        40.2983
      82400
                        42.0854
      82401
                        40.5398
      82403
                        40.5076
      84861
                        46.6095
[36]: # Show all the records where precip type not equal to rain
      df[df['Precip Type']!='rain']
[36]:
                             Formatted Date
                                                     Summary Precip Type
      1562
             2006-12-13 02:00:00.000 +0100
                                                       Foggy
                                                                     snow
             2006-12-13 03:00:00.000 +0100
      1563
                                                       Foggy
                                                                     snow
             2006-12-13 04:00:00.000 +0100
      1564
                                                       Foggy
                                                                     snow
      1565
             2006-12-13 05:00:00.000 +0100
                                                       Foggy
                                                                     snow
             2006-12-13 06:00:00.000 +0100
      1566
                                                       Foggy
                                                                     snow
             2016-10-31 19:00:00.000 +0100
      95584
                                              Mostly Cloudy
                                                                      NaN
             2016-10-31 20:00:00.000 +0100
      95585
                                              Mostly Cloudy
                                                                      NaN
             2016-10-31 21:00:00.000 +0100
                                              Mostly Cloudy
      95586
                                                                      NaN
             2016-10-31 22:00:00.000 +0100
      95587
                                              Partly Cloudy
                                                                      NaN
      95588
             2016-10-31 23:00:00.000 +0100
                                              Mostly Cloudy
                                                                      NaN
             Temperature (C)
                               Apparent Temperature (C)
                                                           Humidity Wind Speed (km/h)
      1562
                    -0.483333
                                               -4.150000
                                                                1.00
                                                                                 11.0929
      1563
                    -0.483333
                                               -4.061111
                                                               0.96
                                                                                 10.7387
      1564
                    -0.922222
                                               -3.477778
                                                               1.00
                                                                                 7.0679
      1565
                    -1.038889
                                               -4.400000
                                                                1.00
                                                                                 9.4990
                    -1.088889
      1566
                                                -4.438889
                                                                1.00
                                                                                 9.4346
      95584
                     8.322222
                                                7.044444
                                                               0.85
                                                                                 8.0339
                     7.627778
                                                6.183333
                                                               0.87
                                                                                 8.2271
      95585
      95586
                     7.111111
                                                5.511111
                                                               0.89
                                                                                 8.5008
                                                4.961111
      95587
                     6.672222
                                                               0.90
                                                                                 8.6457
      95588
                     6.32222
                                                4.588889
                                                               0.91
                                                                                 8.4686
             Wind Bearing (degrees)
                                       Visibility (km)
                                                         Loud Cover
      1562
                               219.0
                                                  0.483
                                                                0.0
      1563
                               200.0
                                                  0.322
                                                                0.0
      1564
                               206.0
                                                  0.161
                                                                0.0
      1565
                               199.0
                                                  0.161
                                                                0.0
      1566
                               219.0
                                                  0.322
                                                                0.0
                               290.0
                                                  0.000
                                                                0.0
      95584
                                                                0.0
                               293.0
                                                  0.000
      95585
```

43944

53124

41.1999

40.2500

```
297.0
                                                0.000
                                                              0.0
      95586
      95587
                              299.0
                                                0.000
                                                              0.0
      95588
                              299.0
                                                0.000
                                                              0.0
             Pressure (millibars)
                                                               Daily Summary
                          1031.56
                                                   Foggy throughout the day.
      1562
      1563
                          1031.47
                                                   Foggy throughout the day.
      1564
                                                   Foggy throughout the day.
                          1031.23
                                                   Foggy throughout the day.
      1565
                          1031.41
      1566
                          1031.98
                                                   Foggy throughout the day.
      95584
                          1021.73 Mostly cloudy starting in the afternoon.
      95585
                          1021.76 Mostly cloudy starting in the afternoon.
                          1021.81 Mostly cloudy starting in the afternoon.
      95586
      95587
                          1021.83 Mostly cloudy starting in the afternoon.
                          1021.80 Mostly cloudy starting in the afternoon.
      95588
      [11229 rows x 12 columns]
     Using Mathematical Finctions
[37]: #show the max value of each column
      df.max(numeric_only=True)
[37]: Temperature (C)
                                     39.905556
      Apparent Temperature (C)
                                     39.344444
      Humidity
                                      1.000000
      Wind Speed (km/h)
                                     63.852600
      Wind Bearing (degrees)
                                    359.000000
      Visibility (km)
                                     16.100000
      Loud Cover
                                      0.000000
      Pressure (millibars)
                                  1046.380000
      dtype: float64
[38]: #max of of particular column
      df['Humidity'].min()
[38]: 0.0
[39]: df['Humidity'].max()
[39]: 1.0
[40]: df['Humidity'].mean()
```

Data Cleaning and Manipulation

[40]: 0.7348989663359355

```
[41]: #Create a new df with values>0
      df_clean=df[(df['Humidity']>0) & (df['Wind Speed (km/h)']>0)& (df['Temperature_
       →(C)']>0)& (df['Apparent Temperature (C)']>0) & (df['Wind Bearing_

⟨degrees)']>0)]
[42]:
     df_clean.describe()
[42]:
             Temperature (C)
                               Apparent Temperature (C)
                                                               Humidity \
                76534.000000
                                            76534.000000
                                                           76534.000000
      count
                    14.985860
                                               14.406166
                                                               0.706184
      mean
      std
                     7.796182
                                                8.448812
                                                               0.200611
      min
                     0.005556
                                                0.005556
                                                               0.120000
      25%
                     8.611111
                                                6.933333
                                                               0.550000
      50%
                    14.42222
                                               14.42222
                                                               0.740000
      75%
                    20.458333
                                               20.458333
                                                               0.870000
                    39.905556
                                               39.344444
                                                               1.000000
      max
                                 Wind Bearing (degrees)
                                                           Visibility (km)
                                                                            Loud Cover
             Wind Speed (km/h)
      count
                  76534.000000
                                            76534.000000
                                                              76534.000000
                                                                                76534.0
                      10.776869
                                              193.989913
                                                                 10.988979
                                                                                    0.0
      mean
                       6.784777
                                              104.542308
                                                                                    0.0
      std
                                                                  3.775415
      min
                       0.032200
                                                1.000000
                                                                  0.00000
                                                                                    0.0
      25%
                       5.779900
                                              128.000000
                                                                                    0.0
                                                                  9.982000
      50%
                       9.837100
                                              187.000000
                                                                 10.352300
                                                                                    0.0
      75%
                      14.087500
                                              292.000000
                                                                                    0.0
                                                                 14.956900
                      63.852600
                                              359.000000
                                                                 16.100000
                                                                                    0.0
      max
             Pressure (millibars)
                      76534.000000
      count
                       1003.154809
      mean
                        112.614199
      std
      min
                          0.000000
      25%
                       1011.510000
      50%
                       1015.710000
      75%
                       1019.800000
                       1042.380000
      max
[43]: #drop the column loud Cover
      df_clean.drop(columns=['Loud Cover'],axis=1) #axis=1 when we want of drop_
       ⇔column by default axis=0 i.e rows
[43]:
                             Formatted Date
                                                    Summary Precip Type
      0
             2006-04-01 00:00:00.000 +0200
                                              Partly Cloudy
                                                                    rain
      1
             2006-04-01 01:00:00.000 +0200
                                              Partly Cloudy
                                                                    rain
      2
             2006-04-01 02:00:00.000 +0200
                                              Mostly Cloudy
                                                                    rain
      3
             2006-04-01 03:00:00.000 +0200
                                              Partly Cloudy
                                                                    rain
      4
             2006-04-01 04:00:00.000 +0200
                                              Mostly Cloudy
                                                                    rain
```

```
96448
       2016-09-09 19:00:00.000 +0200
                                        Partly Cloudy
                                                              rain
96449
       2016-09-09 20:00:00.000 +0200
                                        Partly Cloudy
                                                              rain
                                        Partly Cloudy
96450
       2016-09-09 21:00:00.000 +0200
                                                              rain
96451
       2016-09-09 22:00:00.000 +0200
                                        Partly Cloudy
                                                              rain
96452
       2016-09-09 23:00:00.000 +0200
                                        Partly Cloudy
                                                              rain
       Temperature (C)
                         Apparent Temperature (C)
                                                     Humidity
                                                               Wind Speed (km/h)
                                                         0.89
0
               9.472222
                                          7.388889
                                                                          14.1197
1
               9.355556
                                                         0.86
                                                                          14.2646
                                          7.227778
2
               9.377778
                                          9.377778
                                                         0.89
                                                                           3.9284
3
               8.288889
                                          5.944444
                                                         0.83
                                                                          14.1036
4
               8.755556
                                          6.977778
                                                         0.83
                                                                          11.0446
                                                                          10.9963
             26.016667
                                         26.016667
                                                         0.43
96448
96449
             24.583333
                                         24.583333
                                                         0.48
                                                                          10.0947
96450
                                                         0.56
             22.038889
                                         22.038889
                                                                           8.9838
96451
             21.522222
                                         21.522222
                                                         0.60
                                                                          10.5294
96452
              20.438889
                                         20.438889
                                                         0.61
                                                                           5.8765
       Wind Bearing (degrees)
                                 Visibility (km)
                                                   Pressure (millibars)
0
                         251.0
                                         15.8263
                                                                 1015.13
1
                         259.0
                                         15.8263
                                                                 1015.63
2
                         204.0
                                         14.9569
                                                                 1015.94
3
                         269.0
                                         15.8263
                                                                 1016.41
4
                         259.0
                                         15.8263
                                                                 1016.51
                                                                 1014.36
96448
                          31.0
                                         16.1000
96449
                          20.0
                                         15.5526
                                                                 1015.16
                          30.0
96450
                                         16.1000
                                                                 1015.66
96451
                          20.0
                                         16.1000
                                                                 1015.95
96452
                          39.0
                                         15.5204
                                                                 1016.16
                                  Daily Summary
0
            Partly cloudy throughout the day.
1
            Partly cloudy throughout the day.
2
            Partly cloudy throughout the day.
3
            Partly cloudy throughout the day.
4
            Partly cloudy throughout the day.
96448 Partly cloudy starting in the morning.
96449
       Partly cloudy starting in the morning.
       Partly cloudy starting in the morning.
96450
96451 Partly cloudy starting in the morning.
96452 Partly cloudy starting in the morning.
```

[76534 rows x 11 columns]

```
[44]: df_clean.head()
[44]:
                        Formatted Date
                                               Summary Precip Type
                                                                     Temperature (C)
         2006-04-01 00:00:00.000 +0200
                                        Partly Cloudy
                                                               rain
                                                                            9.472222
      1 2006-04-01 01:00:00.000 +0200
                                         Partly Cloudy
                                                                            9.355556
                                                               rain
      2 2006-04-01 02:00:00.000 +0200
                                         Mostly Cloudy
                                                               rain
                                                                            9.377778
      3 2006-04-01 03:00:00.000 +0200
                                         Partly Cloudy
                                                               rain
                                                                            8.288889
      4 2006-04-01 04:00:00.000 +0200
                                         Mostly Cloudy
                                                                            8.755556
                                                               rain
         Apparent Temperature (C)
                                    Humidity
                                              Wind Speed (km/h)
      0
                         7.388889
                                        0.89
                                                         14.1197
      1
                         7.227778
                                        0.86
                                                         14.2646
      2
                         9.377778
                                        0.89
                                                          3.9284
      3
                         5.944444
                                        0.83
                                                         14.1036
      4
                         6.977778
                                        0.83
                                                         11.0446
         Wind Bearing (degrees)
                                  Visibility (km)
                                                   Loud Cover
                                                               Pressure (millibars)
      0
                                          15.8263
                                                           0.0
                           251.0
                                                                             1015.13
      1
                           259.0
                                          15.8263
                                                           0.0
                                                                             1015.63
      2
                           204.0
                                          14.9569
                                                           0.0
                                                                             1015.94
      3
                           269.0
                                          15.8263
                                                           0.0
                                                                             1016.41
      4
                           259.0
                                          15.8263
                                                           0.0
                                                                             1016.51
                              Daily Summary
      O Partly cloudy throughout the day.
      1 Partly cloudy throughout the day.
      2 Partly cloudy throughout the day.
      3 Partly cloudy throughout the day.
      4 Partly cloudy throughout the day.
[45]: #drop the column loud Cover and update the dataFrame
      df_clean.drop(columns=['Loud Cover']) #axis=1 when we want ot drop column by
       ⇔default axis=0 i.e rows
[45]:
                            Formatted Date
                                                   Summary Precip Type
      0
             2006-04-01 00:00:00.000 +0200
                                             Partly Cloudy
                                                                   rain
             2006-04-01 01:00:00.000 +0200
                                             Partly Cloudy
      1
                                                                   rain
      2
             2006-04-01 02:00:00.000 +0200
                                             Mostly Cloudy
                                                                   rain
             2006-04-01 03:00:00.000 +0200
                                             Partly Cloudy
                                                                   rain
      4
             2006-04-01 04:00:00.000 +0200
                                             Mostly Cloudy
                                                                   rain
      96448
             2016-09-09 19:00:00.000 +0200
                                             Partly Cloudy
                                                                   rain
      96449
             2016-09-09 20:00:00.000 +0200
                                             Partly Cloudy
                                                                   rain
                                             Partly Cloudy
      96450
             2016-09-09 21:00:00.000 +0200
                                                                   rain
      96451
             2016-09-09 22:00:00.000 +0200
                                             Partly Cloudy
                                                                   rain
      96452
             2016-09-09 23:00:00.000 +0200
                                             Partly Cloudy
                                                                   rain
```

```
Temperature (C)
                               Apparent Temperature (C)
                                                           Humidity
                                                                     Wind Speed (km/h)
                     9.472222
                                                7.388889
                                                               0.89
                                                                                14.1197
      0
      1
                     9.355556
                                                7.227778
                                                               0.86
                                                                                14.2646
      2
                     9.377778
                                                9.377778
                                                               0.89
                                                                                 3.9284
      3
                     8.288889
                                                5.944444
                                                               0.83
                                                                                14.1036
      4
                     8.755556
                                                6.977778
                                                               0.83
                                                                                11.0446
      96448
                   26.016667
                                               26.016667
                                                               0.43
                                                                                10.9963
                                                               0.48
      96449
                   24.583333
                                               24.583333
                                                                                10.0947
      96450
                   22.038889
                                               22.038889
                                                               0.56
                                                                                 8.9838
      96451
                   21.522222
                                               21.522222
                                                               0.60
                                                                                10.5294
      96452
                    20.438889
                                               20.438889
                                                               0.61
                                                                                 5.8765
                                       Visibility (km)
             Wind Bearing (degrees)
                                                         Pressure (millibars)
      0
                               251.0
                                               15.8263
                                                                       1015.13
      1
                               259.0
                                               15.8263
                                                                       1015.63
      2
                               204.0
                                               14.9569
                                                                       1015.94
      3
                               269.0
                                               15.8263
                                                                       1016.41
      4
                               259.0
                                               15.8263
                                                                       1016.51
      96448
                                31.0
                                               16.1000
                                                                       1014.36
                                               15.5526
      96449
                                20.0
                                                                       1015.16
      96450
                                30.0
                                               16.1000
                                                                       1015.66
      96451
                                20.0
                                               16.1000
                                                                       1015.95
      96452
                                39.0
                                               15.5204
                                                                       1016.16
                                        Daily Summary
      0
                  Partly cloudy throughout the day.
                  Partly cloudy throughout the day.
      1
      2
                  Partly cloudy throughout the day.
      3
                  Partly cloudy throughout the day.
      4
                  Partly cloudy throughout the day.
             Partly cloudy starting in the morning.
      96448
      96449
             Partly cloudy starting in the morning.
      96450
             Partly cloudy starting in the morning.
      96451 Partly cloudy starting in the morning.
      96452 Partly cloudy starting in the morning.
      [76534 rows x 11 columns]
[46]: df.drop(columns=['Loud Cover'],axis=1,inplace=True)
[47]: df
                                                    Summary Precip Type
[47]:
                             Formatted Date
      0
             2006-04-01 00:00:00.000 +0200 Partly Cloudy
                                                                    rain
```

```
2006-04-01 01:00:00.000 +0200
1
                                        Partly Cloudy
                                                              rain
2
                                        Mostly Cloudy
       2006-04-01 02:00:00.000 +0200
                                                              rain
3
       2006-04-01 03:00:00.000 +0200
                                        Partly Cloudy
                                                              rain
4
       2006-04-01 04:00:00.000 +0200
                                        Mostly Cloudy
                                                              rain
       2016-09-09 19:00:00.000 +0200
96448
                                        Partly Cloudy
                                                              rain
96449
       2016-09-09 20:00:00.000 +0200
                                        Partly Cloudy
                                                              rain
                                        Partly Cloudy
96450
       2016-09-09 21:00:00.000 +0200
                                                              rain
       2016-09-09 22:00:00.000 +0200
                                        Partly Cloudy
96451
                                                              rain
       2016-09-09 23:00:00.000 +0200
                                        Partly Cloudy
96452
                                                              rain
       Temperature (C)
                         Apparent Temperature (C)
                                                     Humidity
                                                               Wind Speed (km/h)
0
              9.472222
                                          7.388889
                                                         0.89
                                                                          14.1197
1
              9.355556
                                          7.227778
                                                         0.86
                                                                          14.2646
2
               9.377778
                                          9.377778
                                                         0.89
                                                                           3.9284
3
               8.288889
                                          5.944444
                                                         0.83
                                                                          14.1036
4
               8.755556
                                          6.977778
                                                         0.83
                                                                          11.0446
96448
             26.016667
                                         26.016667
                                                         0.43
                                                                          10.9963
                                         24.583333
96449
             24.583333
                                                         0.48
                                                                          10.0947
96450
             22.038889
                                         22.038889
                                                         0.56
                                                                           8.9838
                                                         0.60
96451
             21.522222
                                         21.522222
                                                                          10.5294
96452
             20.438889
                                         20.438889
                                                         0.61
                                                                           5.8765
       Wind Bearing (degrees)
                                Visibility (km)
                                                  Pressure (millibars)
0
                         251.0
                                         15.8263
                                                                1015.13
                                                                1015.63
1
                         259.0
                                         15.8263
2
                         204.0
                                         14.9569
                                                                1015.94
3
                         269.0
                                         15.8263
                                                                1016.41
4
                         259.0
                                         15.8263
                                                                1016.51
96448
                          31.0
                                         16.1000
                                                                1014.36
                          20.0
96449
                                         15.5526
                                                                1015.16
                          30.0
96450
                                         16.1000
                                                                1015.66
96451
                          20.0
                                         16.1000
                                                                1015.95
96452
                          39.0
                                         15.5204
                                                                1016.16
                                 Daily Summary
0
            Partly cloudy throughout the day.
1
            Partly cloudy throughout the day.
            Partly cloudy throughout the day.
            Partly cloudy throughout the day.
3
4
            Partly cloudy throughout the day.
      Partly cloudy starting in the morning.
96448
       Partly cloudy starting in the morning.
96449
96450
       Partly cloudy starting in the morning.
```

96451 Partly cloudy starting in the morning. 96452 Partly cloudy starting in the morning.

[96453 rows x 11 columns]

Pressure (millibars)

[48]: df_clean [48]: Summary Precip Type Formatted Date 0 2006-04-01 00:00:00.000 +0200 Partly Cloudy rain Partly Cloudy 1 2006-04-01 01:00:00.000 +0200 rain 2 2006-04-01 02:00:00.000 +0200 Mostly Cloudy rain 3 2006-04-01 03:00:00.000 +0200 Partly Cloudy rain 4 2006-04-01 04:00:00.000 +0200 Mostly Cloudy rain 96448 2016-09-09 19:00:00.000 +0200 Partly Cloudy rain 2016-09-09 20:00:00.000 +0200 Partly Cloudy 96449 rain 96450 2016-09-09 21:00:00.000 +0200 Partly Cloudy rain 96451 2016-09-09 22:00:00.000 +0200 Partly Cloudy rain 96452 2016-09-09 23:00:00.000 +0200 Partly Cloudy rain Apparent Temperature (C) Humidity Wind Speed (km/h) Temperature (C) 0 0.89 9.472222 7.388889 14.1197 0.86 1 9.355556 7.227778 14.2646 2 9.377778 9.377778 0.89 3.9284 3 8.288889 5.944444 0.83 14.1036 4 6.977778 11.0446 8.755556 0.83 96448 26.016667 26.016667 0.43 10.9963 24.583333 0.48 10.0947 96449 24.583333 96450 22.038889 22.038889 0.56 8.9838 96451 21.522222 21.522222 0.60 10.5294 96452 20.438889 20.438889 0.61 5.8765 Loud Cover Wind Bearing (degrees) Visibility (km) 0 251.0 15.8263 0.0 1 259.0 0.0 15.8263 2 204.0 14.9569 0.0 3 0.0 269.0 15.8263 4 259.0 15.8263 0.0 96448 31.0 16.1000 0.0 20.0 0.0 96449 15.5526 96450 30.0 16.1000 0.0 96451 20.0 0.0 16.1000 96452 39.0 15.5204 0.0

Daily Summary

```
0
                    1015.13
                                  Partly cloudy throughout the day.
1
                    1015.63
                                  Partly cloudy throughout the day.
                                  Partly cloudy throughout the day.
2
                    1015.94
3
                                  Partly cloudy throughout the day.
                    1016.41
                                  Partly cloudy throughout the day.
4
                    1016.51
                    1014.36 Partly cloudy starting in the morning.
96448
96449
                    1015.16 Partly cloudy starting in the morning.
                    1015.66 Partly cloudy starting in the morning.
96450
96451
                    1015.95 Partly cloudy starting in the morning.
                    1016.16 Partly cloudy starting in the morning.
96452
```

[76534 rows x 12 columns]

```
[49]: #check null values
df.isna() #returns True (Nan) False(Not NaN)
```

| [49]: | Formatted Date | Summarv | Precip Type | e Temperature (C | 2) \ |
|-------|-----------------|-----------|--------------|------------------|-------|
| 0 | False | False | False | - | |
| 1 | False | False | False | | |
| 2 | False | False | False | | |
| 3 | False | False | False | | |
| 4 | False | False | False | | |
| ••• | ••• | | *** | | |
| 96448 | False | False | False | e Fals | е |
| 96449 | False | False | False | | |
| 96450 | False | False | False | | |
| 96451 | False | False | False | | |
| 96452 | False | False | False | | |
| | | | | | |
| | Apparent Temper | ature (C) | Humidity | Wind Speed (km/h | .) \ |
| 0 | | False | False | Fals | е |
| 1 | | False | False | Fals | е |
| 2 | | False | False | Fals | е |
| 3 | | False | False | Fals | е |
| 4 | | False | False | Fals | е |
| ••• | | ••• | ••• | ••• | |
| 96448 | | False | False | Fals | е |
| 96449 | | False | False | Fals | е |
| 96450 | | False | False | Fals | е |
| 96451 | | False | False | Fals | е |
| 96452 | | False | False | Fals | е |
| | | | | | |
| | Wind Bearing (d | • | Visibility (| (km) Pressure (m | |
| 0 | | False | | alse | False |
| 1 | | False | Fa | alse | False |
| 2 | | False | Fa | alse | False |

```
4
                               False
                                                 False
                                                                        False
      96448
                                                                        False
                               False
                                                 False
      96449
                               False
                                                 False
                                                                        False
      96450
                               False
                                                 False
                                                                        False
      96451
                               False
                                                 False
                                                                        False
      96452
                               False
                                                 False
                                                                        False
             Daily Summary
      0
                      False
      1
                      False
      2
                      False
      3
                      False
      4
                      False
      96448
                      False
      96449
                      False
                      False
      96450
      96451
                      False
      96452
                      False
      [96453 rows x 11 columns]
[50]: df.isna().sum()
[50]: Formatted Date
                                     0
      Summary
                                     0
      Precip Type
                                   517
      Temperature (C)
                                     0
      Apparent Temperature (C)
                                     0
      Humidity
                                     0
      Wind Speed (km/h)
                                     0
      Wind Bearing (degrees)
                                     0
      Visibility (km)
                                     0
      Pressure (millibars)
                                     0
      Daily Summary
                                     0
      dtype: int64
[51]: #show me rows of all the nan values of the columns Precip Type
      df[df['Precip Type'].isna()==True]
[51]:
                             Formatted Date
                                                    Summary Precip Type \
      52672 2012-04-11 16:00:00.000 +0200
                                             Mostly Cloudy
                                                                     {\tt NaN}
      52674 2012-04-11 18:00:00.000 +0200
                                             Mostly Cloudy
                                                                     NaN
                                             Mostly Cloudy
      52675
             2012-04-11 19:00:00.000 +0200
                                                                     {\tt NaN}
      52677 2012-04-11 21:00:00.000 +0200
                                              Mostly Cloudy
                                                                     NaN
```

False

False

False

3

```
52678 2012-04-11 22:00:00.000 +0200
                                       Mostly Cloudy
                                                              NaN
                                             •••
95584
       2016-10-31 19:00:00.000 +0100
                                       Mostly Cloudy
                                                              NaN
       2016-10-31 20:00:00.000 +0100
95585
                                       Mostly Cloudy
                                                              NaN
95586
       2016-10-31 21:00:00.000 +0100
                                       Mostly Cloudy
                                                              NaN
       2016-10-31 22:00:00.000 +0100
                                       Partly Cloudy
95587
                                                              NaN
       2016-10-31 23:00:00.000 +0100
                                       Mostly Cloudy
                                                              NaN
95588
                        Apparent Temperature (C)
                                                   Humidity Wind Speed (km/h) \
       Temperature (C)
52672
             19.016667
                                        19.016667
                                                        0.26
                                                                        14.8764
                                                        0.28
52674
             17.850000
                                        17.850000
                                                                        13.7977
52675
             16.322222
                                        16.322222
                                                        0.32
                                                                        10.8192
52677
             12.566667
                                        12.566667
                                                        0.43
                                                                         9.0160
52678
             12.927778
                                        12.927778
                                                        0.47
                                                                        17.6295
95584
              8.322222
                                         7.044444
                                                        0.85
                                                                         8.0339
                                                        0.87
95585
              7.627778
                                         6.183333
                                                                         8.2271
              7.111111
                                                        0.89
                                                                         8.5008
95586
                                         5.511111
95587
              6.672222
                                         4.961111
                                                        0.90
                                                                         8.6457
95588
              6.322222
                                         4.588889
                                                        0.91
                                                                         8.4686
       Wind Bearing (degrees) Visibility (km) Pressure (millibars)
52672
                         163.0
                                          9.982
                                                               1002.40
52674
                         169.0
                                          9.982
                                                               1001.79
52675
                         151.0
                                                               1001.60
                                          9.982
52677
                         159.0
                                          9.982
                                                               1001.92
                         197.0
                                                               1002.20
52678
                                         16.100
95584
                         290.0
                                          0.000
                                                               1021.73
95585
                         293.0
                                          0.000
                                                               1021.76
95586
                         297.0
                                          0.000
                                                               1021.81
95587
                         299.0
                                          0.000
                                                               1021.83
                         299.0
                                          0.000
95588
                                                               1021.80
                                   Daily Summary
52672
                     Mostly cloudy until night.
52674
                     Mostly cloudy until night.
52675
                     Mostly cloudy until night.
                     Mostly cloudy until night.
52677
                     Mostly cloudy until night.
52678
95584 Mostly cloudy starting in the afternoon.
95585 Mostly cloudy starting in the afternoon.
95586
      Mostly cloudy starting in the afternoon.
95587
       Mostly cloudy starting in the afternoon.
95588 Mostly cloudy starting in the afternoon.
```

[517 rows x 11 columns]

```
[52]: df_clean1=df[df['Precip Type'].isna()==False]
[53]: #drop all the null values
      df.dropna()
[53]:
                             Formatted Date
                                                     Summary Precip Type
      0
              2006-04-01 00:00:00.000 +0200
                                              Partly Cloudy
                                                                     rain
             2006-04-01 01:00:00.000 +0200
                                              Partly Cloudy
      1
                                                                     rain
      2
              2006-04-01 02:00:00.000 +0200
                                              Mostly Cloudy
                                                                     rain
      3
              2006-04-01 03:00:00.000 +0200
                                              Partly Cloudy
                                                                     rain
      4
              2006-04-01 04:00:00.000 +0200
                                              Mostly Cloudy
                                                                     rain
             2016-09-09 19:00:00.000 +0200
                                              Partly Cloudy
      96448
                                                                     rain
      96449
             2016-09-09 20:00:00.000 +0200
                                              Partly Cloudy
                                                                     rain
      96450
             2016-09-09 21:00:00.000 +0200
                                              Partly Cloudy
                                                                     rain
              2016-09-09 22:00:00.000 +0200
      96451
                                              Partly Cloudy
                                                                     rain
      96452
             2016-09-09 23:00:00.000 +0200
                                              Partly Cloudy
                                                                     rain
             Temperature (C)
                                Apparent Temperature (C)
                                                           Humidity
                                                                      Wind Speed (km/h)
      0
                                                                0.89
                     9.472222
                                                 7.388889
                                                                                 14.1197
      1
                     9.355556
                                                 7.227778
                                                                0.86
                                                                                 14.2646
      2
                     9.377778
                                                 9.377778
                                                               0.89
                                                                                  3.9284
      3
                     8.288889
                                                 5.944444
                                                                0.83
                                                                                 14.1036
      4
                     8.755556
                                                 6.977778
                                                                0.83
                                                                                 11.0446
      96448
                    26.016667
                                                26.016667
                                                                0.43
                                                                                 10.9963
                    24.583333
                                                24.583333
      96449
                                                                0.48
                                                                                 10.0947
      96450
                    22.038889
                                                22.038889
                                                                0.56
                                                                                  8.9838
      96451
                    21.522222
                                                21.522222
                                                                0.60
                                                                                 10.5294
      96452
                    20.438889
                                                20.438889
                                                                0.61
                                                                                  5.8765
                                                         Pressure (millibars)
             Wind Bearing (degrees)
                                       Visibility (km)
      0
                                251.0
                                                15.8263
                                                                       1015.13
      1
                                259.0
                                                15.8263
                                                                       1015.63
      2
                                204.0
                                                14.9569
                                                                       1015.94
      3
                                269.0
                                                15.8263
                                                                       1016.41
      4
                                259.0
                                                15.8263
                                                                       1016.51
      96448
                                 31.0
                                                16.1000
                                                                       1014.36
      96449
                                 20.0
                                                15.5526
                                                                       1015.16
      96450
                                 30.0
                                                16.1000
                                                                       1015.66
      96451
                                 20.0
                                                                       1015.95
                                                16.1000
                                 39.0
      96452
                                                15.5204
                                                                       1016.16
```

Daily Summary

```
0
                  Partly cloudy throughout the day.
      1
                  Partly cloudy throughout the day.
                  Partly cloudy throughout the day.
      2
                  Partly cloudy throughout the day.
      3
      4
                  Partly cloudy throughout the day.
      96448 Partly cloudy starting in the morning.
      96449 Partly cloudy starting in the morning.
      96450 Partly cloudy starting in the morning.
      96451 Partly cloudy starting in the morning.
      96452 Partly cloudy starting in the morning.
      [95936 rows x 11 columns]
[54]: #duplicate rows
      df.duplicated().sum()
[54]: 24
[55]: df.drop_duplicates(keep='first',inplace=True)
[56]: df_clean1.isna().sum()
[56]: Formatted Date
                                  0
                                  0
      Summary
                                  0
      Precip Type
      Temperature (C)
                                  0
      Apparent Temperature (C)
                                  0
      Humidity
                                  0
      Wind Speed (km/h)
                                  0
     Wind Bearing (degrees)
                                  0
     Visibility (km)
                                  0
     Pressure (millibars)
                                  0
     Daily Summary
                                  0
      dtype: int64
```

Conclusion:

The data above is completely transformed and ready for further analysis