

```
In [1]: import pandas as pd

weather_data = pd.read_csv("weather.csv", encoding = "latin-1")

missing_values1 = weather_data.isnull().sum()

missing_values1
```

```
Out[1]: Location          0
Date            0
Minimum temperature (°C) 0
Maximum temperature (°C) 1
Rainfall (mm)      0
Evaporation (mm)   175
Sunshine (hours)    175
Direction of maximum wind gust 1
Speed of maximum wind gust (km/h) 1
Time of maximum wind gust       1
9am Temperature (°C)          0
9am relative humidity (%)     0
9am cloud amount (oktas)     175
9am wind direction           0
9am wind speed (km/h)        0
9am MSL pressure (hPa)       0
3pm Temperature (°C)         1
3pm relative humidity (%)    1
3pm cloud amount (oktas)    175
3pm wind direction           1
3pm wind speed (km/h)        1
3pm MSL pressure (hPa)       1
dtype: int64
```

```
In [2]: import pandas as pd

energy_data = pd.read_csv("price_and_demand.csv", encoding = "latin-1")

missing_values2 = energy_data.isnull().sum()

missing_values2
```

```
Out[2]: REGION          0
SETTLEMENTDATE  0
TOTALDEMAND     0
RRP             0
PERIODTYPE     0
dtype: int64
```

```
In [3]: import pandas as pd

# Import data, build dataframe
weather = pd.read_csv("weather.csv", encoding = "latin-1")
weather_df = pd.DataFrame(weather)

# Clean the empty columns.
column_to_drop1 = ["Evaporation (mm)", "Sunshine (hours)", "9am cloud amount (oktas)", "3pm c
weather_data_column_cleaned = weather_df.drop(columns = column_to_drop1)

# Clean the NA cell.
weather_data_cleaned = pd.DataFrame.copy(weather_data_column_cleaned.dropna())
weather_data_cleaned["9am wind speed (km/h)"].replace("Calm", 0, inplace = True)
weather_data_cleaned["9am wind direction"].replace(" ", "NA", inplace = True)

new_weather_dataframe = pd.DataFrame(weather_data_cleaned)

selected_columns = ["Date", "Minimum temperature (°C)", "Maximum temperature (°C)", "Rainfall
new_weather_dataframe = weather_data_cleaned[selected_columns].copy()
```

```
new_weather_dataframe[ 'Date' ] = pd.to_datetime(new_weather_dataframe[ 'Date' ], format='%d/%m/%Y')
new_weather_dataframe[ 'Date' ] = new_weather_dataframe[ 'Date' ].dt.strftime( '%Y-%m-%d' )

# Display the entire dataframe
pd.set_option("display.max_rows", None)

new_weather_dataframe
```

Out[3]:

	Date	Minimum temperature (°C)	Maximum temperature (°C)	Rainfall (mm)	Direction of maximum wind gust	Speed of maximum wind gust (km/h)	9am Temperature (°C)	9am relative humidity (%)	9am wind direction	9am wind speed (km/h)
0	2022-11-01	8.5	13.3	3.0	SW	44.0	12.0	64	NW	
1	2022-11-02	6.9	15.7	2.8	SSW	43.0	11.0	65	W	
2	2022-11-03	9.1	15.4	0.4	SSW	31.0	11.5	70	SSW	
3	2022-11-04	10.2	17.8	0.2	S	24.0	12.3	84	WSW	
4	2022-11-05	11.8	22.7	0.0	N	31.0	14.0	78	N	
5	2022-11-06	11.6	27.1	0.0	NNW	33.0	17.9	63	NNE	
6	2022-11-07	13.9	25.9	0.0	W	24.0	19.7	64	NE	
7	2022-11-08	14.6	27.6	0.0	NNW	35.0	21.8	57	N	
8	2022-11-09	15.6	29.3	2.8	NNE	35.0	20.8	67	N	
9	2022-11-10	19.8	26.4	0.0	NNW	54.0	23.8	50	N	
10	2022-11-11	18.7	20.2	3.0	SSW	30.0	18.7	80	SSW	
11	2022-11-12	14.2	19.3	0.0	SSW	26.0	15.7	69	SSE	
12	2022-11-13	15.4	24.8	6.6	N	44.0	19.1	88	NNE	
13	2022-11-14	13.0	17.4	13.6	SSW	41.0	15.3	78	N	
14	2022-11-15	8.0	13.1	14.2	SW	43.0	10.1	72	W	
15	2022-11-16	7.2	14.8	0.6	S	43.0	11.0	64	WSW	
16	2022-11-17	9.6	16.3	3.2	SSW	33.0	13.1	71	SSW	
17	2022-11-18	7.2	24.5	0.0	NNW	28.0	12.5	70	NE	
18	2022-11-19	12.5	22.3	0.0	N	59.0	19.3	52	NE	
19	2022-11-20	11.8	20.6	16.0	NNW	50.0	14.3	63	NW	
20	2022-11-21	9.4	13.8	1.2	W	57.0	11.2	51	NW	
21	2022-11-22	8.7	18.2	2.0	WNW	37.0	12.7	68	WNW	
22	2022-11-23	11.6	17.7	0.6	SSW	30.0	14.7	65	W	

	Date	Minimum temperature (°C)	Maximum temperature (°C)	Rainfall (mm)	Direction of maximum wind gust	Speed of maximum wind gust (km/h)	9am Temperature (°C)	9am relative humidity (%)	9am wind direction	9am wind speed (km/h)
23	2022-11-24	12.4	19.2	2.8	SSE	22.0	14.3	73	W	
24	2022-11-25	11.6	20.6	0.0	S	22.0	14.3	75	SW	
25	2022-11-26	10.9	27.3	0.0	N	54.0	16.8	66	NE	
26	2022-11-27	14.7	20.5	0.2	SSW	37.0	16.0	71	SW	
27	2022-11-28	9.7	18.8	0.2	NW	31.0	14.0	61	NW	
28	2022-11-29	12.2	18.4	0.4	S	33.0	15.5	65	WSW	
29	2022-11-30	11.6	18.4	0.0	SSW	31.0	16.0	58	SSE	
30	2022-12-01	12.1	18.8	0.0	S	35.0	17.0	73	ESE	
31	2022-12-02	9.4	21.4	0.0	SSW	26.0	15.0	74	N	
32	2022-12-03	13.6	31.0	0.0	NNW	31.0	21.3	68	NE	
33	2022-12-04	17.3	34.5	0.0	NW	44.0	27.2	43	NNE	
34	2022-12-05	16.2	18.1	0.0	SSW	52.0	16.6	77	SSW	
35	2022-12-06	13.4	20.0	1.2	S	31.0	15.5	71	SE	
36	2022-12-07	13.1	19.3	0.2	SW	41.0	16.4	68	S	
37	2022-12-08	9.4	16.0	0.6	S	48.0	10.8	72	WSW	
38	2022-12-09	9.9	17.6	2.4	S	41.0	14.6	44	SSE	
39	2022-12-10	8.1	25.9	0.0	N	31.0	14.2	63	NW	
40	2022-12-11	14.0	28.6	0.0	N	54.0	20.7	53	NNE	
41	2022-12-12	11.5	17.3	17.4	NW	44.0	12.6	84	WNW	
42	2022-12-13	11.6	17.9	3.2	NNW	44.0	14.2	56	NNW	
43	2022-12-14	9.0	15.8	6.2	S	50.0	13.7	64	S	
44	2022-12-15	11.1	16.6	3.4	S	39.0	14.8	58	SSE	
45	2022-12-16	10.8	20.3	0.0	SE	35.0	15.7	58	SE	

	Date	Minimum temperature (°C)	Maximum temperature (°C)	Rainfall (mm)	Direction of maximum wind gust	Speed of maximum wind gust (km/h)	9am Temperature (°C)	9am relative humidity (%)	9am wind direction	9am wind speed (km/h)
46	2022-12-17	10.9	22.3	0.2	SSE	41.0	16.5	61	SE	
47	2022-12-18	11.7	23.7	0.0	ESE	37.0	16.5	54	ESE	
48	2022-12-19	9.8	26.0	0.0	SSE	33.0	16.6	67	WSW	
49	2022-12-20	10.2	27.3	0.0	SSE	31.0	16.4	64	NE	
50	2022-12-21	12.9	29.4	0.0	NNE	30.0	18.2	64	NNE	
51	2022-12-22	16.8	25.2	5.2	N	26.0	17.4	91	ENE	
52	2022-12-23	15.7	23.1	1.6	SW	28.0	18.2	97	S	
53	2022-12-24	16.7	23.5	0.0	S	31.0	18.9	66	SW	
54	2022-12-25	12.9	31.9	0.0	SSW	24.0	19.5	66	ENE	
55	2022-12-26	17.0	27.5	0.0	SSW	28.0	22.6	58	NNE	
56	2022-12-27	17.7	37.3	0.0	N	33.0	25.1	62	ENE	
57	2022-12-28	25.0	27.6	0.0	N	46.0	27.6	42	W	
58	2022-12-29	14.0	19.3	0.8	SSE	33.0	15.8	58	SSE	
59	2022-12-30	12.6	26.2	0.0	SSW	30.0	18.2	70	ENE	
60	2022-12-31	17.9	30.3	0.0	SSE	30.0	20.6	78	NNE	
61	2023-01-01	18.4	35.9	0.0	N	31.0	24.6	65	NNE	
62	2023-01-02	22.1	32.0	6.4	N	52.0	28.6	47	N	
63	2023-01-03	15.2	21.1	0.2	S	37.0	17.4	68	SSE	
64	2023-01-04	15.0	18.7	0.0	SW	52.0	15.6	62	SSW	
65	2023-01-05	14.1	21.6	1.0	S	39.0	18.4	66	SE	
66	2023-01-06	13.3	25.6	0.0	ESE	37.0	18.4	65	ESE	
67	2023-01-07	13.2	30.2	0.0	SSE	28.0	18.5	66	NE	
68	2023-01-08	14.9	31.9	0.0	SE	24.0	20.3	67	NE	

	Date	Minimum temperature (°C)	Maximum temperature (°C)	Rainfall (mm)	Direction of maximum wind gust	Speed of maximum wind gust (km/h)	9am Temperature (°C)	9am relative humidity (%)	9am wind direction	9am wind speed (km/h)
69	2023-01-09	18.4	26.2	0.0	SSW	37.0	24.3	46	S	
70	2023-01-10	16.9	21.6	0.0	SSW	35.0	17.4	66	SSE	
71	2023-01-11	15.9	29.9	0.0	SSW	28.0	20.4	71	NE	
72	2023-01-12	18.7	24.0	0.0	SSW	28.0	18.7	87	WSW	
73	2023-01-13	18.0	24.2	0.0	S	31.0	20.4	76	SSW	
74	2023-01-14	20.2	37.6	0.0	NNW	43.0	23.3	75	NE	
75	2023-01-15	18.0	20.6	0.0	SSW	35.0	18.4	72	S	
76	2023-01-16	15.1	27.0	0.0	SSW	24.0	16.4	72	NE	
77	2023-01-17	16.3	37.2	0.0	NW	48.0	26.3	54	N	
78	2023-01-18	19.8	19.9	6.0	S	41.0	19.9	94	SW	
79	2023-01-19	14.7	19.3	4.6	SSW	41.0	16.3	56	S	
80	2023-01-20	15.5	21.0	0.0	SSW	35.0	17.5	50	ESE	
81	2023-01-21	13.8	23.0	0.0	SSW	43.0	17.2	76	NW	
82	2023-01-22	17.2	23.4	0.0	SSW	35.0	20.0	72	SE	
83	2023-01-23	18.2	28.0	0.0	S	24.0	20.1	69	NW	
84	2023-01-24	17.6	28.6	0.0	SSW	41.0	20.4	66	NNE	
85	2023-01-25	17.2	30.0	1.8	SSW	35.0	20.3	77	NNE	
86	2023-01-26	15.9	21.6	0.0	SSW	35.0	18.4	69	SSW	
87	2023-01-27	13.5	26.8	0.0	S	24.0	17.1	59	E	
88	2023-01-28	15.2	34.2	0.0	N	43.0	25.5	32	N	
89	2023-01-29	19.5	23.8	0.2	SSW	24.0	20.7	84	NA	
90	2023-01-30	17.9	21.7	0.0	S	33.0	18.3	71	S	
91	2023-01-31	15.6	22.2	0.0	S	30.0	18.7	67	SE	

	Date	Minimum temperature (°C)	Maximum temperature (°C)	Rainfall (mm)	Direction of maximum wind gust	Speed of maximum wind gust (km/h)	9am Temperature (°C)	9am relative humidity (%)	9am wind direction	9am wind speed (km/h)
92	2023-02-01	14.9	21.0	0.0	SSW	39.0	18.1	61	WSW	
93	2023-02-02	14.2	21.3	0.2	NNW	56.0	15.6	47	NW	
94	2023-02-03	11.4	18.8	11.2	WSW	41.0	13.4	61	NNW	
95	2023-02-04	11.7	20.7	6.6	SSW	31.0	14.8	86	WNW	
96	2023-02-05	13.8	19.8	1.2	SSE	26.0	16.5	69	W	
97	2023-02-06	16.0	20.9	0.0	SSW	28.0	16.8	75	W	
98	2023-02-07	16.6	20.4	0.0	SSW	37.0	17.5	64	SSE	
99	2023-02-08	15.0	22.2	0.0	S	33.0	17.6	64	S	
100	2023-02-09	13.2	26.4	0.2	SSW	26.0	17.5	79	ENE	
101	2023-02-10	16.2	26.7	0.0	SSW	28.0	19.0	85	NA	
102	2023-02-11	15.8	25.7	0.0	SSW	41.0	20.2	79	NA	
103	2023-02-12	17.3	20.7	0.0	S	46.0	18.6	65	WSW	
104	2023-02-13	15.8	20.9	0.0	SSW	37.0	17.1	55	SSE	
105	2023-02-14	12.0	22.2	0.0	SSW	37.0	17.1	67	ESE	
106	2023-02-15	12.6	32.4	0.0	N	31.0	17.2	71	NNE	
107	2023-02-16	17.1	37.2	0.0	NNW	33.0	23.1	55	NE	
108	2023-02-17	22.8	40.5	0.0	NNW	46.0	29.9	33	N	
109	2023-02-18	17.4	24.9	0.0	SSW	31.0	18.1	68	SSW	
110	2023-02-19	14.9	27.9	0.0	S	30.0	19.3	71	SE	
111	2023-02-20	14.9	24.0	0.0	SSW	30.0	18.6	83	NA	
112	2023-02-21	17.7	22.2	0.0	SSE	39.0	18.3	70	SSE	
113	2023-02-22	14.6	30.6	0.0	SSE	33.0	17.6	67	NA	
114	2023-02-23	17.5	32.4	0.0	N	44.0	21.6	45	N	

	Date	Minimum temperature (°C)	Maximum temperature (°C)	Rainfall (mm)	Direction of maximum wind gust	Speed of maximum wind gust (km/h)	9am Temperature (°C)	9am relative humidity (%)	9am wind direction	9am wind speed (km/h)
115	2023-02-24	19.6	32.3	0.0	NNW	46.0	23.1	48	N	
116	2023-02-25	22.2	26.7	0.0	N	28.0	25.0	37	N	
117	2023-02-26	15.7	23.4	1.4	SSW	30.0	17.1	68	NA	
118	2023-02-27	16.3	20.2	2.6	SSW	33.0	17.9	77	S	
119	2023-02-28	16.5	17.6	0.2	SSW	28.0	17.1	72	SSE	
120	2023-03-01	14.3	21.1	3.2	SSW	28.0	14.9	94	W	
121	2023-03-02	14.5	21.7	0.8	SSW	26.0	16.1	73	WSW	
122	2023-03-03	15.5	19.8	0.2	SSW	35.0	16.6	65	SE	
123	2023-03-04	14.1	31.4	0.0	NNE	31.0	16.8	76	NE	
124	2023-03-05	16.5	32.9	0.0	NNW	44.0	23.2	57	N	
125	2023-03-06	15.5	25.3	5.6	NNW	50.0	17.4	63	NW	
126	2023-03-07	15.4	23.2	0.0	NNW	50.0	16.7	55	NNW	
127	2023-03-08	12.3	19.4	1.0	NW	48.0	13.4	62	NW	
128	2023-03-09	12.9	22.1	0.0	W	31.0	14.5	63	WNW	
129	2023-03-10	14.5	24.0	0.0	SSE	28.0	17.1	68	NW	
130	2023-03-11	13.3	24.7	0.0	SSW	31.0	16.4	86	NA	
131	2023-03-12	15.5	20.7	0.0	SSW	37.0	17.4	67	SSE	
132	2023-03-13	11.7	22.4	0.0	S	30.0	16.4	68	S	
133	2023-03-14	15.9	30.5	0.0	NNW	31.0	17.6	81	NNE	
134	2023-03-15	17.6	22.9	0.0	SSW	24.0	19.0	81	SSW	
135	2023-03-16	17.3	28.5	0.0	WSW	39.0	18.6	63	W	
136	2023-03-17	15.8	24.6	2.6	SSW	28.0	16.8	64	W	
137	2023-03-18	14.6	36.2	0.0	N	52.0	23.1	43	N	

	Date	Minimum temperature (°C)	Maximum temperature (°C)	Rainfall (mm)	Direction of maximum wind gust	Speed of maximum wind gust (km/h)	9am Temperature (°C)	9am relative humidity (%)	9am wind direction	9am wind speed (km/h)
138	2023-03-19	17.3	19.0	0.0	SSW	28.0	17.4	74	SSE	
139	2023-03-20	14.9	20.8	0.0	SSW	41.0	15.7	56	SE	
140	2023-03-21	11.7	19.4	0.0	ESE	17.0	13.5	70	NNE	
141	2023-03-22	13.5	22.8	1.6	SSW	24.0	17.3	86	NE	
142	2023-03-23	15.3	22.6	10.2	WNW	24.0	16.5	100	S	
143	2023-03-24	16.1	21.6	1.4	SSE	31.0	17.3	74	SSE	
144	2023-03-25	11.6	19.6	0.2	S	33.0	15.7	69	SE	
145	2023-03-26	10.7	19.9	0.0	S	20.0	14.0	74	NA	
146	2023-03-27	13.9	18.3	0.0	N	26.0	16.0	84	NNW	
147	2023-03-28	15.5	20.9	8.0	SSW	24.0	16.7	95	NA	
148	2023-03-29	14.9	18.5	5.8	S	43.0	14.9	91	SSW	
149	2023-03-30	12.4	19.1	8.2	WSW	31.0	14.3	69	W	
150	2023-03-31	14.1	19.4	0.0	S	33.0	15.2	71	WNW	
151	2023-04-01	11.3	16.4	4.6	SSE	33.0	13.3	74	SE	
152	2023-04-02	8.7	18.3	0.2	S	22.0	13.3	68	NE	
153	2023-04-03	8.8	22.6	0.0	SSW	19.0	13.3	78	NE	
154	2023-04-04	12.0	21.7	0.0	SSW	28.0	16.6	81	N	
155	2023-04-05	13.8	18.4	0.0	SSW	22.0	16.8	76	SSE	
156	2023-04-06	13.4	26.3	0.0	NNW	43.0	17.0	79	NE	
157	2023-04-07	16.1	19.9	4.4	N	41.0	17.9	71	NNW	
158	2023-04-08	13.7	18.0	11.2	SW	35.0	14.9	79	W	
159	2023-04-09	10.5	15.5	7.8	SSW	43.0	11.7	84	W	
160	2023-04-10	10.1	15.2	14.8	S	35.0	13.4	70	S	

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161	2023-04-11	11.9	19.1	6.0	SSW	19.0	14.7	81	ESE	
162	2023-04-12	12.6	19.3	7.0	N	41.0	13.3	88	N	
163	2023-04-13	11.2	22.8	4.4	E	28.0	15.3	89	SSW	
164	2023-04-14	10.8	25.4	0.0	NNW	20.0	14.1	93	NE	
165	2023-04-15	13.8	21.2	0.0	NNW	54.0	20.6	51	N	
166	2023-04-16	12.1	17.2	38.4	SSW	35.0	12.7	93	WSW	
167	2023-04-17	8.7	20.7	2.0	N	24.0	14.8	66	N	
168	2023-04-18	13.4	22.8	0.0	NNW	35.0	16.8	70	NNE	
169	2023-04-19	14.4	17.5	1.2	SW	28.0	14.8	66	WSW	
170	2023-04-20	7.8	18.5	0.0	SSW	17.0	12.4	72	NNE	
171	2023-04-21	11.3	19.0	0.0	SSW	13.0	14.8	78	NE	
172	2023-04-22	14.6	19.2	0.0	SSW	22.0	15.2	84	SW	
173	2023-04-23	14.8	19.0	0.0	SSW	26.0	16.7	79	SSE	

In [4]: # Check the data again

```
import pandas as pd

missing_values3 = weather_data_cleaned.isnull().sum()

missing_values3
```

Out[4]:

Location	0
Date	0
Minimum temperature (°C)	0
Maximum temperature (°C)	0
Rainfall (mm)	0
Direction of maximum wind gust	0
Speed of maximum wind gust (km/h)	0
Time of maximum wind gust	0
9am Temperature (°C)	0
9am relative humidity (%)	0
9am wind direction	0
9am wind speed (km/h)	0
9am MSL pressure (hPa)	0
3pm Temperature (°C)	0
3pm relative humidity (%)	0
3pm wind direction	0
3pm wind speed (km/h)	0
3pm MSL pressure (hPa)	0

dtype: int64

```
In [5]: selected_columns = ["Date", "Minimum temperature (°C)", "Maximum temperature (°C)", "Rainfall  
weather_dataframe = new_weather_dataframe[selected_columns]  
weather_dataframe
```

Out[5]:

	Date	Minimum temperature (°C)	Maximum temperature (°C)	Rainfall (mm)	Direction of maximum wind gust	Speed of maximum wind gust (km/h)
0	2022-11-01	8.5	13.3	3.0	SW	44.0
1	2022-11-02	6.9	15.7	2.8	SSW	43.0
2	2022-11-03	9.1	15.4	0.4	SSW	31.0
3	2022-11-04	10.2	17.8	0.2	S	24.0
4	2022-11-05	11.8	22.7	0.0	N	31.0
5	2022-11-06	11.6	27.1	0.0	NNW	33.0
6	2022-11-07	13.9	25.9	0.0	W	24.0
7	2022-11-08	14.6	27.6	0.0	NNW	35.0
8	2022-11-09	15.6	29.3	2.8	NNE	35.0
9	2022-11-10	19.8	26.4	0.0	NNW	54.0
10	2022-11-11	18.7	20.2	3.0	SSW	30.0
11	2022-11-12	14.2	19.3	0.0	SSW	26.0
12	2022-11-13	15.4	24.8	6.6	N	44.0
13	2022-11-14	13.0	17.4	13.6	SSW	41.0
14	2022-11-15	8.0	13.1	14.2	SW	43.0
15	2022-11-16	7.2	14.8	0.6	S	43.0
16	2022-11-17	9.6	16.3	3.2	SSW	33.0
17	2022-11-18	7.2	24.5	0.0	NNW	28.0
18	2022-11-19	12.5	22.3	0.0	N	59.0
19	2022-11-20	11.8	20.6	16.0	NNW	50.0
20	2022-11-21	9.4	13.8	1.2	W	57.0
21	2022-11-22	8.7	18.2	2.0	WNW	37.0
22	2022-11-23	11.6	17.7	0.6	SSW	30.0
23	2022-11-24	12.4	19.2	2.8	SSE	22.0

	Date	Minimum temperature (°C)	Maximum temperature (°C)	Rainfall (mm)	Direction of maximum wind gust	Speed of maximum wind gust (km/h)
24	2022-11-25	11.6	20.6	0.0	S	22.0
25	2022-11-26	10.9	27.3	0.0	N	54.0
26	2022-11-27	14.7	20.5	0.2	SSW	37.0
27	2022-11-28	9.7	18.8	0.2	NW	31.0
28	2022-11-29	12.2	18.4	0.4	S	33.0
29	2022-11-30	11.6	18.4	0.0	SSW	31.0
30	2022-12-01	12.1	18.8	0.0	S	35.0
31	2022-12-02	9.4	21.4	0.0	SSW	26.0
32	2022-12-03	13.6	31.0	0.0	NNW	31.0
33	2022-12-04	17.3	34.5	0.0	NW	44.0
34	2022-12-05	16.2	18.1	0.0	SSW	52.0
35	2022-12-06	13.4	20.0	1.2	S	31.0
36	2022-12-07	13.1	19.3	0.2	SW	41.0
37	2022-12-08	9.4	16.0	0.6	S	48.0
38	2022-12-09	9.9	17.6	2.4	S	41.0
39	2022-12-10	8.1	25.9	0.0	N	31.0
40	2022-12-11	14.0	28.6	0.0	N	54.0
41	2022-12-12	11.5	17.3	17.4	NW	44.0
42	2022-12-13	11.6	17.9	3.2	NNW	44.0
43	2022-12-14	9.0	15.8	6.2	S	50.0
44	2022-12-15	11.1	16.6	3.4	S	39.0
45	2022-12-16	10.8	20.3	0.0	SE	35.0
46	2022-12-17	10.9	22.3	0.2	SSE	41.0
47	2022-12-18	11.7	23.7	0.0	ESE	37.0

	Date	Minimum temperature (°C)	Maximum temperature (°C)	Rainfall (mm)	Direction of maximum wind gust	Speed of maximum wind gust (km/h)
48	2022-12-19	9.8	26.0	0.0	SSE	33.0
49	2022-12-20	10.2	27.3	0.0	SSE	31.0
50	2022-12-21	12.9	29.4	0.0	NNE	30.0
51	2022-12-22	16.8	25.2	5.2	N	26.0
52	2022-12-23	15.7	23.1	1.6	SW	28.0
53	2022-12-24	16.7	23.5	0.0	S	31.0
54	2022-12-25	12.9	31.9	0.0	SSW	24.0
55	2022-12-26	17.0	27.5	0.0	SSW	28.0
56	2022-12-27	17.7	37.3	0.0	N	33.0
57	2022-12-28	25.0	27.6	0.0	N	46.0
58	2022-12-29	14.0	19.3	0.8	SSE	33.0
59	2022-12-30	12.6	26.2	0.0	SSW	30.0
60	2022-12-31	17.9	30.3	0.0	SSE	30.0
61	2023-01-01	18.4	35.9	0.0	N	31.0
62	2023-01-02	22.1	32.0	6.4	N	52.0
63	2023-01-03	15.2	21.1	0.2	S	37.0
64	2023-01-04	15.0	18.7	0.0	SW	52.0
65	2023-01-05	14.1	21.6	1.0	S	39.0
66	2023-01-06	13.3	25.6	0.0	ESE	37.0
67	2023-01-07	13.2	30.2	0.0	SSE	28.0
68	2023-01-08	14.9	31.9	0.0	SE	24.0
69	2023-01-09	18.4	26.2	0.0	SSW	37.0
70	2023-01-10	16.9	21.6	0.0	SSW	35.0
71	2023-01-11	15.9	29.9	0.0	SSW	28.0

	Date	Minimum temperature (°C)	Maximum temperature (°C)	Rainfall (mm)	Direction of maximum wind gust	Speed of maximum wind gust (km/h)
72	2023-01-12	18.7	24.0	0.0	SSW	28.0
73	2023-01-13	18.0	24.2	0.0	S	31.0
74	2023-01-14	20.2	37.6	0.0	NNW	43.0
75	2023-01-15	18.0	20.6	0.0	SSW	35.0
76	2023-01-16	15.1	27.0	0.0	SSW	24.0
77	2023-01-17	16.3	37.2	0.0	NW	48.0
78	2023-01-18	19.8	19.9	6.0	S	41.0
79	2023-01-19	14.7	19.3	4.6	SSW	41.0
80	2023-01-20	15.5	21.0	0.0	SSW	35.0
81	2023-01-21	13.8	23.0	0.0	SSW	43.0
82	2023-01-22	17.2	23.4	0.0	SSW	35.0
83	2023-01-23	18.2	28.0	0.0	S	24.0
84	2023-01-24	17.6	28.6	0.0	SSW	41.0
85	2023-01-25	17.2	30.0	1.8	SSW	35.0
86	2023-01-26	15.9	21.6	0.0	SSW	35.0
87	2023-01-27	13.5	26.8	0.0	S	24.0
88	2023-01-28	15.2	34.2	0.0	N	43.0
89	2023-01-29	19.5	23.8	0.2	SSW	24.0
90	2023-01-30	17.9	21.7	0.0	S	33.0
91	2023-01-31	15.6	22.2	0.0	S	30.0
92	2023-02-01	14.9	21.0	0.0	SSW	39.0
93	2023-02-02	14.2	21.3	0.2	NNW	56.0
94	2023-02-03	11.4	18.8	11.2	WSW	41.0
95	2023-02-04	11.7	20.7	6.6	SSW	31.0

	Date	Minimum temperature (°C)	Maximum temperature (°C)	Rainfall (mm)	Direction of maximum wind gust	Speed of maximum wind gust (km/h)
96	2023-02-05	13.8	19.8	1.2	SSE	26.0
97	2023-02-06	16.0	20.9	0.0	SSW	28.0
98	2023-02-07	16.6	20.4	0.0	SSW	37.0
99	2023-02-08	15.0	22.2	0.0	S	33.0
100	2023-02-09	13.2	26.4	0.2	SSW	26.0
101	2023-02-10	16.2	26.7	0.0	SSW	28.0
102	2023-02-11	15.8	25.7	0.0	SSW	41.0
103	2023-02-12	17.3	20.7	0.0	S	46.0
104	2023-02-13	15.8	20.9	0.0	SSW	37.0
105	2023-02-14	12.0	22.2	0.0	SSW	37.0
106	2023-02-15	12.6	32.4	0.0	N	31.0
107	2023-02-16	17.1	37.2	0.0	NNW	33.0
108	2023-02-17	22.8	40.5	0.0	NNW	46.0
109	2023-02-18	17.4	24.9	0.0	SSW	31.0
110	2023-02-19	14.9	27.9	0.0	S	30.0
111	2023-02-20	14.9	24.0	0.0	SSW	30.0
112	2023-02-21	17.7	22.2	0.0	SSE	39.0
113	2023-02-22	14.6	30.6	0.0	SSE	33.0
114	2023-02-23	17.5	32.4	0.0	N	44.0
115	2023-02-24	19.6	32.3	0.0	NNW	46.0
116	2023-02-25	22.2	26.7	0.0	N	28.0
117	2023-02-26	15.7	23.4	1.4	SSW	30.0
118	2023-02-27	16.3	20.2	2.6	SSW	33.0
119	2023-02-28	16.5	17.6	0.2	SSW	28.0

	Date	Minimum temperature (°C)	Maximum temperature (°C)	Rainfall (mm)	Direction of maximum wind gust	Speed of maximum wind gust (km/h)
120	2023-03-01	14.3	21.1	3.2	SSW	28.0
121	2023-03-02	14.5	21.7	0.8	SSW	26.0
122	2023-03-03	15.5	19.8	0.2	SSW	35.0
123	2023-03-04	14.1	31.4	0.0	NNE	31.0
124	2023-03-05	16.5	32.9	0.0	NNW	44.0
125	2023-03-06	15.5	25.3	5.6	NNW	50.0
126	2023-03-07	15.4	23.2	0.0	NNW	50.0
127	2023-03-08	12.3	19.4	1.0	NW	48.0
128	2023-03-09	12.9	22.1	0.0	W	31.0
129	2023-03-10	14.5	24.0	0.0	SSE	28.0
130	2023-03-11	13.3	24.7	0.0	SSW	31.0
131	2023-03-12	15.5	20.7	0.0	SSW	37.0
132	2023-03-13	11.7	22.4	0.0	S	30.0
133	2023-03-14	15.9	30.5	0.0	NNW	31.0
134	2023-03-15	17.6	22.9	0.0	SSW	24.0
135	2023-03-16	17.3	28.5	0.0	WSW	39.0
136	2023-03-17	15.8	24.6	2.6	SSW	28.0
137	2023-03-18	14.6	36.2	0.0	N	52.0
138	2023-03-19	17.3	19.0	0.0	SSW	28.0
139	2023-03-20	14.9	20.8	0.0	SSW	41.0
140	2023-03-21	11.7	19.4	0.0	ESE	17.0
141	2023-03-22	13.5	22.8	1.6	SSW	24.0
142	2023-03-23	15.3	22.6	10.2	WNW	24.0
143	2023-03-24	16.1	21.6	1.4	SSE	31.0

	Date	Minimum temperature (°C)	Maximum temperature (°C)	Rainfall (mm)	Direction of maximum wind gust	Speed of maximum wind gust (km/h)
144	2023-03-25	11.6	19.6	0.2	S	33.0
145	2023-03-26	10.7	19.9	0.0	S	20.0
146	2023-03-27	13.9	18.3	0.0	N	26.0
147	2023-03-28	15.5	20.9	8.0	SSW	24.0
148	2023-03-29	14.9	18.5	5.8	S	43.0
149	2023-03-30	12.4	19.1	8.2	WSW	31.0
150	2023-03-31	14.1	19.4	0.0	S	33.0
151	2023-04-01	11.3	16.4	4.6	SSE	33.0
152	2023-04-02	8.7	18.3	0.2	S	22.0
153	2023-04-03	8.8	22.6	0.0	SSW	19.0
154	2023-04-04	12.0	21.7	0.0	SSW	28.0
155	2023-04-05	13.8	18.4	0.0	SSW	22.0
156	2023-04-06	13.4	26.3	0.0	NNW	43.0
157	2023-04-07	16.1	19.9	4.4	N	41.0
158	2023-04-08	13.7	18.0	11.2	SW	35.0
159	2023-04-09	10.5	15.5	7.8	SSW	43.0
160	2023-04-10	10.1	15.2	14.8	S	35.0
161	2023-04-11	11.9	19.1	6.0	SSW	19.0
162	2023-04-12	12.6	19.3	7.0	N	41.0
163	2023-04-13	11.2	22.8	4.4	E	28.0
164	2023-04-14	10.8	25.4	0.0	NNW	20.0
165	2023-04-15	13.8	21.2	0.0	NNW	54.0
166	2023-04-16	12.1	17.2	38.4	SSW	35.0
167	2023-04-17	8.7	20.7	2.0	N	24.0

	Date	Minimum temperature (°C)	Maximum temperature (°C)	Rainfall (mm)	Direction of maximum wind gust	Speed of maximum wind gust (km/h)
168	2023-04-18	13.4	22.8	0.0	NNW	35.0
169	2023-04-19	14.4	17.5	1.2	SW	28.0
170	2023-04-20	7.8	18.5	0.0	SSW	17.0
171	2023-04-21	11.3	19.0	0.0	SSW	13.0
172	2023-04-22	14.6	19.2	0.0	SSW	22.0
173	2023-04-23	14.8	19.0	0.0	SSW	26.0

In [6]:

```
import pandas as pd

energy_demand = pd.read_csv("price_and_demand.csv", encoding = "latin-1")

missing_value4 = energy_demand.isnull().sum()
missing_value4
```

Out[6]:

```
REGION      0
SETTLEMENTDATE 0
TOTALDEMAND 0
RRP         0
PERIODTYPE 0
dtype: int64
```

In [7]:

```
import pandas as pd

data = pd.read_csv("price_and_demand.csv", encoding="latin-1")
totaldemand = pd.DataFrame(data)

grouped_totaldemand = totaldemand.groupby(totaldemand.index // 48).agg({'SETTLEMENTDATE': 'fi
grouped_totaldemand
```

Out[7]:

	SETTLEMENTDATE	TOTALDEMAND
0	1/11/2022 0:30	211901.76
1	2/11/2022 0:30	233820.15
2	3/11/2022 0:30	235757.80
3	4/11/2022 0:30	224741.55
4	5/11/2022 0:30	188763.75
5	6/11/2022 0:30	177545.00
6	7/11/2022 0:30	210882.69
7	8/11/2022 0:30	215055.25
8	9/11/2022 0:30	216311.19
9	10/11/2022 0:30	222407.58
10	11/11/2022 0:30	223766.52
11	12/11/2022 0:30	188037.61
12	13/11/2022 0:30	186450.69
13	14/11/2022 0:30	210249.26
14	15/11/2022 0:30	222929.51
15	16/11/2022 0:30	229488.59
16	17/11/2022 0:30	229492.69
17	18/11/2022 0:30	201630.49
18	19/11/2022 0:30	193603.58
19	20/11/2022 0:30	170247.19
20	21/11/2022 0:30	221642.42
21	22/11/2022 0:30	226308.18
22	23/11/2022 0:30	217645.81
23	24/11/2022 0:30	216516.55
24	25/11/2022 0:30	204648.00
25	26/11/2022 0:30	179835.07
26	27/11/2022 0:30	175277.76
27	28/11/2022 0:30	203457.19
28	29/11/2022 0:30	199068.66
29	30/11/2022 0:30	203541.68
30	1/12/2022 0:30	205941.30
31	2/12/2022 0:30	202255.43
32	3/12/2022 0:30	207232.32
33	4/12/2022 0:30	218784.81
34	5/12/2022 0:30	213657.54
35	6/12/2022 0:30	208853.77
36	7/12/2022 0:30	204581.10
37	8/12/2022 0:30	209312.78
38	9/12/2022 0:30	203747.71

	SETTLEMENTDATE	TOTALDEMAND
39	10/12/2022 0:30	183208.67
40	11/12/2022 0:30	195535.11
41	12/12/2022 0:30	207573.50
42	13/12/2022 0:30	216831.57
43	14/12/2022 0:30	213994.46
44	15/12/2022 0:30	210373.91
45	16/12/2022 0:30	197818.30
46	17/12/2022 0:30	171851.19
47	18/12/2022 0:30	159424.24
48	19/12/2022 0:30	192147.24
49	20/12/2022 0:30	199573.40
50	21/12/2022 0:30	214232.67
51	22/12/2022 0:30	221856.58
52	23/12/2022 0:30	205292.66
53	24/12/2022 0:30	178444.61
54	25/12/2022 0:30	182847.14
55	26/12/2022 0:30	211872.74
56	27/12/2022 0:30	257182.12
57	28/12/2022 0:30	227635.71
58	29/12/2022 0:30	180829.31
59	30/12/2022 0:30	195693.50
60	31/12/2022 0:30	206057.80
61	1/01/2023 0:30	240668.82
62	2/01/2023 0:30	226557.25
63	3/01/2023 0:30	196265.82
64	4/01/2023 0:30	194020.48
65	5/01/2023 0:30	186487.50
66	6/01/2023 0:30	181143.69
67	7/01/2023 0:30	188260.67
68	8/01/2023 0:30	208309.97
69	9/01/2023 0:30	227583.62
70	10/01/2023 0:30	210941.76
71	11/01/2023 0:30	247650.19
72	12/01/2023 0:30	240034.88
73	13/01/2023 0:30	240990.92
74	14/01/2023 0:30	261140.71
75	15/01/2023 0:30	191367.64
76	16/01/2023 0:30	235423.13
77	17/01/2023 0:30	291626.60

	SETTLEMENTDATE	TOTALDEMAND
78	18/01/2023 0:30	239143.86
79	19/01/2023 0:30	200679.08
80	20/01/2023 0:30	197552.89
81	21/01/2023 0:30	186401.03
82	22/01/2023 0:30	188658.53
83	23/01/2023 0:30	232309.48
84	24/01/2023 0:30	240453.10
85	25/01/2023 0:30	238191.45
86	26/01/2023 0:30	196093.88
87	27/01/2023 0:30	213011.89
88	28/01/2023 0:30	227026.87
89	29/01/2023 0:30	219160.91
90	30/01/2023 0:30	222605.22
91	31/01/2023 0:30	214033.29
92	1/02/2023 0:30	215754.73
93	2/02/2023 0:30	208955.05
94	3/02/2023 0:30	203144.36
95	4/02/2023 0:30	190171.93
96	5/02/2023 0:30	191000.35
97	6/02/2023 0:30	209626.11
98	7/02/2023 0:30	205595.06
99	8/02/2023 0:30	204501.32
100	9/02/2023 0:30	227856.33
101	10/02/2023 0:30	234316.39
102	11/02/2023 0:30	199583.93
103	12/02/2023 0:30	178444.50
104	13/02/2023 0:30	205722.09
105	14/02/2023 0:30	202646.01
106	15/02/2023 0:30	238244.28
107	16/02/2023 0:30	282225.01
108	17/02/2023 0:30	292454.56
109	18/02/2023 0:30	202981.15
110	19/02/2023 0:30	200827.12
111	20/02/2023 0:30	230070.63
112	21/02/2023 0:30	211603.33
113	22/02/2023 0:30	228512.92
114	23/02/2023 0:30	250012.53
115	24/02/2023 0:30	257630.11
116	25/02/2023 0:30	230907.74

	SETTLEMENTDATE	TOTALDEMAND
117	26/02/2023 0:30	192488.50
118	27/02/2023 0:30	226967.78
119	28/02/2023 0:30	235938.26
120	1/03/2023 0:30	215509.91
121	2/03/2023 0:30	226022.63
122	3/03/2023 0:30	203617.96
123	4/03/2023 0:30	211652.58
124	5/03/2023 0:30	209685.59
125	6/03/2023 0:30	205872.87
126	7/03/2023 0:30	205449.17
127	8/03/2023 0:30	208303.92
128	9/03/2023 0:30	215852.44
129	10/03/2023 0:30	217330.83
130	11/03/2023 0:30	193814.23
131	12/03/2023 0:30	189261.58
132	13/03/2023 0:30	184580.68
133	14/03/2023 0:30	235775.69
134	15/03/2023 0:30	236382.34
135	16/03/2023 0:30	225502.20
136	17/03/2023 0:30	214801.61
137	18/03/2023 0:30	210252.46
138	19/03/2023 0:30	201149.18
139	20/03/2023 0:30	194041.03
140	21/03/2023 0:30	231999.15
141	22/03/2023 0:30	221984.14
142	23/03/2023 0:30	225840.46
143	24/03/2023 0:30	217074.13
144	25/03/2023 0:30	186349.72
145	26/03/2023 0:30	196532.05
146	27/03/2023 0:30	234995.41
147	28/03/2023 0:30	221450.78
148	29/03/2023 0:30	220201.07
149	30/03/2023 0:30	214537.48
150	31/03/2023 0:30	218042.04
151	1/04/2023 0:30	201312.20
152	2/04/2023 0:30	188202.90
153	3/04/2023 0:30	217818.15
154	4/04/2023 0:30	215835.54
155	5/04/2023 0:30	226688.80

	SETTLEMENTDATE	TOTALDEMAND
156	6/04/2023 0:30	221274.71
157	7/04/2023 0:30	195491.72
158	8/04/2023 0:30	184030.16
159	9/04/2023 0:30	195693.53
160	10/04/2023 0:30	211534.73
161	11/04/2023 0:30	217760.14
162	12/04/2023 0:30	224897.12
163	13/04/2023 0:30	216632.17
164	14/04/2023 0:30	204922.00
165	15/04/2023 0:30	204600.36
166	16/04/2023 0:30	196361.29
167	17/04/2023 0:30	226023.04
168	18/04/2023 0:30	208423.60
169	19/04/2023 0:30	221162.63
170	20/04/2023 0:30	227894.85
171	21/04/2023 0:30	232037.55
172	22/04/2023 0:30	207268.41
173	23/04/2023 0:30	195457.58

```
In [8]: grouped_totaldemand['SETTLEMENTDATE'] = pd.to_datetime(grouped_totaldemand['SETTLEMENTDATE'],
grouped_totaldemand['Date'] = grouped_totaldemand['SETTLEMENTDATE'].dt.strftime('%Y-%m-%d')
column_to_drop2 = ["SETTLEMENTDATE"]
grouped_totaldemand_data =grouped_totaldemand.drop(columns = column_to_drop2)
grouped_totaldemand_data
```

Out[8]:

	TOTALDEMAND	Date
0	211901.76	2022-11-01
1	233820.15	2022-11-02
2	235757.80	2022-11-03
3	224741.55	2022-11-04
4	188763.75	2022-11-05
5	177545.00	2022-11-06
6	210882.69	2022-11-07
7	215055.25	2022-11-08
8	216311.19	2022-11-09
9	222407.58	2022-11-10
10	223766.52	2022-11-11
11	188037.61	2022-11-12
12	186450.69	2022-11-13
13	210249.26	2022-11-14
14	222929.51	2022-11-15
15	229488.59	2022-11-16
16	229492.69	2022-11-17
17	201630.49	2022-11-18
18	193603.58	2022-11-19
19	170247.19	2022-11-20
20	221642.42	2022-11-21
21	226308.18	2022-11-22
22	217645.81	2022-11-23
23	216516.55	2022-11-24
24	204648.00	2022-11-25
25	179835.07	2022-11-26
26	175277.76	2022-11-27
27	203457.19	2022-11-28
28	199068.66	2022-11-29
29	203541.68	2022-11-30
30	205941.30	2022-12-01
31	202255.43	2022-12-02
32	207232.32	2022-12-03
33	218784.81	2022-12-04
34	213657.54	2022-12-05
35	208853.77	2022-12-06
36	204581.10	2022-12-07
37	209312.78	2022-12-08
38	203747.71	2022-12-09

	TOTALDEMAND	Date
39	183208.67	2022-12-10
40	195535.11	2022-12-11
41	207573.50	2022-12-12
42	216831.57	2022-12-13
43	213994.46	2022-12-14
44	210373.91	2022-12-15
45	197818.30	2022-12-16
46	171851.19	2022-12-17
47	159424.24	2022-12-18
48	192147.24	2022-12-19
49	199573.40	2022-12-20
50	214232.67	2022-12-21
51	221856.58	2022-12-22
52	205292.66	2022-12-23
53	178444.61	2022-12-24
54	182847.14	2022-12-25
55	211872.74	2022-12-26
56	257182.12	2022-12-27
57	227635.71	2022-12-28
58	180829.31	2022-12-29
59	195693.50	2022-12-30
60	206057.80	2022-12-31
61	240668.82	2023-01-01
62	226557.25	2023-01-02
63	196265.82	2023-01-03
64	194020.48	2023-01-04
65	186487.50	2023-01-05
66	181143.69	2023-01-06
67	188260.67	2023-01-07
68	208309.97	2023-01-08
69	227583.62	2023-01-09
70	210941.76	2023-01-10
71	247650.19	2023-01-11
72	240034.88	2023-01-12
73	240990.92	2023-01-13
74	261140.71	2023-01-14
75	191367.64	2023-01-15
76	235423.13	2023-01-16
77	291626.60	2023-01-17

	TOTALDEMAND	Date
78	239143.86	2023-01-18
79	200679.08	2023-01-19
80	197552.89	2023-01-20
81	186401.03	2023-01-21
82	188658.53	2023-01-22
83	232309.48	2023-01-23
84	240453.10	2023-01-24
85	238191.45	2023-01-25
86	196093.88	2023-01-26
87	213011.89	2023-01-27
88	227026.87	2023-01-28
89	219160.91	2023-01-29
90	222605.22	2023-01-30
91	214033.29	2023-01-31
92	215754.73	2023-02-01
93	208955.05	2023-02-02
94	203144.36	2023-02-03
95	190171.93	2023-02-04
96	191000.35	2023-02-05
97	209626.11	2023-02-06
98	205595.06	2023-02-07
99	204501.32	2023-02-08
100	227856.33	2023-02-09
101	234316.39	2023-02-10
102	199583.93	2023-02-11
103	178444.50	2023-02-12
104	205722.09	2023-02-13
105	202646.01	2023-02-14
106	238244.28	2023-02-15
107	282225.01	2023-02-16
108	292454.56	2023-02-17
109	202981.15	2023-02-18
110	200827.12	2023-02-19
111	230070.63	2023-02-20
112	211603.33	2023-02-21
113	228512.92	2023-02-22
114	250012.53	2023-02-23
115	257630.11	2023-02-24
116	230907.74	2023-02-25

	TOTALDEMAND	Date
117	192488.50	2023-02-26
118	226967.78	2023-02-27
119	235938.26	2023-02-28
120	215509.91	2023-03-01
121	226022.63	2023-03-02
122	203617.96	2023-03-03
123	211652.58	2023-03-04
124	209685.59	2023-03-05
125	205872.87	2023-03-06
126	205449.17	2023-03-07
127	208303.92	2023-03-08
128	215852.44	2023-03-09
129	217330.83	2023-03-10
130	193814.23	2023-03-11
131	189261.58	2023-03-12
132	184580.68	2023-03-13
133	235775.69	2023-03-14
134	236382.34	2023-03-15
135	225502.20	2023-03-16
136	214801.61	2023-03-17
137	210252.46	2023-03-18
138	201149.18	2023-03-19
139	194041.03	2023-03-20
140	231999.15	2023-03-21
141	221984.14	2023-03-22
142	225840.46	2023-03-23
143	217074.13	2023-03-24
144	186349.72	2023-03-25
145	196532.05	2023-03-26
146	234995.41	2023-03-27
147	221450.78	2023-03-28
148	220201.07	2023-03-29
149	214537.48	2023-03-30
150	218042.04	2023-03-31
151	201312.20	2023-04-01
152	188202.90	2023-04-02
153	217818.15	2023-04-03
154	215835.54	2023-04-04
155	226688.80	2023-04-05

	TOTALDEMAND	Date
156	221274.71	2023-04-06
157	195491.72	2023-04-07
158	184030.16	2023-04-08
159	195693.53	2023-04-09
160	211534.73	2023-04-10
161	217760.14	2023-04-11
162	224897.12	2023-04-12
163	216632.17	2023-04-13
164	204922.00	2023-04-14
165	204600.36	2023-04-15
166	196361.29	2023-04-16
167	226023.04	2023-04-17
168	208423.60	2023-04-18
169	221162.63	2023-04-19
170	227894.85	2023-04-20
171	232037.55	2023-04-21
172	207268.41	2023-04-22
173	195457.58	2023-04-23

```
In [9]: grouped_totaldemand['SETTLEMENTDATE'] = pd.to_datetime(grouped_totaldemand['SETTLEMENTDATE'],
grouped_totaldemand['Date'] = grouped_totaldemand['SETTLEMENTDATE'].dt.strftime('%Y-%m-%d')
column_to_drop2 = ["SETTLEMENTDATE"]
grouped_totaldemand_data =grouped_totaldemand.drop(columns = column_to_drop2)
grouped_totaldemand_data
```

Out[9]:

	TOTALDEMAND	Date
0	211901.76	2022-11-01
1	233820.15	2022-11-02
2	235757.80	2022-11-03
3	224741.55	2022-11-04
4	188763.75	2022-11-05
5	177545.00	2022-11-06
6	210882.69	2022-11-07
7	215055.25	2022-11-08
8	216311.19	2022-11-09
9	222407.58	2022-11-10
10	223766.52	2022-11-11
11	188037.61	2022-11-12
12	186450.69	2022-11-13
13	210249.26	2022-11-14
14	222929.51	2022-11-15
15	229488.59	2022-11-16
16	229492.69	2022-11-17
17	201630.49	2022-11-18
18	193603.58	2022-11-19
19	170247.19	2022-11-20
20	221642.42	2022-11-21
21	226308.18	2022-11-22
22	217645.81	2022-11-23
23	216516.55	2022-11-24
24	204648.00	2022-11-25
25	179835.07	2022-11-26
26	175277.76	2022-11-27
27	203457.19	2022-11-28
28	199068.66	2022-11-29
29	203541.68	2022-11-30
30	205941.30	2022-12-01
31	202255.43	2022-12-02
32	207232.32	2022-12-03
33	218784.81	2022-12-04
34	213657.54	2022-12-05
35	208853.77	2022-12-06
36	204581.10	2022-12-07
37	209312.78	2022-12-08
38	203747.71	2022-12-09

	TOTALDEMAND	Date
39	183208.67	2022-12-10
40	195535.11	2022-12-11
41	207573.50	2022-12-12
42	216831.57	2022-12-13
43	213994.46	2022-12-14
44	210373.91	2022-12-15
45	197818.30	2022-12-16
46	171851.19	2022-12-17
47	159424.24	2022-12-18
48	192147.24	2022-12-19
49	199573.40	2022-12-20
50	214232.67	2022-12-21
51	221856.58	2022-12-22
52	205292.66	2022-12-23
53	178444.61	2022-12-24
54	182847.14	2022-12-25
55	211872.74	2022-12-26
56	257182.12	2022-12-27
57	227635.71	2022-12-28
58	180829.31	2022-12-29
59	195693.50	2022-12-30
60	206057.80	2022-12-31
61	240668.82	2023-01-01
62	226557.25	2023-01-02
63	196265.82	2023-01-03
64	194020.48	2023-01-04
65	186487.50	2023-01-05
66	181143.69	2023-01-06
67	188260.67	2023-01-07
68	208309.97	2023-01-08
69	227583.62	2023-01-09
70	210941.76	2023-01-10
71	247650.19	2023-01-11
72	240034.88	2023-01-12
73	240990.92	2023-01-13
74	261140.71	2023-01-14
75	191367.64	2023-01-15
76	235423.13	2023-01-16
77	291626.60	2023-01-17

	TOTALDEMAND	Date
78	239143.86	2023-01-18
79	200679.08	2023-01-19
80	197552.89	2023-01-20
81	186401.03	2023-01-21
82	188658.53	2023-01-22
83	232309.48	2023-01-23
84	240453.10	2023-01-24
85	238191.45	2023-01-25
86	196093.88	2023-01-26
87	213011.89	2023-01-27
88	227026.87	2023-01-28
89	219160.91	2023-01-29
90	222605.22	2023-01-30
91	214033.29	2023-01-31
92	215754.73	2023-02-01
93	208955.05	2023-02-02
94	203144.36	2023-02-03
95	190171.93	2023-02-04
96	191000.35	2023-02-05
97	209626.11	2023-02-06
98	205595.06	2023-02-07
99	204501.32	2023-02-08
100	227856.33	2023-02-09
101	234316.39	2023-02-10
102	199583.93	2023-02-11
103	178444.50	2023-02-12
104	205722.09	2023-02-13
105	202646.01	2023-02-14
106	238244.28	2023-02-15
107	282225.01	2023-02-16
108	292454.56	2023-02-17
109	202981.15	2023-02-18
110	200827.12	2023-02-19
111	230070.63	2023-02-20
112	211603.33	2023-02-21
113	228512.92	2023-02-22
114	250012.53	2023-02-23
115	257630.11	2023-02-24
116	230907.74	2023-02-25

	TOTALDEMAND	Date
117	192488.50	2023-02-26
118	226967.78	2023-02-27
119	235938.26	2023-02-28
120	215509.91	2023-03-01
121	226022.63	2023-03-02
122	203617.96	2023-03-03
123	211652.58	2023-03-04
124	209685.59	2023-03-05
125	205872.87	2023-03-06
126	205449.17	2023-03-07
127	208303.92	2023-03-08
128	215852.44	2023-03-09
129	217330.83	2023-03-10
130	193814.23	2023-03-11
131	189261.58	2023-03-12
132	184580.68	2023-03-13
133	235775.69	2023-03-14
134	236382.34	2023-03-15
135	225502.20	2023-03-16
136	214801.61	2023-03-17
137	210252.46	2023-03-18
138	201149.18	2023-03-19
139	194041.03	2023-03-20
140	231999.15	2023-03-21
141	221984.14	2023-03-22
142	225840.46	2023-03-23
143	217074.13	2023-03-24
144	186349.72	2023-03-25
145	196532.05	2023-03-26
146	234995.41	2023-03-27
147	221450.78	2023-03-28
148	220201.07	2023-03-29
149	214537.48	2023-03-30
150	218042.04	2023-03-31
151	201312.20	2023-04-01
152	188202.90	2023-04-02
153	217818.15	2023-04-03
154	215835.54	2023-04-04
155	226688.80	2023-04-05

	TOTALDEMAND	Date
156	221274.71	2023-04-06
157	195491.72	2023-04-07
158	184030.16	2023-04-08
159	195693.53	2023-04-09
160	211534.73	2023-04-10
161	217760.14	2023-04-11
162	224897.12	2023-04-12
163	216632.17	2023-04-13
164	204922.00	2023-04-14
165	204600.36	2023-04-15
166	196361.29	2023-04-16
167	226023.04	2023-04-17
168	208423.60	2023-04-18
169	221162.63	2023-04-19
170	227894.85	2023-04-20
171	232037.55	2023-04-21
172	207268.41	2023-04-22
173	195457.58	2023-04-23

In [10]:

```
merged_df = pd.merge(weather_dataframe, grouped_totaldemand_data, left_on ='Date', right_on =  
pd.set_option("display.max_rows", None)  
merged_df
```

Out[10]:

	Date	Minimum temperature (°C)	Maximum temperature (°C)	Rainfall (mm)	Direction of maximum wind gust	Speed of maximum wind gust (km/h)	TOTALDEMAND
0	2022-11-01	8.5	13.3	3.0	SW	44.0	211901.76
1	2022-11-02	6.9	15.7	2.8	SSW	43.0	233820.15
2	2022-11-03	9.1	15.4	0.4	SSW	31.0	235757.80
3	2022-11-04	10.2	17.8	0.2	S	24.0	224741.55
4	2022-11-05	11.8	22.7	0.0	N	31.0	188763.75
5	2022-11-06	11.6	27.1	0.0	NNW	33.0	177545.00
6	2022-11-07	13.9	25.9	0.0	W	24.0	210882.69
7	2022-11-08	14.6	27.6	0.0	NNW	35.0	215055.25
8	2022-11-09	15.6	29.3	2.8	NNE	35.0	216311.19
9	2022-11-10	19.8	26.4	0.0	NNW	54.0	222407.58
10	2022-11-11	18.7	20.2	3.0	SSW	30.0	223766.52
11	2022-11-12	14.2	19.3	0.0	SSW	26.0	188037.61
12	2022-11-13	15.4	24.8	6.6	N	44.0	186450.69
13	2022-11-14	13.0	17.4	13.6	SSW	41.0	210249.26
14	2022-11-15	8.0	13.1	14.2	SW	43.0	222929.51
15	2022-11-16	7.2	14.8	0.6	S	43.0	229488.59
16	2022-11-17	9.6	16.3	3.2	SSW	33.0	229492.69
17	2022-11-18	7.2	24.5	0.0	NNW	28.0	201630.49
18	2022-11-19	12.5	22.3	0.0	N	59.0	193603.58
19	2022-11-20	11.8	20.6	16.0	NNW	50.0	170247.19
20	2022-11-21	9.4	13.8	1.2	W	57.0	221642.42
21	2022-11-22	8.7	18.2	2.0	WNW	37.0	226308.18
22	2022-11-23	11.6	17.7	0.6	SSW	30.0	217645.81
23	2022-11-24	12.4	19.2	2.8	SSE	22.0	216516.55

	Date	Minimum temperature (°C)	Maximum temperature (°C)	Rainfall (mm)	Direction of maximum wind gust	Speed of maximum wind gust (km/h)	TOTALDEMAND
24	2022-11-25	11.6	20.6	0.0	S	22.0	204648.00
25	2022-11-26	10.9	27.3	0.0	N	54.0	179835.07
26	2022-11-27	14.7	20.5	0.2	SSW	37.0	175277.76
27	2022-11-28	9.7	18.8	0.2	NW	31.0	203457.19
28	2022-11-29	12.2	18.4	0.4	S	33.0	199068.66
29	2022-11-30	11.6	18.4	0.0	SSW	31.0	203541.68
30	2022-12-01	12.1	18.8	0.0	S	35.0	205941.30
31	2022-12-02	9.4	21.4	0.0	SSW	26.0	202255.43
32	2022-12-03	13.6	31.0	0.0	NNW	31.0	207232.32
33	2022-12-04	17.3	34.5	0.0	NW	44.0	218784.81
34	2022-12-05	16.2	18.1	0.0	SSW	52.0	213657.54
35	2022-12-06	13.4	20.0	1.2	S	31.0	208853.77
36	2022-12-07	13.1	19.3	0.2	SW	41.0	204581.10
37	2022-12-08	9.4	16.0	0.6	S	48.0	209312.78
38	2022-12-09	9.9	17.6	2.4	S	41.0	203747.71
39	2022-12-10	8.1	25.9	0.0	N	31.0	183208.67
40	2022-12-11	14.0	28.6	0.0	N	54.0	195535.11
41	2022-12-12	11.5	17.3	17.4	NW	44.0	207573.50
42	2022-12-13	11.6	17.9	3.2	NNW	44.0	216831.57
43	2022-12-14	9.0	15.8	6.2	S	50.0	213994.46
44	2022-12-15	11.1	16.6	3.4	S	39.0	210373.91
45	2022-12-16	10.8	20.3	0.0	SE	35.0	197818.30
46	2022-12-17	10.9	22.3	0.2	SSE	41.0	171851.19
47	2022-12-18	11.7	23.7	0.0	ESE	37.0	159424.24

	Date	Minimum temperature (°C)	Maximum temperature (°C)	Rainfall (mm)	Direction of maximum wind gust	Speed of maximum wind gust (km/h)	TOTALDEMAND
48	2022-12-19	9.8	26.0	0.0	SSE	33.0	192147.24
49	2022-12-20	10.2	27.3	0.0	SSE	31.0	199573.40
50	2022-12-21	12.9	29.4	0.0	NNE	30.0	214232.67
51	2022-12-22	16.8	25.2	5.2	N	26.0	221856.58
52	2022-12-23	15.7	23.1	1.6	SW	28.0	205292.66
53	2022-12-24	16.7	23.5	0.0	S	31.0	178444.61
54	2022-12-25	12.9	31.9	0.0	SSW	24.0	182847.14
55	2022-12-26	17.0	27.5	0.0	SSW	28.0	211872.74
56	2022-12-27	17.7	37.3	0.0	N	33.0	257182.12
57	2022-12-28	25.0	27.6	0.0	N	46.0	227635.71
58	2022-12-29	14.0	19.3	0.8	SSE	33.0	180829.31
59	2022-12-30	12.6	26.2	0.0	SSW	30.0	195693.50
60	2022-12-31	17.9	30.3	0.0	SSE	30.0	206057.80
61	2023-01-01	18.4	35.9	0.0	N	31.0	240668.82
62	2023-01-02	22.1	32.0	6.4	N	52.0	226557.25
63	2023-01-03	15.2	21.1	0.2	S	37.0	196265.82
64	2023-01-04	15.0	18.7	0.0	SW	52.0	194020.48
65	2023-01-05	14.1	21.6	1.0	S	39.0	186487.50
66	2023-01-06	13.3	25.6	0.0	ESE	37.0	181143.69
67	2023-01-07	13.2	30.2	0.0	SSE	28.0	188260.67
68	2023-01-08	14.9	31.9	0.0	SE	24.0	208309.97
69	2023-01-09	18.4	26.2	0.0	SSW	37.0	227583.62
70	2023-01-10	16.9	21.6	0.0	SSW	35.0	210941.76
71	2023-01-11	15.9	29.9	0.0	SSW	28.0	247650.19

	Date	Minimum temperature (°C)	Maximum temperature (°C)	Rainfall (mm)	Direction of maximum wind gust	Speed of maximum wind gust (km/h)	TOTALDEMAND
72	2023-01-12	18.7	24.0	0.0	SSW	28.0	240034.88
73	2023-01-13	18.0	24.2	0.0	S	31.0	240990.92
74	2023-01-14	20.2	37.6	0.0	NNW	43.0	261140.71
75	2023-01-15	18.0	20.6	0.0	SSW	35.0	191367.64
76	2023-01-16	15.1	27.0	0.0	SSW	24.0	235423.13
77	2023-01-17	16.3	37.2	0.0	NW	48.0	291626.60
78	2023-01-18	19.8	19.9	6.0	S	41.0	239143.86
79	2023-01-19	14.7	19.3	4.6	SSW	41.0	200679.08
80	2023-01-20	15.5	21.0	0.0	SSW	35.0	197552.89
81	2023-01-21	13.8	23.0	0.0	SSW	43.0	186401.03
82	2023-01-22	17.2	23.4	0.0	SSW	35.0	188658.53
83	2023-01-23	18.2	28.0	0.0	S	24.0	232309.48
84	2023-01-24	17.6	28.6	0.0	SSW	41.0	240453.10
85	2023-01-25	17.2	30.0	1.8	SSW	35.0	238191.45
86	2023-01-26	15.9	21.6	0.0	SSW	35.0	196093.88
87	2023-01-27	13.5	26.8	0.0	S	24.0	213011.89
88	2023-01-28	15.2	34.2	0.0	N	43.0	227026.87
89	2023-01-29	19.5	23.8	0.2	SSW	24.0	219160.91
90	2023-01-30	17.9	21.7	0.0	S	33.0	222605.22
91	2023-01-31	15.6	22.2	0.0	S	30.0	214033.29
92	2023-02-01	14.9	21.0	0.0	SSW	39.0	215754.73
93	2023-02-02	14.2	21.3	0.2	NNW	56.0	208955.05
94	2023-02-03	11.4	18.8	11.2	WSW	41.0	203144.36
95	2023-02-04	11.7	20.7	6.6	SSW	31.0	190171.93

	Date	Minimum temperature (°C)	Maximum temperature (°C)	Rainfall (mm)	Direction of maximum wind gust	Speed of maximum wind gust (km/h)	TOTALDEMAND
96	2023-02-05	13.8	19.8	1.2	SSE	26.0	191000.35
97	2023-02-06	16.0	20.9	0.0	SSW	28.0	209626.11
98	2023-02-07	16.6	20.4	0.0	SSW	37.0	205595.06
99	2023-02-08	15.0	22.2	0.0	S	33.0	204501.32
100	2023-02-09	13.2	26.4	0.2	SSW	26.0	227856.33
101	2023-02-10	16.2	26.7	0.0	SSW	28.0	234316.39
102	2023-02-11	15.8	25.7	0.0	SSW	41.0	199583.93
103	2023-02-12	17.3	20.7	0.0	S	46.0	178444.50
104	2023-02-13	15.8	20.9	0.0	SSW	37.0	205722.09
105	2023-02-14	12.0	22.2	0.0	SSW	37.0	202646.01
106	2023-02-15	12.6	32.4	0.0	N	31.0	238244.28
107	2023-02-16	17.1	37.2	0.0	NNW	33.0	282225.01
108	2023-02-17	22.8	40.5	0.0	NNW	46.0	292454.56
109	2023-02-18	17.4	24.9	0.0	SSW	31.0	202981.15
110	2023-02-19	14.9	27.9	0.0	S	30.0	200827.12
111	2023-02-20	14.9	24.0	0.0	SSW	30.0	230070.63
112	2023-02-21	17.7	22.2	0.0	SSE	39.0	211603.33
113	2023-02-22	14.6	30.6	0.0	SSE	33.0	228512.92
114	2023-02-23	17.5	32.4	0.0	N	44.0	250012.53
115	2023-02-24	19.6	32.3	0.0	NNW	46.0	257630.11
116	2023-02-25	22.2	26.7	0.0	N	28.0	230907.74
117	2023-02-26	15.7	23.4	1.4	SSW	30.0	192488.50
118	2023-02-27	16.3	20.2	2.6	SSW	33.0	226967.78
119	2023-02-28	16.5	17.6	0.2	SSW	28.0	235938.26

	Date	Minimum temperature (°C)	Maximum temperature (°C)	Rainfall (mm)	Direction of maximum wind gust	Speed of maximum wind gust (km/h)	TOTALDEMAND
120	2023-03-01	14.3	21.1	3.2	SSW	28.0	215509.91
121	2023-03-02	14.5	21.7	0.8	SSW	26.0	226022.63
122	2023-03-03	15.5	19.8	0.2	SSW	35.0	203617.96
123	2023-03-04	14.1	31.4	0.0	NNE	31.0	211652.58
124	2023-03-05	16.5	32.9	0.0	NNW	44.0	209685.59
125	2023-03-06	15.5	25.3	5.6	NNW	50.0	205872.87
126	2023-03-07	15.4	23.2	0.0	NNW	50.0	205449.17
127	2023-03-08	12.3	19.4	1.0	NW	48.0	208303.92
128	2023-03-09	12.9	22.1	0.0	W	31.0	215852.44
129	2023-03-10	14.5	24.0	0.0	SSE	28.0	217330.83
130	2023-03-11	13.3	24.7	0.0	SSW	31.0	193814.23
131	2023-03-12	15.5	20.7	0.0	SSW	37.0	189261.58
132	2023-03-13	11.7	22.4	0.0	S	30.0	184580.68
133	2023-03-14	15.9	30.5	0.0	NNW	31.0	235775.69
134	2023-03-15	17.6	22.9	0.0	SSW	24.0	236382.34
135	2023-03-16	17.3	28.5	0.0	WSW	39.0	225502.20
136	2023-03-17	15.8	24.6	2.6	SSW	28.0	214801.61
137	2023-03-18	14.6	36.2	0.0	N	52.0	210252.46
138	2023-03-19	17.3	19.0	0.0	SSW	28.0	201149.18
139	2023-03-20	14.9	20.8	0.0	SSW	41.0	194041.03
140	2023-03-21	11.7	19.4	0.0	ESE	17.0	231999.15
141	2023-03-22	13.5	22.8	1.6	SSW	24.0	221984.14
142	2023-03-23	15.3	22.6	10.2	WNW	24.0	225840.46
143	2023-03-24	16.1	21.6	1.4	SSE	31.0	217074.13

	Date	Minimum temperature (°C)	Maximum temperature (°C)	Rainfall (mm)	Direction of maximum wind gust	Speed of maximum wind gust (km/h)	TOTALDEMAND
144	2023-03-25	11.6	19.6	0.2	S	33.0	186349.72
145	2023-03-26	10.7	19.9	0.0	S	20.0	196532.05
146	2023-03-27	13.9	18.3	0.0	N	26.0	234995.41
147	2023-03-28	15.5	20.9	8.0	SSW	24.0	221450.78
148	2023-03-29	14.9	18.5	5.8	S	43.0	220201.07
149	2023-03-30	12.4	19.1	8.2	WSW	31.0	214537.48
150	2023-03-31	14.1	19.4	0.0	S	33.0	218042.04
151	2023-04-01	11.3	16.4	4.6	SSE	33.0	201312.20
152	2023-04-02	8.7	18.3	0.2	S	22.0	188202.90
153	2023-04-03	8.8	22.6	0.0	SSW	19.0	217818.15
154	2023-04-04	12.0	21.7	0.0	SSW	28.0	215835.54
155	2023-04-05	13.8	18.4	0.0	SSW	22.0	226688.80
156	2023-04-06	13.4	26.3	0.0	NNW	43.0	221274.71
157	2023-04-07	16.1	19.9	4.4	N	41.0	195491.72
158	2023-04-08	13.7	18.0	11.2	SW	35.0	184030.16
159	2023-04-09	10.5	15.5	7.8	SSW	43.0	195693.53
160	2023-04-10	10.1	15.2	14.8	S	35.0	211534.73
161	2023-04-11	11.9	19.1	6.0	SSW	19.0	217760.14
162	2023-04-12	12.6	19.3	7.0	N	41.0	224897.12
163	2023-04-13	11.2	22.8	4.4	E	28.0	216632.17
164	2023-04-14	10.8	25.4	0.0	NNW	20.0	204922.00
165	2023-04-15	13.8	21.2	0.0	NNW	54.0	204600.36
166	2023-04-16	12.1	17.2	38.4	SSW	35.0	196361.29
167	2023-04-17	8.7	20.7	2.0	N	24.0	226023.04

	Date	Minimum temperature (°C)	Maximum temperature (°C)	Rainfall (mm)	Direction of maximum wind gust	Speed of maximum wind gust (km/h)	TOTALDEMAND
168	2023-04-18	13.4	22.8	0.0	NNW	35.0	208423.60
169	2023-04-19	14.4	17.5	1.2	SW	28.0	221162.63
170	2023-04-20	7.8	18.5	0.0	SSW	17.0	227894.85
171	2023-04-21	11.3	19.0	0.0	SSW	13.0	232037.55
172	2023-04-22	14.6	19.2	0.0	SSW	22.0	207268.41
173	2023-04-23	14.8	19.0	0.0	SSW	26.0	195457.58

In [11]:

```
merged_df["Temp_Gap (°C)"] = merged_df["Maximum temperature (°C)"] - merged_df["Minimum temperature (°C)"]
selected_columns = ["Date", "Maximum temperature (°C)", "Minimum temperature (°C)", "Temp_Gap (°C)"]
merged_df = merged_df[selected_columns].copy()
```

```
merged_df
```

Out[11]:

	Date	Maximum temperature (°C)	Minimum temperature (°C)	Temp_Gap (°C)	Rainfall (mm)	Direction of maximum wind gust	Speed of maximum wind gust (km/h)	TOTALDEMAND
0	2022-11-01	13.3	8.5	4.8	3.0	SW	44.0	211901.76
1	2022-11-02	15.7	6.9	8.8	2.8	SSW	43.0	233820.15
2	2022-11-03	15.4	9.1	6.3	0.4	SSW	31.0	235757.80
3	2022-11-04	17.8	10.2	7.6	0.2	S	24.0	224741.55
4	2022-11-05	22.7	11.8	10.9	0.0	N	31.0	188763.75
5	2022-11-06	27.1	11.6	15.5	0.0	NNW	33.0	177545.00
6	2022-11-07	25.9	13.9	12.0	0.0	W	24.0	210882.69
7	2022-11-08	27.6	14.6	13.0	0.0	NNW	35.0	215055.25
8	2022-11-09	29.3	15.6	13.7	2.8	NNE	35.0	216311.19
9	2022-11-10	26.4	19.8	6.6	0.0	NNW	54.0	222407.58
10	2022-11-11	20.2	18.7	1.5	3.0	SSW	30.0	223766.52
11	2022-11-12	19.3	14.2	5.1	0.0	SSW	26.0	188037.61
12	2022-11-13	24.8	15.4	9.4	6.6	N	44.0	186450.69
13	2022-11-14	17.4	13.0	4.4	13.6	SSW	41.0	210249.26
14	2022-11-15	13.1	8.0	5.1	14.2	SW	43.0	222929.51
15	2022-11-16	14.8	7.2	7.6	0.6	S	43.0	229488.59
16	2022-11-17	16.3	9.6	6.7	3.2	SSW	33.0	229492.69
17	2022-11-18	24.5	7.2	17.3	0.0	NNW	28.0	201630.49
18	2022-11-19	22.3	12.5	9.8	0.0	N	59.0	193603.58
19	2022-11-20	20.6	11.8	8.8	16.0	NNW	50.0	170247.19
20	2022-11-21	13.8	9.4	4.4	1.2	W	57.0	221642.42
21	2022-11-22	18.2	8.7	9.5	2.0	WNW	37.0	226308.18
22	2022-11-23	17.7	11.6	6.1	0.6	SSW	30.0	217645.81

	Date	Maximum temperature (°C)	Minimum temperature (°C)	Temp_Gap (°C)	Rainfall (mm)	Direction of maximum wind gust	Speed of maximum wind gust (km/h)	TOTALDEMAND
23	2022-11-24	19.2	12.4	6.8	2.8	SSE	22.0	216516.55
24	2022-11-25	20.6	11.6	9.0	0.0	S	22.0	204648.00
25	2022-11-26	27.3	10.9	16.4	0.0	N	54.0	179835.07
26	2022-11-27	20.5	14.7	5.8	0.2	SSW	37.0	175277.76
27	2022-11-28	18.8	9.7	9.1	0.2	NW	31.0	203457.19
28	2022-11-29	18.4	12.2	6.2	0.4	S	33.0	199068.66
29	2022-11-30	18.4	11.6	6.8	0.0	SSW	31.0	203541.68
30	2022-12-01	18.8	12.1	6.7	0.0	S	35.0	205941.30
31	2022-12-02	21.4	9.4	12.0	0.0	SSW	26.0	202255.43
32	2022-12-03	31.0	13.6	17.4	0.0	NNW	31.0	207232.32
33	2022-12-04	34.5	17.3	17.2	0.0	NW	44.0	218784.81
34	2022-12-05	18.1	16.2	1.9	0.0	SSW	52.0	213657.54
35	2022-12-06	20.0	13.4	6.6	1.2	S	31.0	208853.77
36	2022-12-07	19.3	13.1	6.2	0.2	SW	41.0	204581.10
37	2022-12-08	16.0	9.4	6.6	0.6	S	48.0	209312.78
38	2022-12-09	17.6	9.9	7.7	2.4	S	41.0	203747.71
39	2022-12-10	25.9	8.1	17.8	0.0	N	31.0	183208.67
40	2022-12-11	28.6	14.0	14.6	0.0	N	54.0	195535.11
41	2022-12-12	17.3	11.5	5.8	17.4	NW	44.0	207573.50
42	2022-12-13	17.9	11.6	6.3	3.2	NNW	44.0	216831.57
43	2022-12-14	15.8	9.0	6.8	6.2	S	50.0	213994.46
44	2022-12-15	16.6	11.1	5.5	3.4	S	39.0	210373.91
45	2022-12-16	20.3	10.8	9.5	0.0	SE	35.0	197818.30

	Date	Maximum temperature (°C)	Minimum temperature (°C)	Temp_Gap (°C)	Rainfall (mm)	Direction of maximum wind gust	Speed of maximum wind gust (km/h)	TOTALDEMAND
46	2022-12-17	22.3	10.9	11.4	0.2	SSE	41.0	171851.19
47	2022-12-18	23.7	11.7	12.0	0.0	ESE	37.0	159424.24
48	2022-12-19	26.0	9.8	16.2	0.0	SSE	33.0	192147.24
49	2022-12-20	27.3	10.2	17.1	0.0	SSE	31.0	199573.40
50	2022-12-21	29.4	12.9	16.5	0.0	NNE	30.0	214232.67
51	2022-12-22	25.2	16.8	8.4	5.2	N	26.0	221856.58
52	2022-12-23	23.1	15.7	7.4	1.6	SW	28.0	205292.66
53	2022-12-24	23.5	16.7	6.8	0.0	S	31.0	178444.61
54	2022-12-25	31.9	12.9	19.0	0.0	SSW	24.0	182847.14
55	2022-12-26	27.5	17.0	10.5	0.0	SSW	28.0	211872.74
56	2022-12-27	37.3	17.7	19.6	0.0	N	33.0	257182.12
57	2022-12-28	27.6	25.0	2.6	0.0	N	46.0	227635.71
58	2022-12-29	19.3	14.0	5.3	0.8	SSE	33.0	180829.31
59	2022-12-30	26.2	12.6	13.6	0.0	SSW	30.0	195693.50
60	2022-12-31	30.3	17.9	12.4	0.0	SSE	30.0	206057.80
61	2023-01-01	35.9	18.4	17.5	0.0	N	31.0	240668.82
62	2023-01-02	32.0	22.1	9.9	6.4	N	52.0	226557.25
63	2023-01-03	21.1	15.2	5.9	0.2	S	37.0	196265.82
64	2023-01-04	18.7	15.0	3.7	0.0	SW	52.0	194020.48
65	2023-01-05	21.6	14.1	7.5	1.0	S	39.0	186487.50
66	2023-01-06	25.6	13.3	12.3	0.0	ESE	37.0	181143.69
67	2023-01-07	30.2	13.2	17.0	0.0	SSE	28.0	188260.67
68	2023-01-08	31.9	14.9	17.0	0.0	SE	24.0	208309.97

	Date	Maximum temperature (°C)	Minimum temperature (°C)	Temp_Gap (°C)	Rainfall (mm)	Direction of maximum wind gust	Speed of maximum wind gust (km/h)	TOTALDEMAND
69	2023-01-09	26.2	18.4	7.8	0.0	SSW	37.0	227583.62
70	2023-01-10	21.6	16.9	4.7	0.0	SSW	35.0	210941.76
71	2023-01-11	29.9	15.9	14.0	0.0	SSW	28.0	247650.19
72	2023-01-12	24.0	18.7	5.3	0.0	SSW	28.0	240034.88
73	2023-01-13	24.2	18.0	6.2	0.0	S	31.0	240990.92
74	2023-01-14	37.6	20.2	17.4	0.0	NNW	43.0	261140.71
75	2023-01-15	20.6	18.0	2.6	0.0	SSW	35.0	191367.64
76	2023-01-16	27.0	15.1	11.9	0.0	SSW	24.0	235423.13
77	2023-01-17	37.2	16.3	20.9	0.0	NW	48.0	291626.60
78	2023-01-18	19.9	19.8	0.1	6.0	S	41.0	239143.86
79	2023-01-19	19.3	14.7	4.6	4.6	SSW	41.0	200679.08
80	2023-01-20	21.0	15.5	5.5	0.0	SSW	35.0	197552.89
81	2023-01-21	23.0	13.8	9.2	0.0	SSW	43.0	186401.03
82	2023-01-22	23.4	17.2	6.2	0.0	SSW	35.0	188658.53
83	2023-01-23	28.0	18.2	9.8	0.0	S	24.0	232309.48
84	2023-01-24	28.6	17.6	11.0	0.0	SSW	41.0	240453.10
85	2023-01-25	30.0	17.2	12.8	1.8	SSW	35.0	238191.45
86	2023-01-26	21.6	15.9	5.7	0.0	SSW	35.0	196093.88
87	2023-01-27	26.8	13.5	13.3	0.0	S	24.0	213011.89
88	2023-01-28	34.2	15.2	19.0	0.0	N	43.0	227026.87
89	2023-01-29	23.8	19.5	4.3	0.2	SSW	24.0	219160.91
90	2023-01-30	21.7	17.9	3.8	0.0	S	33.0	222605.22
91	2023-01-31	22.2	15.6	6.6	0.0	S	30.0	214033.29

	Date	Maximum temperature (°C)	Minimum temperature (°C)	Temp_Gap (°C)	Rainfall (mm)	Direction of maximum wind gust	Speed of maximum wind gust (km/h)	TOTALDEMAND
92	2023-02-01	21.0	14.9	6.1	0.0	SSW	39.0	215754.73
93	2023-02-02	21.3	14.2	7.1	0.2	NNW	56.0	208955.05
94	2023-02-03	18.8	11.4	7.4	11.2	WSW	41.0	203144.36
95	2023-02-04	20.7	11.7	9.0	6.6	SSW	31.0	190171.93
96	2023-02-05	19.8	13.8	6.0	1.2	SSE	26.0	191000.35
97	2023-02-06	20.9	16.0	4.9	0.0	SSW	28.0	209626.11
98	2023-02-07	20.4	16.6	3.8	0.0	SSW	37.0	205595.06
99	2023-02-08	22.2	15.0	7.2	0.0	S	33.0	204501.32
100	2023-02-09	26.4	13.2	13.2	0.2	SSW	26.0	227856.33
101	2023-02-10	26.7	16.2	10.5	0.0	SSW	28.0	234316.39
102	2023-02-11	25.7	15.8	9.9	0.0	SSW	41.0	199583.93
103	2023-02-12	20.7	17.3	3.4	0.0	S	46.0	178444.50
104	2023-02-13	20.9	15.8	5.1	0.0	SSW	37.0	205722.09
105	2023-02-14	22.2	12.0	10.2	0.0	SSW	37.0	202646.01
106	2023-02-15	32.4	12.6	19.8	0.0	N	31.0	238244.28
107	2023-02-16	37.2	17.1	20.1	0.0	NNW	33.0	282225.01
108	2023-02-17	40.5	22.8	17.7	0.0	NNW	46.0	292454.56
109	2023-02-18	24.9	17.4	7.5	0.0	SSW	31.0	202981.15
110	2023-02-19	27.9	14.9	13.0	0.0	S	30.0	200827.12
111	2023-02-20	24.0	14.9	9.1	0.0	SSW	30.0	230070.63
112	2023-02-21	22.2	17.7	4.5	0.0	SSE	39.0	211603.33
113	2023-02-22	30.6	14.6	16.0	0.0	SSE	33.0	228512.92
114	2023-02-23	32.4	17.5	14.9	0.0	N	44.0	250012.53

	Date	Maximum temperature (°C)	Minimum temperature (°C)	Temp_Gap (°C)	Rainfall (mm)	Direction of maximum wind gust	Speed of maximum wind gust (km/h)	TOTALDEMAND
115	2023-02-24	32.3	19.6	12.7	0.0	NNW	46.0	257630.11
116	2023-02-25	26.7	22.2	4.5	0.0	N	28.0	230907.74
117	2023-02-26	23.4	15.7	7.7	1.4	SSW	30.0	192488.50
118	2023-02-27	20.2	16.3	3.9	2.6	SSW	33.0	226967.78
119	2023-02-28	17.6	16.5	1.1	0.2	SSW	28.0	235938.26
120	2023-03-01	21.1	14.3	6.8	3.2	SSW	28.0	215509.91
121	2023-03-02	21.7	14.5	7.2	0.8	SSW	26.0	226022.63
122	2023-03-03	19.8	15.5	4.3	0.2	SSW	35.0	203617.96
123	2023-03-04	31.4	14.1	17.3	0.0	NNE	31.0	211652.58
124	2023-03-05	32.9	16.5	16.4	0.0	NNW	44.0	209685.59
125	2023-03-06	25.3	15.5	9.8	5.6	NNW	50.0	205872.87
126	2023-03-07	23.2	15.4	7.8	0.0	NNW	50.0	205449.17
127	2023-03-08	19.4	12.3	7.1	1.0	NW	48.0	208303.92
128	2023-03-09	22.1	12.9	9.2	0.0	W	31.0	215852.44
129	2023-03-10	24.0	14.5	9.5	0.0	SSE	28.0	217330.83
130	2023-03-11	24.7	13.3	11.4	0.0	SSW	31.0	193814.23
131	2023-03-12	20.7	15.5	5.2	0.0	SSW	37.0	189261.58
132	2023-03-13	22.4	11.7	10.7	0.0	S	30.0	184580.68
133	2023-03-14	30.5	15.9	14.6	0.0	NNW	31.0	235775.69
134	2023-03-15	22.9	17.6	5.3	0.0	SSW	24.0	236382.34
135	2023-03-16	28.5	17.3	11.2	0.0	WSW	39.0	225502.20
136	2023-03-17	24.6	15.8	8.8	2.6	SSW	28.0	214801.61
137	2023-03-18	36.2	14.6	21.6	0.0	N	52.0	210252.46

	Date	Maximum temperature (°C)	Minimum temperature (°C)	Temp_Gap (°C)	Rainfall (mm)	Direction of maximum wind gust	Speed of maximum wind gust (km/h)	TOTALDEMAND
138	2023-03-19	19.0	17.3	1.7	0.0	SSW	28.0	201149.18
139	2023-03-20	20.8	14.9	5.9	0.0	SSW	41.0	194041.03
140	2023-03-21	19.4	11.7	7.7	0.0	ESE	17.0	231999.15
141	2023-03-22	22.8	13.5	9.3	1.6	SSW	24.0	221984.14
142	2023-03-23	22.6	15.3	7.3	10.2	WNW	24.0	225840.46
143	2023-03-24	21.6	16.1	5.5	1.4	SSE	31.0	217074.13
144	2023-03-25	19.6	11.6	8.0	0.2	S	33.0	186349.72
145	2023-03-26	19.9	10.7	9.2	0.0	S	20.0	196532.05
146	2023-03-27	18.3	13.9	4.4	0.0	N	26.0	234995.41
147	2023-03-28	20.9	15.5	5.4	8.0	SSW	24.0	221450.78
148	2023-03-29	18.5	14.9	3.6	5.8	S	43.0	220201.07
149	2023-03-30	19.1	12.4	6.7	8.2	WSW	31.0	214537.48
150	2023-03-31	19.4	14.1	5.3	0.0	S	33.0	218042.04
151	2023-04-01	16.4	11.3	5.1	4.6	SSE	33.0	201312.20
152	2023-04-02	18.3	8.7	9.6	0.2	S	22.0	188202.90
153	2023-04-03	22.6	8.8	13.8	0.0	SSW	19.0	217818.15
154	2023-04-04	21.7	12.0	9.7	0.0	SSW	28.0	215835.54
155	2023-04-05	18.4	13.8	4.6	0.0	SSW	22.0	226688.80
156	2023-04-06	26.3	13.4	12.9	0.0	NNW	43.0	221274.71
157	2023-04-07	19.9	16.1	3.8	4.4	N	41.0	195491.72
158	2023-04-08	18.0	13.7	4.3	11.2	SW	35.0	184030.16
159	2023-04-09	15.5	10.5	5.0	7.8	SSW	43.0	195693.53
160	2023-04-10	15.2	10.1	5.1	14.8	S	35.0	211534.73

	Date	Maximum temperature (°C)	Minimum temperature (°C)	Temp_Gap (°C)	Rainfall (mm)	Direction of maximum wind gust	Speed of maximum wind gust (km/h)	TOTALDEMAND
161	2023-04-11	19.1	11.9	7.2	6.0	SSW	19.0	217760.14
162	2023-04-12	19.3	12.6	6.7	7.0	N	41.0	224897.12
163	2023-04-13	22.8	11.2	11.6	4.4	E	28.0	216632.17
164	2023-04-14	25.4	10.8	14.6	0.0	NNW	20.0	204922.00
165	2023-04-15	21.2	13.8	7.4	0.0	NNW	54.0	204600.36
166	2023-04-16	17.2	12.1	5.1	38.4	SSW	35.0	196361.29
167	2023-04-17	20.7	8.7	12.0	2.0	N	24.0	226023.04
168	2023-04-18	22.8	13.4	9.4	0.0	NNW	35.0	208423.60
169	2023-04-19	17.5	14.4	3.1	1.2	SW	28.0	221162.63
170	2023-04-20	18.5	7.8	10.7	0.0	SSW	17.0	227894.85
171	2023-04-21	19.0	11.3	7.7	0.0	SSW	13.0	232037.55
172	2023-04-22	19.2	14.6	4.6	0.0	SSW	22.0	207268.41
173	2023-04-23	19.0	14.8	4.2	0.0	SSW	26.0	195457.58

```
In [12]: merged_df["TOTALDEMAND"].describe()
```

```
Out[12]:
count      174.000000
mean     212200.190115
std      20931.643114
min     159424.240000
25%    198130.890000
50%    210912.225000
75%    225350.930000
max    292454.560000
Name: TOTALDEMAND, dtype: float64
```

```
In [13]:
# Define bin range
bins = [0, 198130.890, 210912.225, 225350.930, float('inf')]
labels = ['Low Demand', 'Medium Demand', 'Medium-High Demand', 'High Demand']

merged_df['Demand Category'] = pd.cut(merged_df['TOTALDEMAND'], bins=bins, labels=labels, rig
print(merged_df[['TOTALDEMAND', 'Demand Category']])
```

	TOTALDEMAND	Demand Category
0	211901.76	Medium-High Demand
1	233820.15	High Demand
2	235757.80	High Demand
3	224741.55	Medium-High Demand
4	188763.75	Low Demand
5	177545.00	Low Demand
6	210882.69	Medium Demand
7	215055.25	Medium-High Demand
8	216311.19	Medium-High Demand
9	222407.58	Medium-High Demand
10	223766.52	Medium-High Demand
11	188037.61	Low Demand
12	186450.69	Low Demand
13	210249.26	Medium Demand
14	222929.51	Medium-High Demand
15	229488.59	High Demand
16	229492.69	High Demand
17	201630.49	Medium Demand
18	193603.58	Low Demand
19	170247.19	Low Demand
20	221642.42	Medium-High Demand
21	226308.18	High Demand
22	217645.81	Medium-High Demand
23	216516.55	Medium-High Demand
24	204648.00	Medium Demand
25	179835.07	Low Demand
26	175277.76	Low Demand
27	203457.19	Medium Demand
28	199068.66	Medium Demand
29	203541.68	Medium Demand
30	205941.30	Medium Demand
31	202255.43	Medium Demand
32	207232.32	Medium Demand
33	218784.81	Medium-High Demand
34	213657.54	Medium-High Demand
35	208853.77	Medium Demand
36	204581.10	Medium Demand
37	209312.78	Medium Demand
38	203747.71	Medium Demand
39	183208.67	Low Demand
40	195535.11	Low Demand
41	207573.50	Medium Demand
42	216831.57	Medium-High Demand
43	213994.46	Medium-High Demand
44	210373.91	Medium Demand
45	197818.30	Low Demand
46	171851.19	Low Demand
47	159424.24	Low Demand
48	192147.24	Low Demand
49	199573.40	Medium Demand
50	214232.67	Medium-High Demand
51	221856.58	Medium-High Demand
52	205292.66	Medium Demand
53	178444.61	Low Demand
54	182847.14	Low Demand
55	211872.74	Medium-High Demand
56	257182.12	High Demand
57	227635.71	High Demand
58	180829.31	Low Demand
59	195693.50	Low Demand
60	206057.80	Medium Demand
61	240668.82	High Demand
62	226557.25	High Demand
63	196265.82	Low Demand
64	194020.48	Low Demand
65	186487.50	Low Demand
66	181143.69	Low Demand
67	188260.67	Low Demand

68	208309.97	Medium Demand
69	227583.62	High Demand
70	210941.76	Medium-High Demand
71	247650.19	High Demand
72	240034.88	High Demand
73	240990.92	High Demand
74	261140.71	High Demand
75	191367.64	Low Demand
76	235423.13	High Demand
77	291626.60	High Demand
78	239143.86	High Demand
79	200679.08	Medium Demand
80	197552.89	Low Demand
81	186401.03	Low Demand
82	188658.53	Low Demand
83	232309.48	High Demand
84	240453.10	High Demand
85	238191.45	High Demand
86	196093.88	Low Demand
87	213011.89	Medium-High Demand
88	227026.87	High Demand
89	219160.91	Medium-High Demand
90	222605.22	Medium-High Demand
91	214033.29	Medium-High Demand
92	215754.73	Medium-High Demand
93	208955.05	Medium Demand
94	203144.36	Medium Demand
95	190171.93	Low Demand
96	191000.35	Low Demand
97	209626.11	Medium Demand
98	205595.06	Medium Demand
99	204501.32	Medium Demand
100	227856.33	High Demand
101	234316.39	High Demand
102	199583.93	Medium Demand
103	178444.50	Low Demand
104	205722.09	Medium Demand
105	202646.01	Medium Demand
106	238244.28	High Demand
107	282225.01	High Demand
108	292454.56	High Demand
109	202981.15	Medium Demand
110	200827.12	Medium Demand
111	230070.63	High Demand
112	211603.33	Medium-High Demand
113	228512.92	High Demand
114	250012.53	High Demand
115	257630.11	High Demand
116	230907.74	High Demand
117	192488.50	Low Demand
118	226967.78	High Demand
119	235938.26	High Demand
120	215509.91	Medium-High Demand
121	226022.63	High Demand
122	203617.96	Medium Demand
123	211652.58	Medium-High Demand
124	209685.59	Medium Demand
125	205872.87	Medium Demand
126	205449.17	Medium Demand
127	208303.92	Medium Demand
128	215852.44	Medium-High Demand
129	217330.83	Medium-High Demand
130	193814.23	Low Demand
131	189261.58	Low Demand
132	184580.68	Low Demand
133	235775.69	High Demand
134	236382.34	High Demand
135	225502.20	High Demand
136	214801.61	Medium-High Demand

137	210252.46	Medium Demand
138	201149.18	Medium Demand
139	194041.03	Low Demand
140	231999.15	High Demand
141	221984.14	Medium-High Demand
142	225840.46	High Demand
143	217074.13	Medium-High Demand
144	186349.72	Low Demand
145	196532.05	Low Demand
146	234995.41	High Demand
147	221450.78	Medium-High Demand
148	220201.07	Medium-High Demand
149	214537.48	Medium-High Demand
150	218042.04	Medium-High Demand
151	201312.20	Medium Demand
152	188202.90	Low Demand
153	217818.15	Medium-High Demand
154	215835.54	Medium-High Demand
155	226688.80	High Demand
156	221274.71	Medium-High Demand
157	195491.72	Low Demand
158	184030.16	Low Demand
159	195693.53	Low Demand
160	211534.73	Medium-High Demand
161	217760.14	Medium-High Demand
162	224897.12	Medium-High Demand
163	216632.17	Medium-High Demand
164	204922.00	Medium Demand
165	204600.36	Medium Demand
166	196361.29	Low Demand
167	226023.04	High Demand
168	208423.60	Medium Demand
169	221162.63	Medium-High Demand
170	227894.85	High Demand
171	232037.55	High Demand
172	207268.41	Medium Demand
173	195457.58	Low Demand

In [14]:

```
mapping_dict = {'N': 1, 'NNE': 2, 'NE': 3, 'ENE': 4, 'E': 5, 'ESE': 6, 'SE': 7, 'SSE': 8, 'S': 9, 'SSW': 10, 'SW': 11, 'WSW': 12, 'W': 13, 'WNW': 14, 'NW': 15, 'NNW': 16}
merged_df["Direction of maximum wind gust"] = merged_df["Direction of maximum wind gust"].map(mapping_dict)
merged_df
```

Out[14]:

	Date	Maximum temperature (°C)	Minimum temperature (°C)	Temp_Gap (°C)	Rainfall (mm)	Direction of maximum wind gust	Speed of maximum wind gust (km/h)	TOTALDEMAND	Demand Category
0	2022-11-01	13.3	8.5	4.8	3.0	11	44.0	211901.76	Medium-High Demand
1	2022-11-02	15.7	6.9	8.8	2.8	10	43.0	233820.15	High Demand
2	2022-11-03	15.4	9.1	6.3	0.4	10	31.0	235757.80	High Demand
3	2022-11-04	17.8	10.2	7.6	0.2	9	24.0	224741.55	Medium-High Demand
4	2022-11-05	22.7	11.8	10.9	0.0	1	31.0	188763.75	Low Demand
5	2022-11-06	27.1	11.6	15.5	0.0	16	33.0	177545.00	Low Demand
6	2022-11-07	25.9	13.9	12.0	0.0	13	24.0	210882.69	Medium Demand
7	2022-11-08	27.6	14.6	13.0	0.0	16	35.0	215055.25	Medium-High Demand
8	2022-11-09	29.3	15.6	13.7	2.8	2	35.0	216311.19	Medium-High Demand
9	2022-11-10	26.4	19.8	6.6	0.0	16	54.0	222407.58	Medium-High Demand
10	2022-11-11	20.2	18.7	1.5	3.0	10	30.0	223766.52	Medium-High Demand
11	2022-11-12	19.3	14.2	5.1	0.0	10	26.0	188037.61	Low Demand
12	2022-11-13	24.8	15.4	9.4	6.6	1	44.0	186450.69	Low Demand
13	2022-11-14	17.4	13.0	4.4	13.6	10	41.0	210249.26	Medium Demand
14	2022-11-15	13.1	8.0	5.1	14.2	11	43.0	222929.51	Medium-High Demand
15	2022-11-16	14.8	7.2	7.6	0.6	9	43.0	229488.59	High Demand
16	2022-11-17	16.3	9.6	6.7	3.2	10	33.0	229492.69	High Demand
17	2022-11-18	24.5	7.2	17.3	0.0	16	28.0	201630.49	Medium Demand
18	2022-11-19	22.3	12.5	9.8	0.0	1	59.0	193603.58	Low Demand
19	2022-11-20	20.6	11.8	8.8	16.0	16	50.0	170247.19	Low Demand
20	2022-11-21	13.8	9.4	4.4	1.2	13	57.0	221642.42	Medium-High

	Date	Maximum temperature (°C)	Minimum temperature (°C)	Temp_Gap (°C)	Rainfall (mm)	Direction of maximum wind gust	Speed of maximum wind gust (km/h)	TOTALDEMAND	Demand Category
Demand									
21	2022-11-22	18.2	8.7	9.5	2.0	14	37.0	226308.18	High Demand
22	2022-11-23	17.7	11.6	6.1	0.6	10	30.0	217645.81	Medium-High Demand
23	2022-11-24	19.2	12.4	6.8	2.8	8	22.0	216516.55	Medium-High Demand
24	2022-11-25	20.6	11.6	9.0	0.0	9	22.0	204648.00	Medium Demand
25	2022-11-26	27.3	10.9	16.4	0.0	1	54.0	179835.07	Low Demand
26	2022-11-27	20.5	14.7	5.8	0.2	10	37.0	175277.76	Low Demand
27	2022-11-28	18.8	9.7	9.1	0.2	15	31.0	203457.19	Medium Demand
28	2022-11-29	18.4	12.2	6.2	0.4	9	33.0	199068.66	Medium Demand
29	2022-11-30	18.4	11.6	6.8	0.0	10	31.0	203541.68	Medium Demand
30	2022-12-01	18.8	12.1	6.7	0.0	9	35.0	205941.30	Medium Demand
31	2022-12-02	21.4	9.4	12.0	0.0	10	26.0	202255.43	Medium Demand
32	2022-12-03	31.0	13.6	17.4	0.0	16	31.0	207232.32	Medium Demand
33	2022-12-04	34.5	17.3	17.2	0.0	15	44.0	218784.81	Medium-High Demand
34	2022-12-05	18.1	16.2	1.9	0.0	10	52.0	213657.54	Medium-High Demand
35	2022-12-06	20.0	13.4	6.6	1.2	9	31.0	208853.77	Medium Demand
36	2022-12-07	19.3	13.1	6.2	0.2	11	41.0	204581.10	Medium Demand
37	2022-12-08	16.0	9.4	6.6	0.6	9	48.0	209312.78	Medium Demand
38	2022-12-09	17.6	9.9	7.7	2.4	9	41.0	203747.71	Medium Demand
39	2022-12-10	25.9	8.1	17.8	0.0	1	31.0	183208.67	Low Demand
40	2022-12-11	28.6	14.0	14.6	0.0	1	54.0	195535.11	Low Demand
41	2022-12-12	17.3	11.5	5.8	17.4	15	44.0	207573.50	Medium Demand

	Date	Maximum temperature (°C)	Minimum temperature (°C)	Temp Gap (°C)	Rainfall (mm)	Direction of maximum wind gust	Speed of maximum wind gust (km/h)	TOTALDEMAND	Demand Category
42	2022-12-13	17.9	11.6	6.3	3.2	16	44.0	216831.57	Medium-High Demand
43	2022-12-14	15.8	9.0	6.8	6.2	9	50.0	213994.46	Medium-High Demand
44	2022-12-15	16.6	11.1	5.5	3.4	9	39.0	210373.91	Medium Demand
45	2022-12-16	20.3	10.8	9.5	0.0	7	35.0	197818.30	Low Demand
46	2022-12-17	22.3	10.9	11.4	0.2	8	41.0	171851.19	Low Demand
47	2022-12-18	23.7	11.7	12.0	0.0	6	37.0	159424.24	Low Demand
48	2022-12-19	26.0	9.8	16.2	0.0	8	33.0	192147.24	Low Demand
49	2022-12-20	27.3	10.2	17.1	0.0	8	31.0	199573.40	Medium Demand
50	2022-12-21	29.4	12.9	16.5	0.0	2	30.0	214232.67	Medium-High Demand
51	2022-12-22	25.2	16.8	8.4	5.2	1	26.0	221856.58	Medium-High Demand
52	2022-12-23	23.1	15.7	7.4	1.6	11	28.0	205292.66	Medium Demand
53	2022-12-24	23.5	16.7	6.8	0.0	9	31.0	178444.61	Low Demand
54	2022-12-25	31.9	12.9	19.0	0.0	10	24.0	182847.14	Low Demand
55	2022-12-26	27.5	17.0	10.5	0.0	10	28.0	211872.74	Medium-High Demand
56	2022-12-27	37.3	17.7	19.6	0.0	1	33.0	257182.12	High Demand
57	2022-12-28	27.6	25.0	2.6	0.0	1	46.0	227635.71	High Demand
58	2022-12-29	19.3	14.0	5.3	0.8	8	33.0	180829.31	Low Demand
59	2022-12-30	26.2	12.6	13.6	0.0	10	30.0	195693.50	Low Demand
60	2022-12-31	30.3	17.9	12.4	0.0	8	30.0	206057.80	Medium Demand
61	2023-01-01	35.9	18.4	17.5	0.0	1	31.0	240668.82	High Demand
62	2023-01-02	32.0	22.1	9.9	6.4	1	52.0	226557.25	High Demand
63	2023-	21.1	15.2	5.9	0.2	9	37.0	196265.82	Low

	Date	Maximum temperature (°C)	Minimum temperature (°C)	Temp_Gap (°C)	Rainfall (mm)	Direction of maximum wind gust	Speed of maximum wind gust (km/h)	TOTALDEMAND	Demand Category
	01-03								Demand
64	2023-01-04	18.7	15.0	3.7	0.0	11	52.0	194020.48	Low Demand
65	2023-01-05	21.6	14.1	7.5	1.0	9	39.0	186487.50	Low Demand
66	2023-01-06	25.6	13.3	12.3	0.0	6	37.0	181143.69	Low Demand
67	2023-01-07	30.2	13.2	17.0	0.0	8	28.0	188260.67	Low Demand
68	2023-01-08	31.9	14.9	17.0	0.0	7	24.0	208309.97	Medium Demand
69	2023-01-09	26.2	18.4	7.8	0.0	10	37.0	227583.62	High Demand
70	2023-01-10	21.6	16.9	4.7	0.0	10	35.0	210941.76	Medium-High Demand
71	2023-01-11	29.9	15.9	14.0	0.0	10	28.0	247650.19	High Demand
72	2023-01-12	24.0	18.7	5.3	0.0	10	28.0	240034.88	High Demand
73	2023-01-13	24.2	18.0	6.2	0.0	9	31.0	240990.92	High Demand
74	2023-01-14	37.6	20.2	17.4	0.0	16	43.0	261140.71	High Demand
75	2023-01-15	20.6	18.0	2.6	0.0	10	35.0	191367.64	Low Demand
76	2023-01-16	27.0	15.1	11.9	0.0	10	24.0	235423.13	High Demand
77	2023-01-17	37.2	16.3	20.9	0.0	15	48.0	291626.60	High Demand
78	2023-01-18	19.9	19.8	0.1	6.0	9	41.0	239143.86	High Demand
79	2023-01-19	19.3	14.7	4.6	4.6	10	41.0	200679.08	Medium Demand
80	2023-01-20	21.0	15.5	5.5	0.0	10	35.0	197552.89	Low Demand
81	2023-01-21	23.0	13.8	9.2	0.0	10	43.0	186401.03	Low Demand
82	2023-01-22	23.4	17.2	6.2	0.0	10	35.0	188658.53	Low Demand
83	2023-01-23	28.0	18.2	9.8	0.0	9	24.0	232309.48	High Demand
84	2023-01-24	28.6	17.6	11.0	0.0	10	41.0	240453.10	High Demand
85	2023-01-25	30.0	17.2	12.8	1.8	10	35.0	238191.45	High Demand
86	2023-	21.6	15.9	5.7	0.0	10	35.0	196093.88	Low

	Date	Maximum temperature (°C)	Minimum temperature (°C)	Temp Gap (°C)	Rainfall (mm)	Direction of maximum wind gust	Speed of maximum wind gust (km/h)	TOTALDEMAND	Demand Category
	01-26								
87	2023-01-27	26.8	13.5	13.3	0.0	9	24.0	213011.89	Medium-High Demand
88	2023-01-28	34.2	15.2	19.0	0.0	1	43.0	227026.87	High Demand
89	2023-01-29	23.8	19.5	4.3	0.2	10	24.0	219160.91	Medium-High Demand
90	2023-01-30	21.7	17.9	3.8	0.0	9	33.0	222605.22	Medium-High Demand
91	2023-01-31	22.2	15.6	6.6	0.0	9	30.0	214033.29	Medium-High Demand
92	2023-02-01	21.0	14.9	6.1	0.0	10	39.0	215754.73	Medium-High Demand
93	2023-02-02	21.3	14.2	7.1	0.2	16	56.0	208955.05	Medium Demand
94	2023-02-03	18.8	11.4	7.4	11.2	12	41.0	203144.36	Medium Demand
95	2023-02-04	20.7	11.7	9.0	6.6	10	31.0	190171.93	Low Demand
96	2023-02-05	19.8	13.8	6.0	1.2	8	26.0	191000.35	Low Demand
97	2023-02-06	20.9	16.0	4.9	0.0	10	28.0	209626.11	Medium Demand
98	2023-02-07	20.4	16.6	3.8	0.0	10	37.0	205595.06	Medium Demand
99	2023-02-08	22.2	15.0	7.2	0.0	9	33.0	204501.32	Medium Demand
100	2023-02-09	26.4	13.2	13.2	0.2	10	26.0	227856.33	High Demand
101	2023-02-10	26.7	16.2	10.5	0.0	10	28.0	234316.39	High Demand
102	2023-02-11	25.7	15.8	9.9	0.0	10	41.0	199583.93	Medium Demand
103	2023-02-12	20.7	17.3	3.4	0.0	9	46.0	178444.50	Low Demand
104	2023-02-13	20.9	15.8	5.1	0.0	10	37.0	205722.09	Medium Demand
105	2023-02-14	22.2	12.0	10.2	0.0	10	37.0	202646.01	Medium Demand
106	2023-02-15	32.4	12.6	19.8	0.0	1	31.0	238244.28	High Demand
107	2023-02-16	37.2	17.1	20.1	0.0	16	33.0	282225.01	High Demand

	Date	Maximum temperature (°C)	Minimum temperature (°C)	Temp Gap (°C)	Rainfall (mm)	Direction of maximum wind gust	Speed of maximum wind gust (km/h)	TOTALDEMAND	Demand Category
108	2023-02-17	40.5	22.8	17.7	0.0	16	46.0	292454.56	High Demand
109	2023-02-18	24.9	17.4	7.5	0.0	10	31.0	202981.15	Medium Demand
110	2023-02-19	27.9	14.9	13.0	0.0	9	30.0	200827.12	Medium Demand
111	2023-02-20	24.0	14.9	9.1	0.0	10	30.0	230070.63	High Demand
112	2023-02-21	22.2	17.7	4.5	0.0	8	39.0	211603.33	Medium-High Demand
113	2023-02-22	30.6	14.6	16.0	0.0	8	33.0	228512.92	High Demand
114	2023-02-23	32.4	17.5	14.9	0.0	1	44.0	250012.53	High Demand
115	2023-02-24	32.3	19.6	12.7	0.0	16	46.0	257630.11	High Demand
116	2023-02-25	26.7	22.2	4.5	0.0	1	28.0	230907.74	High Demand
117	2023-02-26	23.4	15.7	7.7	1.4	10	30.0	192488.50	Low Demand
118	2023-02-27	20.2	16.3	3.9	2.6	10	33.0	226967.78	High Demand
119	2023-02-28	17.6	16.5	1.1	0.2	10	28.0	235938.26	High Demand
120	2023-03-01	21.1	14.3	6.8	3.2	10	28.0	215509.91	Medium-High Demand
121	2023-03-02	21.7	14.5	7.2	0.8	10	26.0	226022.63	High Demand
122	2023-03-03	19.8	15.5	4.3	0.2	10	35.0	203617.96	Medium Demand
123	2023-03-04	31.4	14.1	17.3	0.0	2	31.0	211652.58	Medium-High Demand
124	2023-03-05	32.9	16.5	16.4	0.0	16	44.0	209685.59	Medium Demand
125	2023-03-06	25.3	15.5	9.8	5.6	16	50.0	205872.87	Medium Demand
126	2023-03-07	23.2	15.4	7.8	0.0	16	50.0	205449.17	Medium Demand
127	2023-03-08	19.4	12.3	7.1	1.0	15	48.0	208303.92	Medium Demand
128	2023-03-09	22.1	12.9	9.2	0.0	13	31.0	215852.44	Medium-High Demand
129	2023-03-10	24.0	14.5	9.5	0.0	8	28.0	217330.83	Medium-High

	Date	Maximum temperature (°C)	Minimum temperature (°C)	Temp_Gap (°C)	Rainfall (mm)	Direction of maximum wind gust	Speed of maximum wind gust (km/h)	TOTALDEMAND	Demand Category
Demand									
130	2023-03-11	24.7	13.3	11.4	0.0	10	31.0	193814.23	Low Demand
131	2023-03-12	20.7	15.5	5.2	0.0	10	37.0	189261.58	Low Demand
132	2023-03-13	22.4	11.7	10.7	0.0	9	30.0	184580.68	Low Demand
133	2023-03-14	30.5	15.9	14.6	0.0	16	31.0	235775.69	High Demand
134	2023-03-15	22.9	17.6	5.3	0.0	10	24.0	236382.34	High Demand
135	2023-03-16	28.5	17.3	11.2	0.0	12	39.0	225502.20	High Demand
136	2023-03-17	24.6	15.8	8.8	2.6	10	28.0	214801.61	Medium-High Demand
137	2023-03-18	36.2	14.6	21.6	0.0	1	52.0	210252.46	Medium Demand
138	2023-03-19	19.0	17.3	1.7	0.0	10	28.0	201149.18	Medium Demand
139	2023-03-20	20.8	14.9	5.9	0.0	10	41.0	194041.03	Low Demand
140	2023-03-21	19.4	11.7	7.7	0.0	6	17.0	231999.15	High Demand
141	2023-03-22	22.8	13.5	9.3	1.6	10	24.0	221984.14	Medium-High Demand
142	2023-03-23	22.6	15.3	7.3	10.2	14	24.0	225840.46	High Demand
143	2023-03-24	21.6	16.1	5.5	1.4	8	31.0	217074.13	Medium-High Demand
144	2023-03-25	19.6	11.6	8.0	0.2	9	33.0	186349.72	Low Demand
145	2023-03-26	19.9	10.7	9.2	0.0	9	20.0	196532.05	Low Demand
146	2023-03-27	18.3	13.9	4.4	0.0	1	26.0	234995.41	High Demand
147	2023-03-28	20.9	15.5	5.4	8.0	10	24.0	221450.78	Medium-High Demand
148	2023-03-29	18.5	14.9	3.6	5.8	9	43.0	220201.07	Medium-High Demand
149	2023-03-30	19.1	12.4	6.7	8.2	12	31.0	214537.48	Medium-High Demand
150	2023-03-31	19.4	14.1	5.3	0.0	9	33.0	218042.04	Medium-High

	Date	Maximum temperature (°C)	Minimum temperature (°C)	Temp Gap (°C)	Rainfall (mm)	Direction of maximum wind gust	Speed of maximum wind gust (km/h)	TOTALDEMAND	Demand Category
									Demand
151	2023-04-01	16.4	11.3	5.1	4.6	8	33.0	201312.20	Medium Demand
152	2023-04-02	18.3	8.7	9.6	0.2	9	22.0	188202.90	Low Demand
153	2023-04-03	22.6	8.8	13.8	0.0	10	19.0	217818.15	Medium-High Demand
154	2023-04-04	21.7	12.0	9.7	0.0	10	28.0	215835.54	Medium-High Demand
155	2023-04-05	18.4	13.8	4.6	0.0	10	22.0	226688.80	High Demand
156	2023-04-06	26.3	13.4	12.9	0.0	16	43.0	221274.71	Medium-High Demand
157	2023-04-07	19.9	16.1	3.8	4.4	1	41.0	195491.72	Low Demand
158	2023-04-08	18.0	13.7	4.3	11.2	11	35.0	184030.16	Low Demand
159	2023-04-09	15.5	10.5	5.0	7.8	10	43.0	195693.53	Low Demand
160	2023-04-10	15.2	10.1	5.1	14.8	9	35.0	211534.73	Medium-High Demand
161	2023-04-11	19.1	11.9	7.2	6.0	10	19.0	217760.14	Medium-High Demand
162	2023-04-12	19.3	12.6	6.7	7.0	1	41.0	224897.12	Medium-High Demand
163	2023-04-13	22.8	11.2	11.6	4.4	5	28.0	216632.17	Medium-High Demand
164	2023-04-14	25.4	10.8	14.6	0.0	16	20.0	204922.00	Medium Demand
165	2023-04-15	21.2	13.8	7.4	0.0	16	54.0	204600.36	Medium Demand
166	2023-04-16	17.2	12.1	5.1	38.4	10	35.0	196361.29	Low Demand
167	2023-04-17	20.7	8.7	12.0	2.0	1	24.0	226023.04	High Demand
168	2023-04-18	22.8	13.4	9.4	0.0	16	35.0	208423.60	Medium Demand
169	2023-04-19	17.5	14.4	3.1	1.2	11	28.0	221162.63	Medium-High Demand
170	2023-04-20	18.5	7.8	10.7	0.0	10	17.0	227894.85	High Demand

	Date	Maximum temperature (°C)	Minimum temperature (°C)	Temp_Gap (°C)	Rainfall (mm)	Direction of maximum wind gust	Speed of maximum wind gust (km/h)	TOTALDEMAND	Demand Category
171	2023-04-21	19.0	11.3	7.7	0.0	10	13.0	232037.55	High Demand
172	2023-04-22	19.2	14.6	4.6	0.0	10	22.0	207268.41	Medium Demand
173	2023-04-23	19.0	14.8	4.2	0.0	10	26.0	195457.58	Low Demand

```
In [15]: mapping_dict = {"Low Demand": 1, "Medium Demand": 2, "Medium-High Demand": 3, "High Demand": 4}
merged_df["Demand Category"] = merged_df["Demand Category"].map(mapping_dict)
merged_df
```

Out[15]:

	Date	Maximum temperature (°C)	Minimum temperature (°C)	Temp_Gap (°C)	Rainfall (mm)	Direction of maximum wind gust	Speed of maximum wind gust (km/h)	TOTALDEMAND	Demand Category
0	2022-11-01	13.3	8.5	4.8	3.0	11	44.0	211901.76	3
1	2022-11-02	15.7	6.9	8.8	2.8	10	43.0	233820.15	4
2	2022-11-03	15.4	9.1	6.3	0.4	10	31.0	235757.80	4
3	2022-11-04	17.8	10.2	7.6	0.2	9	24.0	224741.55	3
4	2022-11-05	22.7	11.8	10.9	0.0	1	31.0	188763.75	1
5	2022-11-06	27.1	11.6	15.5	0.0	16	33.0	177545.00	1
6	2022-11-07	25.9	13.9	12.0	0.0	13	24.0	210882.69	2
7	2022-11-08	27.6	14.6	13.0	0.0	16	35.0	215055.25	3
8	2022-11-09	29.3	15.6	13.7	2.8	2	35.0	216311.19	3
9	2022-11-10	26.4	19.8	6.6	0.0	16	54.0	222407.58	3
10	2022-11-11	20.2	18.7	1.5	3.0	10	30.0	223766.52	3
11	2022-11-12	19.3	14.2	5.1	0.0	10	26.0	188037.61	1
12	2022-11-13	24.8	15.4	9.4	6.6	1	44.0	186450.69	1
13	2022-11-14	17.4	13.0	4.4	13.6	10	41.0	210249.26	2
14	2022-11-15	13.1	8.0	5.1	14.2	11	43.0	222929.51	3
15	2022-11-16	14.8	7.2	7.6	0.6	9	43.0	229488.59	4
16	2022-11-17	16.3	9.6	6.7	3.2	10	33.0	229492.69	4
17	2022-11-18	24.5	7.2	17.3	0.0	16	28.0	201630.49	2
18	2022-11-19	22.3	12.5	9.8	0.0	1	59.0	193603.58	1
19	2022-11-20	20.6	11.8	8.8	16.0	16	50.0	170247.19	1
20	2022-11-21	13.8	9.4	4.4	1.2	13	57.0	221642.42	3
21	2022-11-22	18.2	8.7	9.5	2.0	14	37.0	226308.18	4
22	2022-11-23	17.7	11.6	6.1	0.6	10	30.0	217645.81	3

	Date	Maximum temperature (°C)	Minimum temperature (°C)	Temp_Gap (°C)	Rainfall (mm)	Direction of maximum wind gust	Speed of maximum wind gust (km/h)	TOTALDEMAND	Demand Category
23	2022-11-24	19.2	12.4	6.8	2.8	8	22.0	216516.55	3
24	2022-11-25	20.6	11.6	9.0	0.0	9	22.0	204648.00	2
25	2022-11-26	27.3	10.9	16.4	0.0	1	54.0	179835.07	1
26	2022-11-27	20.5	14.7	5.8	0.2	10	37.0	175277.76	1
27	2022-11-28	18.8	9.7	9.1	0.2	15	31.0	203457.19	2
28	2022-11-29	18.4	12.2	6.2	0.4	9	33.0	199068.66	2
29	2022-11-30	18.4	11.6	6.8	0.0	10	31.0	203541.68	2
30	2022-12-01	18.8	12.1	6.7	0.0	9	35.0	205941.30	2
31	2022-12-02	21.4	9.4	12.0	0.0	10	26.0	202255.43	2
32	2022-12-03	31.0	13.6	17.4	0.0	16	31.0	207232.32	2
33	2022-12-04	34.5	17.3	17.2	0.0	15	44.0	218784.81	3
34	2022-12-05	18.1	16.2	1.9	0.0	10	52.0	213657.54	3
35	2022-12-06	20.0	13.4	6.6	1.2	9	31.0	208853.77	2
36	2022-12-07	19.3	13.1	6.2	0.2	11	41.0	204581.10	2
37	2022-12-08	16.0	9.4	6.6	0.6	9	48.0	209312.78	2
38	2022-12-09	17.6	9.9	7.7	2.4	9	41.0	203747.71	2
39	2022-12-10	25.9	8.1	17.8	0.0	1	31.0	183208.67	1
40	2022-12-11	28.6	14.0	14.6	0.0	1	54.0	195535.11	1
41	2022-12-12	17.3	11.5	5.8	17.4	15	44.0	207573.50	2
42	2022-12-13	17.9	11.6	6.3	3.2	16	44.0	216831.57	3
43	2022-12-14	15.8	9.0	6.8	6.2	9	50.0	213994.46	3
44	2022-12-15	16.6	11.1	5.5	3.4	9	39.0	210373.91	2
45	2022-12-16	20.3	10.8	9.5	0.0	7	35.0	197818.30	1

	Date	Maximum temperature (°C)	Minimum temperature (°C)	Temp_Gap (°C)	Rainfall (mm)	Direction of maximum wind gust	Speed of maximum wind gust (km/h)	TOTALDEMAND	Demand Category
46	2022-12-17	22.3	10.9	11.4	0.2	8	41.0	171851.19	1
47	2022-12-18	23.7	11.7	12.0	0.0	6	37.0	159424.24	1
48	2022-12-19	26.0	9.8	16.2	0.0	8	33.0	192147.24	1
49	2022-12-20	27.3	10.2	17.1	0.0	8	31.0	199573.40	2
50	2022-12-21	29.4	12.9	16.5	0.0	2	30.0	214232.67	3
51	2022-12-22	25.2	16.8	8.4	5.2	1	26.0	221856.58	3
52	2022-12-23	23.1	15.7	7.4	1.6	11	28.0	205292.66	2
53	2022-12-24	23.5	16.7	6.8	0.0	9	31.0	178444.61	1
54	2022-12-25	31.9	12.9	19.0	0.0	10	24.0	182847.14	1
55	2022-12-26	27.5	17.0	10.5	0.0	10	28.0	211872.74	3
56	2022-12-27	37.3	17.7	19.6	0.0	1	33.0	257182.12	4
57	2022-12-28	27.6	25.0	2.6	0.0	1	46.0	227635.71	4
58	2022-12-29	19.3	14.0	5.3	0.8	8	33.0	180829.31	1
59	2022-12-30	26.2	12.6	13.6	0.0	10	30.0	195693.50	1
60	2022-12-31	30.3	17.9	12.4	0.0	8	30.0	206057.80	2
61	2023-01-01	35.9	18.4	17.5	0.0	1	31.0	240668.82	4
62	2023-01-02	32.0	22.1	9.9	6.4	1	52.0	226557.25	4
63	2023-01-03	21.1	15.2	5.9	0.2	9	37.0	196265.82	1
64	2023-01-04	18.7	15.0	3.7	0.0	11	52.0	194020.48	1
65	2023-01-05	21.6	14.1	7.5	1.0	9	39.0	186487.50	1
66	2023-01-06	25.6	13.3	12.3	0.0	6	37.0	181143.69	1
67	2023-01-07	30.2	13.2	17.0	0.0	8	28.0	188260.67	1
68	2023-01-08	31.9	14.9	17.0	0.0	7	24.0	208309.97	2

	Date	Maximum temperature (°C)	Minimum temperature (°C)	Temp_Gap (°C)	Rainfall (mm)	Direction of maximum wind gust	Speed of maximum wind gust (km/h)	TOTALDEMAND	Demand Category
69	2023-01-09	26.2	18.4	7.8	0.0	10	37.0	227583.62	4
70	2023-01-10	21.6	16.9	4.7	0.0	10	35.0	210941.76	3
71	2023-01-11	29.9	15.9	14.0	0.0	10	28.0	247650.19	4
72	2023-01-12	24.0	18.7	5.3	0.0	10	28.0	240034.88	4
73	2023-01-13	24.2	18.0	6.2	0.0	9	31.0	240990.92	4
74	2023-01-14	37.6	20.2	17.4	0.0	16	43.0	261140.71	4
75	2023-01-15	20.6	18.0	2.6	0.0	10	35.0	191367.64	1
76	2023-01-16	27.0	15.1	11.9	0.0	10	24.0	235423.13	4
77	2023-01-17	37.2	16.3	20.9	0.0	15	48.0	291626.60	4
78	2023-01-18	19.9	19.8	0.1	6.0	9	41.0	239143.86	4
79	2023-01-19	19.3	14.7	4.6	4.6	10	41.0	200679.08	2
80	2023-01-20	21.0	15.5	5.5	0.0	10	35.0	197552.89	1
81	2023-01-21	23.0	13.8	9.2	0.0	10	43.0	186401.03	1
82	2023-01-22	23.4	17.2	6.2	0.0	10	35.0	188658.53	1
83	2023-01-23	28.0	18.2	9.8	0.0	9	24.0	232309.48	4
84	2023-01-24	28.6	17.6	11.0	0.0	10	41.0	240453.10	4
85	2023-01-25	30.0	17.2	12.8	1.8	10	35.0	238191.45	4
86	2023-01-26	21.6	15.9	5.7	0.0	10	35.0	196093.88	1
87	2023-01-27	26.8	13.5	13.3	0.0	9	24.0	213011.89	3
88	2023-01-28	34.2	15.2	19.0	0.0	1	43.0	227026.87	4
89	2023-01-29	23.8	19.5	4.3	0.2	10	24.0	219160.91	3
90	2023-01-30	21.7	17.9	3.8	0.0	9	33.0	222605.22	3
91	2023-01-31	22.2	15.6	6.6	0.0	9	30.0	214033.29	3

	Date	Maximum temperature (°C)	Minimum temperature (°C)	Temp Gap (°C)	Rainfall (mm)	Direction of maximum wind gust	Speed of maximum wind gust (km/h)	TOTALDEMAND	Demand Category
92	2023-02-01	21.0	14.9	6.1	0.0	10	39.0	215754.73	3
93	2023-02-02	21.3	14.2	7.1	0.2	16	56.0	208955.05	2
94	2023-02-03	18.8	11.4	7.4	11.2	12	41.0	203144.36	2
95	2023-02-04	20.7	11.7	9.0	6.6	10	31.0	190171.93	1
96	2023-02-05	19.8	13.8	6.0	1.2	8	26.0	191000.35	1
97	2023-02-06	20.9	16.0	4.9	0.0	10	28.0	209626.11	2
98	2023-02-07	20.4	16.6	3.8	0.0	10	37.0	205595.06	2
99	2023-02-08	22.2	15.0	7.2	0.0	9	33.0	204501.32	2
100	2023-02-09	26.4	13.2	13.2	0.2	10	26.0	227856.33	4
101	2023-02-10	26.7	16.2	10.5	0.0	10	28.0	234316.39	4
102	2023-02-11	25.7	15.8	9.9	0.0	10	41.0	199583.93	2
103	2023-02-12	20.7	17.3	3.4	0.0	9	46.0	178444.50	1
104	2023-02-13	20.9	15.8	5.1	0.0	10	37.0	205722.09	2
105	2023-02-14	22.2	12.0	10.2	0.0	10	37.0	202646.01	2
106	2023-02-15	32.4	12.6	19.8	0.0	1	31.0	238244.28	4
107	2023-02-16	37.2	17.1	20.1	0.0	16	33.0	282225.01	4
108	2023-02-17	40.5	22.8	17.7	0.0	16	46.0	292454.56	4
109	2023-02-18	24.9	17.4	7.5	0.0	10	31.0	202981.15	2
110	2023-02-19	27.9	14.9	13.0	0.0	9	30.0	200827.12	2
111	2023-02-20	24.0	14.9	9.1	0.0	10	30.0	230070.63	4
112	2023-02-21	22.2	17.7	4.5	0.0	8	39.0	211603.33	3
113	2023-02-22	30.6	14.6	16.0	0.0	8	33.0	228512.92	4
114	2023-02-23	32.4	17.5	14.9	0.0	1	44.0	250012.53	4

	Date	Maximum temperature (°C)	Minimum temperature (°C)	Temp_Gap (°C)	Rainfall (mm)	Direction of maximum wind gust	Speed of maximum wind gust (km/h)	TOTALDEMAND	Demand Category
115	2023-02-24	32.3	19.6	12.7	0.0	16	46.0	257630.11	4
116	2023-02-25	26.7	22.2	4.5	0.0	1	28.0	230907.74	4
117	2023-02-26	23.4	15.7	7.7	1.4	10	30.0	192488.50	1
118	2023-02-27	20.2	16.3	3.9	2.6	10	33.0	226967.78	4
119	2023-02-28	17.6	16.5	1.1	0.2	10	28.0	235938.26	4
120	2023-03-01	21.1	14.3	6.8	3.2	10	28.0	215509.91	3
121	2023-03-02	21.7	14.5	7.2	0.8	10	26.0	226022.63	4
122	2023-03-03	19.8	15.5	4.3	0.2	10	35.0	203617.96	2
123	2023-03-04	31.4	14.1	17.3	0.0	2	31.0	211652.58	3
124	2023-03-05	32.9	16.5	16.4	0.0	16	44.0	209685.59	2
125	2023-03-06	25.3	15.5	9.8	5.6	16	50.0	205872.87	2
126	2023-03-07	23.2	15.4	7.8	0.0	16	50.0	205449.17	2
127	2023-03-08	19.4	12.3	7.1	1.0	15	48.0	208303.92	2
128	2023-03-09	22.1	12.9	9.2	0.0	13	31.0	215852.44	3
129	2023-03-10	24.0	14.5	9.5	0.0	8	28.0	217330.83	3
130	2023-03-11	24.7	13.3	11.4	0.0	10	31.0	193814.23	1
131	2023-03-12	20.7	15.5	5.2	0.0	10	37.0	189261.58	1
132	2023-03-13	22.4	11.7	10.7	0.0	9	30.0	184580.68	1
133	2023-03-14	30.5	15.9	14.6	0.0	16	31.0	235775.69	4
134	2023-03-15	22.9	17.6	5.3	0.0	10	24.0	236382.34	4
135	2023-03-16	28.5	17.3	11.2	0.0	12	39.0	225502.20	4
136	2023-03-17	24.6	15.8	8.8	2.6	10	28.0	214801.61	3
137	2023-03-18	36.2	14.6	21.6	0.0	1	52.0	210252.46	2

	Date	Maximum temperature (°C)	Minimum temperature (°C)	Temp_Gap (°C)	Rainfall (mm)	Direction of maximum wind gust	Speed of maximum wind gust (km/h)	TOTALDEMAND	Demand Category
138	2023-03-19	19.0	17.3	1.7	0.0	10	28.0	201149.18	2
139	2023-03-20	20.8	14.9	5.9	0.0	10	41.0	194041.03	1
140	2023-03-21	19.4	11.7	7.7	0.0	6	17.0	231999.15	4
141	2023-03-22	22.8	13.5	9.3	1.6	10	24.0	221984.14	3
142	2023-03-23	22.6	15.3	7.3	10.2	14	24.0	225840.46	4
143	2023-03-24	21.6	16.1	5.5	1.4	8	31.0	217074.13	3
144	2023-03-25	19.6	11.6	8.0	0.2	9	33.0	186349.72	1
145	2023-03-26	19.9	10.7	9.2	0.0	9	20.0	196532.05	1
146	2023-03-27	18.3	13.9	4.4	0.0	1	26.0	234995.41	4
147	2023-03-28	20.9	15.5	5.4	8.0	10	24.0	221450.78	3
148	2023-03-29	18.5	14.9	3.6	5.8	9	43.0	220201.07	3
149	2023-03-30	19.1	12.4	6.7	8.2	12	31.0	214537.48	3
150	2023-03-31	19.4	14.1	5.3	0.0	9	33.0	218042.04	3
151	2023-04-01	16.4	11.3	5.1	4.6	8	33.0	201312.20	2
152	2023-04-02	18.3	8.7	9.6	0.2	9	22.0	188202.90	1
153	2023-04-03	22.6	8.8	13.8	0.0	10	19.0	217818.15	3
154	2023-04-04	21.7	12.0	9.7	0.0	10	28.0	215835.54	3
155	2023-04-05	18.4	13.8	4.6	0.0	10	22.0	226688.80	4
156	2023-04-06	26.3	13.4	12.9	0.0	16	43.0	221274.71	3
157	2023-04-07	19.9	16.1	3.8	4.4	1	41.0	195491.72	1
158	2023-04-08	18.0	13.7	4.3	11.2	11	35.0	184030.16	1
159	2023-04-09	15.5	10.5	5.0	7.8	10	43.0	195693.53	1
160	2023-04-10	15.2	10.1	5.1	14.8	9	35.0	211534.73	3

	Date	Maximum temperature (°C)	Minimum temperature (°C)	Temp_Gap (°C)	Rainfall (mm)	Direction of maximum wind gust	Speed of maximum wind gust (km/h)	TOTALDEMAND	Demand Category
161	2023-04-11	19.1	11.9	7.2	6.0	10	19.0	217760.14	3
162	2023-04-12	19.3	12.6	6.7	7.0	1	41.0	224897.12	3
163	2023-04-13	22.8	11.2	11.6	4.4	5	28.0	216632.17	3
164	2023-04-14	25.4	10.8	14.6	0.0	16	20.0	204922.00	2
165	2023-04-15	21.2	13.8	7.4	0.0	16	54.0	204600.36	2
166	2023-04-16	17.2	12.1	5.1	38.4	10	35.0	196361.29	1
167	2023-04-17	20.7	8.7	12.0	2.0	1	24.0	226023.04	4
168	2023-04-18	22.8	13.4	9.4	0.0	16	35.0	208423.60	2
169	2023-04-19	17.5	14.4	3.1	1.2	11	28.0	221162.63	3
170	2023-04-20	18.5	7.8	10.7	0.0	10	17.0	227894.85	4
171	2023-04-21	19.0	11.3	7.7	0.0	10	13.0	232037.55	4
172	2023-04-22	19.2	14.6	4.6	0.0	10	22.0	207268.41	2
173	2023-04-23	19.0	14.8	4.2	0.0	10	26.0	195457.58	1

```
In [16]: missing_values3 = merged_df.isnull().sum()

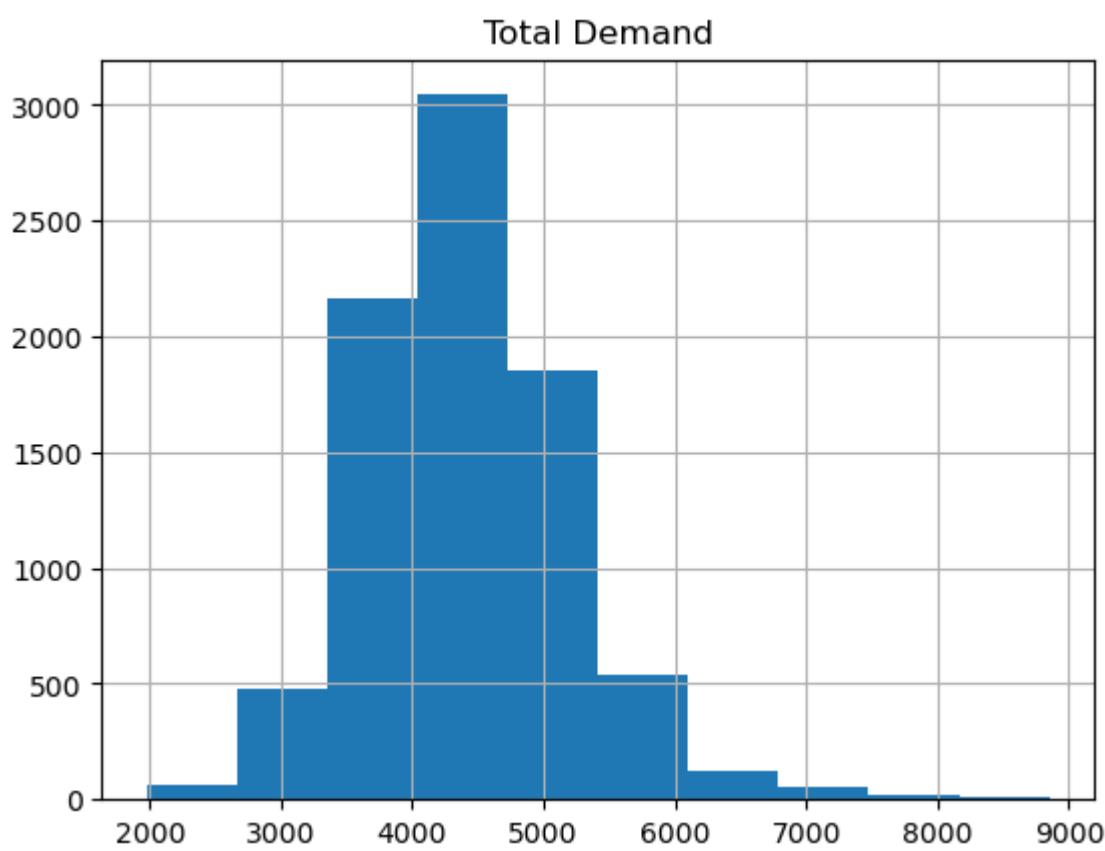
missing_values3
```

```
Out[16]: Date          0
Maximum temperature (°C) 0
Minimum temperature (°C) 0
Temp_Gap (°C) 0
Rainfall (mm) 0
Direction of maximum wind gust 0
Speed of maximum wind gust (km/h) 0
TOTALDEMAND 0
Demand Category 0
dtype: int64
```

Binning

```
In [17]: import matplotlib.pyplot as plt

data['TOTALDEMAND'].hist()
plt.title('Total Demand')
plt.show()
```



Decision Tree Classifier

In [18]:

```
import pandas as pd
from sklearn.tree import DecisionTreeClassifier
from sklearn.model_selection import train_test_split

features = merged_df[['Temp_Gap (°C)']]
classlabel = merged_df['Demand Category']

features_train, features_test, classlabel_train, classlabel_test = train_test_split(features,
                                         classlabel,
                                         test_size=0.2,
                                         random_state=42)

dt = DecisionTreeClassifier(criterion='entropy', random_state=1)
dt.fit(features, classlabel)
```

Out[18]:

```
DecisionTreeClassifier
DecisionTreeClassifier(criterion='entropy', random_state=1)
```

In [19]:

```
from sklearn.metrics import accuracy_score
predictions = dt.predict(features)
print(accuracy_score(classlabel, predictions))

0.6724137931034483
```

In [20]:

```
from sklearn import tree
from matplotlib import pyplot as plt
plt.figure(figsize = (15, 15))
tree.plot_tree(dt)
plt.show()
```

