

## **01**

**Title:** “Analysis and Visualization of Hourly Weather Data for NYC Airports (2013)”

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**Public Repository:** “<https://github.com/SriVinayaka/Vinay-Srinivasan-SIG-731-Task-6D/>”

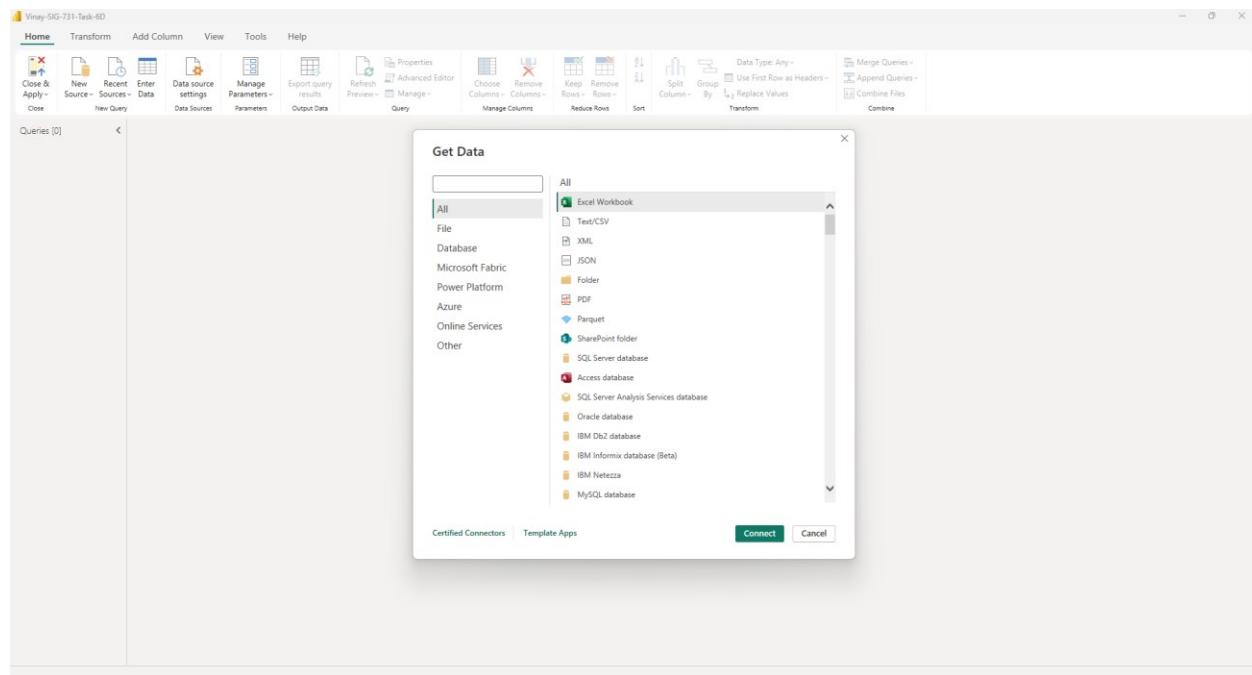
## **02. Data Source**

- Dataset: nycflights13\_weather.csv.gz
- Extracted file used: weather.csv
- Data description: Hourly meteorological observations for **LGA, JFK, EWR** during 2013
- Convert the weather.csv to raw\_weather.xlsx
- Remove the top 42 rows containing the “R” program markers

## **03. Load Data into Power BI Desktop**

1. Open **Power BI Desktop**
2. **Home → Get Data → ‘Excel Workbook’**
3. Select ‘raw\_weather.xlsx’
4. Click **Transform Data** (do NOT load directly)

All processing from now on is done in **Power Query Editor** ✓



## Navigator

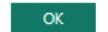
Display Options 

raw\_weather.xlsx [1]  

raw\_weather  

raw\_weather

origin	year	month	day	hour	temp	dewp	hum
EWR	2013	1	1	0	37.04	21.92	
EWR	2013	1	1	1	37.04	21.92	
EWR	2013	1	1	2	37.94	21.92	
EWR	2013	1	1	3	37.94	23	
EWR	2013	1	1	4	37.94	24.08	
EWR	2013	1	1	6	39.02	26.06	
EWR	2013	1	1	7	39.02	26.96	
EWR	2013	1	1	8	39.02	28.04	
EWR	2013	1	1	9	39.92	28.04	
EWR	2013	1	1	10	39.02	28.04	
EWR	2013	1	1	11	37.94	28.04	
EWR	2013	1	1	12	39.02	28.04	
EWR	2013	1	1	13	39.92	28.04	
EWR	2013	1	1	14	39.92	28.04	
EWR	2013	1	1	15	41	28.04	
EWR	2013	1	1	16	41	26.96	
EWR	2013	1	1	17	39.2	28.4	
EWR	2013	1	1	18	39.2	28.4	
EWR	2013	1	1	19	39.02	24.08	
EWR	2013	1	1	20	37.94	24.08	
EWR	2013	1	1	21	37.04	19.94	
EWR	2013	1	1	22	35.96	19.04	
EWR	2013	1	1	23	33.98	15.08	

 OK  Cancel

## 04. Correct the Time Bug (CRITICAL)

The time\_hour column is shifted by +1 hour and must NOT be trusted

```

1 let
2     Source = Excel.Workbook(File.Contents("D:\power-bi\SI0-731-Task-60\data\raw_weather.xlsx"), null, true),
3     raw_weather_Sheet = Source[[Item="raw_weather",Kind="Sheet"]][Data],
4     #"Promoted Headers" = Table.PromoteHeaders(raw_weather_Sheet, [PromoteAllScalars=true]),
5     #"Changed Type" = Table.TransformColumnTypes(#"Promoted Headers",{{"origin", type text}, {"year", Int64.Type}, {"month", Int64.Type}, {"day", Int64.Type}, {"hour", Int64.Type}, {"temp", type number}, {"dewp", type number}, {"humid", type number}, {"wind_dir", type any}, {"wind_speed", type number}, {"wind_gust", type number}, {"precip", Int64.Type}, {"pressure", type any}, {"visib", Int64.Type}, {"time_hour", type datetime}}),
6     #"Changed Type"
7 in

```

No syntax errors have been detected.

15 COLUMNS, 999+ ROWS - Column profiling based on top 1000 rows

	dewp	1.2 humid	1.2 wind_dir	1.2 wind_speed	1.2 wind_gust	1.2 precip	1.2 pressure	1.2 visib	time_hour
1	21.92	53.97	230	10.93702	11.91865148	0	1011.9	10	1/1/2013 1:00:00 AM
2	21.92	53.97	230	11.80938	15.8915533	0	1011.9	10	1/1/2013 2:00:00 AM
3	21.92	52.09	230	12.65358	14.56724069	0	1012.6	10	1/1/2013 3:00:00 AM
4	23	54.51	230	13.80936	15.8915533	0	1012.7	10	1/1/2013 4:00:00 AM
5	24.08	57.04	240	14.96024	17.21582991	0	1012.8	10	1/1/2013 5:00:00 AM
6	26.06	59.37	270	10.93702	11.91865148	0	1012	10	1/1/2013 7:00:00 AM
7	26.96	61.63	250	8.05546	9.70096259	0	1012.3	10	1/1/2013 8:00:00 AM
8	28.04	64.43	240	11.5079	13.24234608	0	1012.5	10	1/1/2013 9:00:00 AM
9	28.04	62.21	250	12.65358	14.56724069	0	1012.2	10	1/1/2013 10:00:00 AM
10	28.04	64.43	260	12.65358	14.56724069	0	1011.9	10	1/1/2013 11:00:00 AM
11	28.04	67.21	240	11.5079	13.24234608	0	1012.4	10	1/1/2013 12:00:00 PM
12	28.04	64.43	240	14.96024	17.21582991	0	1012.2	10	1/1/2013 1:00:00 PM
13	28.04	62.21	250	10.93702	11.91865148	0	1012.2	10	1/1/2013 2:00:00 PM
14	28.04	62.21	260	14.96024	17.21582991	0	1012.7	10	1/1/2013 3:00:00 PM
15	28.04	59.63	260	13.80936	15.8915533	0	1012.4	10	1/1/2013 4:00:00 PM
16	26.96	57.06	260	14.96024	17.21582991	0	1011.4	10	1/1/2013 5:00:00 PM
17	28.4	64.93	270	14.11092	18.54012452	0 NA		10	1/1/2013 6:00:00 PM
18	28.4	64.93	330	14.96024	17.21582991	0 NA		10	1/1/2013 7:00:00 PM
19	24.08	54.83	280	13.80936	15.8915533	0	1010.8	10	1/2/2013 1:00:00 PM
20	24.08	57.06	290	9.26024	15.8915533	0	1011.9	10	1/2/2013 9:00:00 PM
21	28.94	49.62	330	13.80936	15.8915533	0	1012.1	10	1/2/2013 10:00:00 PM
22	28.04	49.63	330	11.5079	13.24234608	0	1013.2	10	1/2/2013 11:00:00 PM
23	25.08	45.43	310	12.65358	14.56724069	0	1014.1	10	1/2/2013 12:00:00 AM
24	22.93	43.84	320	10.93702	11.91865148	0	1014.4	10	1/2/2013 1:00:00 AM
25	25.08	49.19	310	14.96024	17.21582991	0	1015.2	10	1/2/2013 2:00:00 AM
26	22.93	48.48	320	18.41248	21.18871373	0	1016.8	10	1/2/2013 3:00:00 AM
27	12.02	48.69	320	18.41248	21.18871373	0	1016.5	10	1/2/2013 4:00:00 AM
	12.92								

PREVIEW DOWNLOADED ON SATURDAY

Advanced Editor

### raw\_weather

```

1 let
2     // 1. Load Excel workbook
3     Source = Excel.Workbook(
4         File.Contents("D:\power-bi\SIG-731-Task-60\data\raw_weather.xlsx"),
5         null,
6         true
7     ),
8
9     // 2. Select the raw_weather sheet
10    RawweatherSheet = Source[[Item="raw_weather", Kind="Sheet"]][Data],
11
12    // 3. Promote first row as headers
13    PromotedHeaders = Table.PromoteHeaders(
14        RawweatherSheet,
15        [PromoteAllScalars=true]
16    ),
17
18    // 4. Correct data types (FTZD)
19    ChangedTypes = Table.TransformColumnTypes(
20        PromotedHeaders,
21        [
22            {"[origin]", type text},
23            {"[year]", Int64.Type},
24            {"[month]", Int64.Type},
25            {"[day]", Int64.Type},
26            {"[hour]", Int64.Type},
27            {"[temp]", type number},
28            {"[dewp]", type number},
29            {"[humid]", type number},
30            {"[wind_dir]", Int64.Type},
31            {"[wind_speed]", type number},
32            {"[wind_gust]", type number},
33            {"[precip]", type number},
34            {"[pressure]", type number},
35            {"[visibl]", type number},
36            {"[time_hour]", type datetime}
37        ]
38    );
39
40    // 5. Create corrected datetime column (BEST PRACTICE)
41    AddedCorrectedDateTime = Table.AddColumn(
42        ChangedTypes,
43        "CorrectedTime",
44        each #datetime([year], [month], [day], [hour], 0, 0),
45        type datetime
46    )
47
48 in
49    AddedCorrectedDateTime
50
51

```

No syntax errors have been detected.

Display Options

Done Cancel

Vine-SIG-731-Task-60

Home Transform Add Column View Tools Help

Close & Apply - New Recent Data source settings Manage Parameters Export results Refresh Preview Properties Choose Columns - Remove Columns - Keep Rows - Remove Rows - Split Column - Group By Replace Values Transform Merge Queries - Append Queries - Combine Files

Queries [1] raw\_weather

Table [1 rows] | ChangeTypes, "CorrectedTime", each #datetime([year], [month], [day], [hour], 0, 0), type datetime

	[origin]	[2 wind_dir]	[2 wind speed]	[2 wind_gust]	[2 precip]	[2 pressure]	[2 visibl]	[time_hour]	CorrectedTime
1	53.97	230	10.35702	11.91805148	0	1013.9	10	1/2/2013 1:00:00 AM	1/2/2013 12:00:00 AM
2	53.97	230	13.80936	15.8915335	0	1013	10	1/2/2013 2:00:00 AM	1/2/2013 1:00:00 AM
3	52.09	230	10.35702	13.9523335	0	1012.8	10	1/2/2013 3:00:00 AM	1/2/2013 2:00:00 AM
4	54.51	230	13.80936	15.8915335	0	1012.7	10	1/2/2013 4:00:00 AM	1/2/2013 3:00:00 AM
5	57.04	240	14.96014	17.21582991	0	1012.8	10	1/2/2013 5:00:00 AM	1/2/2013 4:00:00 AM
6	58.87	270	10.35702	11.91805148	0	1012	10	1/2/2013 6:00:00 AM	1/2/2013 5:00:00 AM
7	61.63	250	8.05546	9.270952359	0	1012.3	10	1/2/2013 8:00:00 AM	1/2/2013 7:00:00 AM
8	64.43	240	11.5078	12.42494608	0	1012.5	10	1/2/2013 9:00:00 AM	1/2/2013 8:00:00 AM
9	62.21	250	12.65658	14.5073409	0	1012.3	10	1/2/2013 10:00:00 AM	1/2/2013 9:00:00 AM
10	64.43	260	12.65658	14.5073409	0	1011.9	10	1/2/2013 11:00:00 AM	1/2/2013 10:00:00 AM
11	67.21	240	11.5078	12.42494608	0	1012.4	10	1/2/2013 12:00:00 PM	1/2/2013 11:00:00 AM
12	64.43	240	14.96014	17.21582991	0	1012.2	10	1/2/2013 1:00:00 PM	1/2/2013 12:00:00 PM
13	62.21	250	10.35702	11.88015148	0	1012.2	10	1/2/2013 2:00:00 PM	1/2/2013 1:00:00 PM
14	62.21	260	14.96014	17.21582991	0	1012.7	10	1/2/2013 3:00:00 PM	1/2/2013 2:00:00 PM
15	59.65	260	13.80936	15.8915335	0	1012.4	10	1/2/2013 4:00:00 PM	1/2/2013 3:00:00 PM
16	57.06	260	14.96014	17.21582991	0	1011.4	10	1/2/2013 5:00:00 PM	1/2/2013 4:00:00 PM
17	64.93	270	16.11092	18.4012452	0	1011.4	10	1/2/2013 6:00:00 PM	1/2/2013 5:00:00 PM
18	64.93	330	14.96014	17.21582991	0	1011.4	10	1/2/2013 7:00:00 PM	1/2/2013 6:00:00 PM
19	54.68	280	13.80936	15.8915335	0	1010.8	10	1/2/2013 8:00:00 PM	1/2/2013 7:00:00 PM
20	57.04	290	9.20624	10.5945587	0	1011.9	10	1/2/2013 9:00:00 PM	1/2/2013 8:00:00 PM
21	49.62	300	13.80936	15.8915335	0	1012.1	10	1/2/2013 10:00:00 PM	1/2/2013 9:00:00 PM
22	49.83	330	11.5078	13.42494608	0	1013.2	10	1/2/2013 11:00:00 PM	1/2/2013 10:00:00 PM
23	45.43	310	12.65658	14.5073409	0	1014.1	10	1/2/2013 12:00:00 AM	1/2/2013 11:00:00 PM
24	42.84	320	10.35702	11.88015148	0	1014.4	10	1/2/2013 1:00:00 AM	1/2/2013 12:00:00 AM
25	49.19	310	14.96014	17.21582991	0	1015.2	10	1/2/2013 2:00:00 AM	1/2/2013 1:00:00 AM
26	48.48	320	18.41248	21.8871373	0	1016	10	1/2/2013 3:00:00 AM	1/2/2013 2:00:00 AM
27	48.69	320	18.41248	21.8871373	0	1016.5	10	1/2/2013 4:00:00 AM	1/2/2013 3:00:00 AM
28	48.15	310	16.11092	18.4012452	0	1016.4	10	1/2/2013 5:00:00 AM	1/2/2013 4:00:00 AM
29	50.34	310	14.96014	17.21582991	0	1016.3	10	1/2/2013 6:00:00 AM	1/2/2013 5:00:00 AM
30	52.25	330	12.65658	14.5073409	0	1016.3	10	1/2/2013 7:00:00 AM	1/2/2013 6:00:00 AM
31	54.65	330	13.80936	15.8915335	0	1017	10	1/2/2013 8:00:00 AM	1/2/2013 7:00:00 AM
32	51.93	320	14.96014	17.21582991	0	1016.6	10	1/2/2013 9:00:00 AM	1/2/2013 8:00:00 AM
33	~ ~ ~	~ ~ ~	~ ~ ~	~ ~ ~	~	~	~	~	~

Query Settings

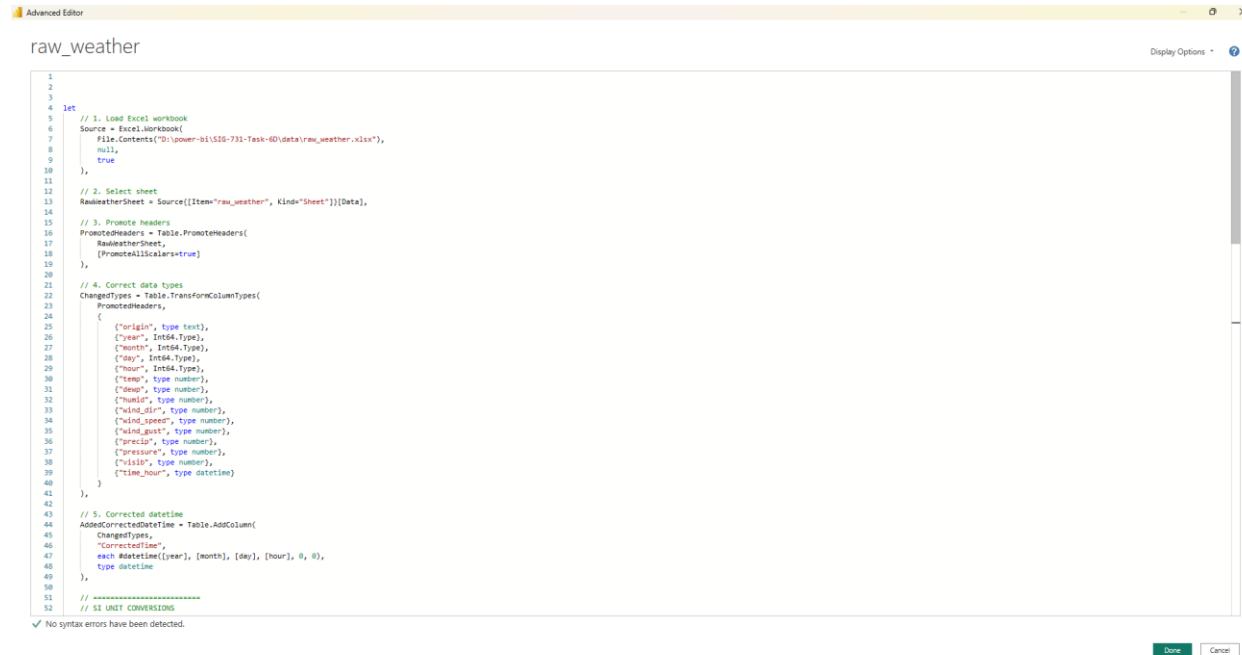
APPLIED STEPS

- Source
- Navigation
- PromotedHeaders
- ChangedTypes
- X AddedCorrectedDateTime

16 COLUMNS, 998+ ROWS Column profiling based on top 1000 rows PREVIEW DOWNLOADED ON SATURDAY

## 05. Unit Conversion

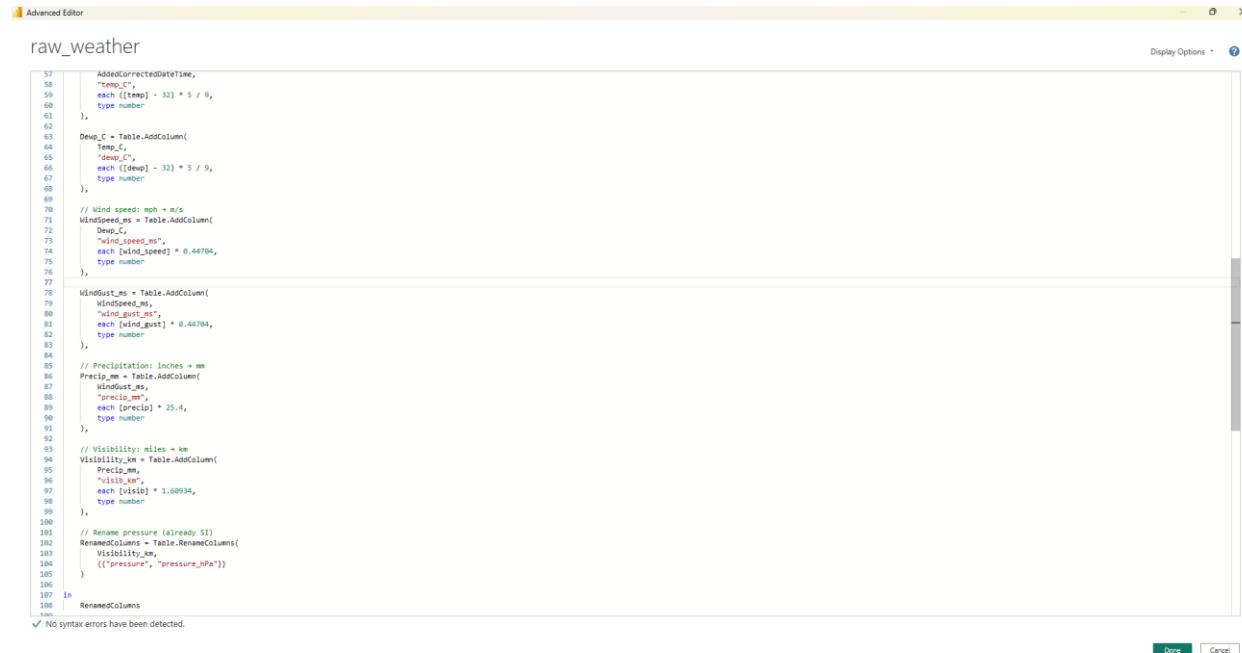
Converting all columns so that they use International System of Units, SI or derived units metrics, by replacing old or by adding new columns.



The screenshot shows the Power BI Advanced Editor window with the title "raw\_weather". The code is written in M language:

```
1
2
3
4 let
5     // 1. Load Excel workbook
6     Source = Excel.Workbook(
7         File.Contents("D:\power-bi\SIG-731-Task-40\data\raw_weather.xlsx"),
8         null,
9         true
10    ),
11
12    // 2. Select sheet
13    RawWeatherSheet = Source[[Item="raw_weather", Kind="Sheet"]][Data],
14
15    // 3. Promote headers
16    PromotedHeaders = Table.PromoteHeaders(
17        RawWeatherSheet,
18        [PromoteAllScalars=true]
19    ),
20
21    // 4. Correct data types
22    ChangedTypes = Table.TransformColumnTypes(
23        PromotedHeaders,
24        {
25            {"origin", type text},
26            {"year", Int64.Type},
27            {"month", Int64.Type},
28            {"day", Int64.Type},
29            {"temp_c", type number},
30            {"temp_f", type number},
31            {"temp", type number},
32            {"temp_min", type number},
33            {"temp_max", type number},
34            {"wind_dir", type number},
35            {"wind_speed", type number},
36            {"wind_gust", type number},
37            {"precip", type number},
38            {"pressure_mb", type number},
39            {"visib", type number},
40            {"time_hour", type datetime}
41        }
42    ),
43
44    // 5. Corrected datetime
45    AddedCorrectedDateTime = Table.AddColumn(
46        ChangedTypes,
47        "CorrectedTime",
48        each #datetime([year], [month], [day], [hour], 0, 0),
49        type datetime
50    ),
51
52 // ***** UNIT CONVERSIONS *****
```

A note at the bottom says: ✓ No syntax errors have been detected.



The screenshot shows the Power BI Advanced Editor window with the title "raw\_weather". The code is written in M language, continuing from the previous snippet:

```
57    AddedCorrectedDateTime,
58    "temp_c",
59    each ((temp) - 32) * 5 / 9,
60    type number
61    ),
62
63    Dewpt_C = Table.AddColumn(
64        Temp_C,
65        "Temp_C",
66        "temp_c",
67        each ((temp) - 32) * 5 / 9,
68        type number
69    ),
69
70    // Wind speed: mph ~ m/s
71    WindSpeed_ms = Table.AddColumn(
72        Temp_C,
73        "wind_speed_ms",
74        "wind_speed",
75        each [wind_speed] * 0.44704,
76        type number
77    ),
77
78    WindGust_ms = Table.AddColumn(
79        Temp_C,
80        "wind_gust_ms",
81        "wind_gust",
82        each [wind_gust] * 0.44704,
83        type number
84    ),
84
85    // Precipitation: inches ~ mm
86    Precip_mm = Table.AddColumn(
87        Temp_C,
88        "precip_mm",
89        "precip",
90        each [precip] * 25.4,
91        type number
92    ),
92
93    // Visibility: miles ~ km
94    Visibility_km = Table.AddColumn(
95        Temp_C,
96        "visib_km",
97        "visib",
98        each [visib] * 1.60934,
99        type number
100    ),
100
101    // Rename pressure (already SI)
102    RenamedColumns = table.RenameColumns(
103        Visibility_km,
104        {"pressure", "pressure_hPa"})
105
106
107 in
108    RenamedColumns
```

A note at the bottom says: ✓ No syntax errors have been detected.

## 06. Daily Mean Wind Speed Calculation

Hourly observations were aggregated to daily means for each airport

Advanced Editor

raw\_weather

```
1
2
3
4 let
5   // 1. Load Excel workbook
6   Source = Excel.Workbook(
7     File.Contents("D:\power-bi\S10-733-Task-4\data\raw_weather.xlsx"),
8     null,
9     true
10    );
11
12  // 2. Select sheet
13  RawWeatherSheet = Source[[Item="raw_weather", Kind="Sheet"]][Data];
14
15  // 3. Promote headers
16  PromotedHeaders = Table.PromoteHeaders(
17    RawWeatherSheet,
18    [PromoteAllScalars=true]
19  );
20
21  // 4. Correct data types
22  ChangedTypes = Table.TransformColumnTypes(
23    PromotedHeaders,
24    [
25      {"origin", type text},
26      {"year", Int64.Type},
27      {"month", Int64.Type},
28      {"day", Int64.Type},
29      {"hour", Int64.Type},
30      {"temp", type number},
31      {"dewp", type number},
32      {"humidity", type number},
33      {"wind_dir", type number},
34      {"wind_spd", type number},
35      {"wind_gust", type number},
36      {"precip", type number},
37      {"pressure", type number},
38      {"visibl", type number},
39      {"time_hour", type datetime}
40    ]
41  );
42
43  // 5. Corrected datetime
44  AddedCorrectedDateTime = Table.AddColumn(
45    ChangedTypes,
46    "CorrectedTime",
47    each #datetime([year], [month], [day], [hour], 0, 0),
48    type datetime
49  );
50
51  // ****SI UNIT CONVERSIONS****
52
53 // No syntax errors have been detected.
```

Display Options

Done Cancel

Advanced Editor

raw\_weather

```
42
43  // 5. Corrected datetime
44  AddedCorrectedDateTime = Table.AddColumn(
45    ChangedTypes,
46    "CorrectedTime",
47    each #datetime([year], [month], [day], [hour], 0, 0),
48    type datetime
49  );
50
51  // ****SI UNIT CONVERSIONS****
52
53 // No syntax errors have been detected.
```

Display Options

Done Cancel

Advanced Editor

raw\_weather

```

92
93    // Visibility: miles = km
94    Visibility_km = Table.AddColumn(
95        Parsed_Weather,
96        "Visibility_km",
97        each [visible] * 1.60934,
98        type number
99    ),
100
101    // Rename pressure (already SI)
102    RenameColumns = Table.RenameColumns(
103        Visibility_km,
104        {"pressure", "pressure_hPa"})
105    },
106
107    // DAILY MEAN WIND SPEED
108    // =====
109
110    // Extract date
111    AddedDate = Table.AddColumn(
112        RenamedColumns,
113        "Date",
114        each Date.From([CorrectedTime]),
115        type date
116    ),
117
118    // Group by airport and date
119    DailyMeanWind = Table.Group(
120        AddedDate,
121        {"origin", "Date"},
122        {
123            "daily_mean_wind_ms",
124            each List.Average([wind_speed_ms]),
125            type number
126        }
127    }
128
129    in
130 | DailyMeanWind
131
132
133
134
135
136

```

No syntax errors have been detected.

Done Cancel

Vine-SIG-731-Task-6D

Home Transform Add Column View Tools Help

Queries [1]

raw\_weather

Table: raw\_weather

Grouped by: AddedDate, {"origin", "Date"}, {

origin Date daily\_mean\_wind\_ms

origin	Date	daily_mean_wind_ms
EWR	1/1/2013	5.703625924
EWR	1/2/2013	5.594586017
EWR	1/3/2013	3.51537057
EWR	1/4/2013	4.84034949
EWR	1/5/2013	4.84435475
EWR	1/6/2013	3.579677843
EWR	1/7/2013	3.965111161
EWR	1/8/2013	2.958656074
EWR	1/9/2013	2.07921396
EWR	1/10/2013	4.52286243
EWR	1/11/2013	2.20821183
EWR	1/12/2013	2.550788261
EWR	1/13/2013	0.90037221
EWR	1/14/2013	2.3578751501
EWR	1/15/2013	4.437085462
EWR	1/16/2013	3.429631275
EWR	1/17/2013	4.179883116
EWR	1/18/2013	5.165882107
EWR	1/19/2013	6.237841881
EWR	1/20/2013	7.030744113
EWR	1/21/2013	3.386760884
EWR	1/22/2013	7.416577631
EWR	1/23/2013	5.873245558
EWR	1/24/2013	5.487410039
EWR	1/25/2013	4.608567025
EWR	1/26/2013	4.329909484
EWR	1/27/2013	4.52286243
EWR	1/28/2013	1.779121224
EWR	1/29/2013	2.400741692
EWR	1/30/2013	2.100849156
EWR	1/31/2013	10.8676441
EWR	2/1/2013	7.759340759
EWR	2/2/2013	5.380234062

3 COLUMNS, 999+ ROWS Column profiling based on top 1000 rows

Query Settings

PROPERTIES

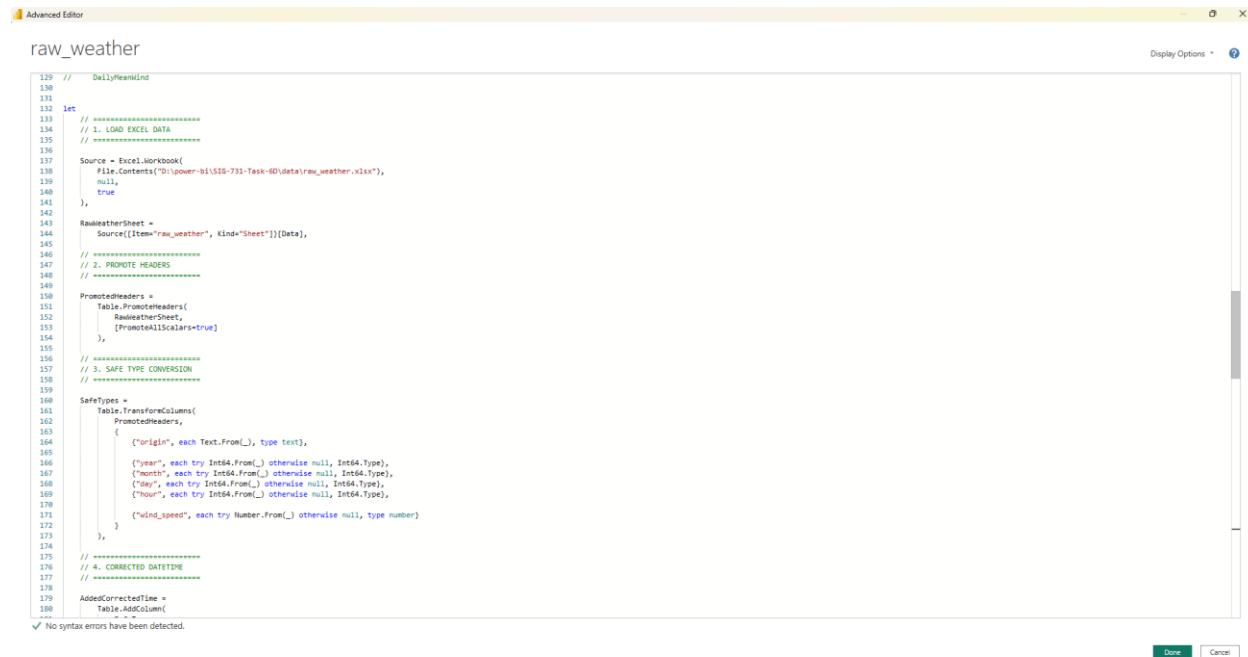
Name: raw\_weather

APPLIED STEPS

- Source
- Navigations
- ProcessInReaders
- ChangeTypes
- AddedCorrectedDateTime
- Temp\_C
- Devp\_C
- WindSpeed\_ms
- WindGust\_ms
- Precip\_mm
- Visibility\_km
- RenamedColumns
- AddedDate
- DailyMeanWind

PREVIEW DOWNLOADED ON SATURDAY

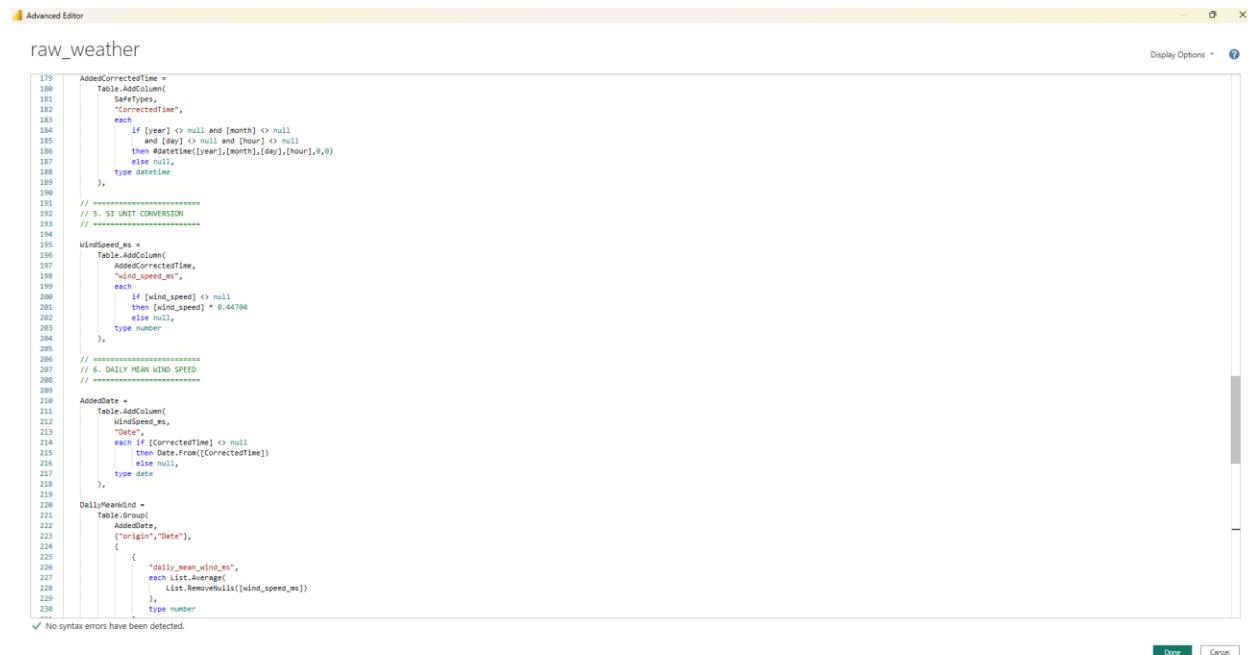
## 07. Outlier Calculations



The screenshot shows the Power BI Advanced Editor interface with the title bar "Advanced Editor" and "Display Options". The main area contains the following DAX code:

```
129 // DailyMeanWind
130
131 let
132     // **** LOAD EXCEL DATA ****
133     // **** LOAD EXCEL DATA ****
134     Source = Excel.Workbook(
135         File.Contents("D:\power-bi\$10-731-Task-40\data\raw_weather.xlsx"),
136         null,
137         true
138     ),
139
140     RawWeatherSheet =
141         Source[Item="raw_weather", Kind="Sheet"]{Data},
142
143     // **** PROMOTE HEADERS ****
144     // 2. PROMOTE HEADERS
145     // **** PROMOTE HEADERS ****
146     PromotedHeaders =
147         Table.PromoteHeaders(
148             RawWeatherSheet,
149             {PromoteAllScalars=true}
150         ),
151
152     // **** SAFE TYPES ****
153     // 3. SAFE TYPE CONVERSION
154     // **** SAFE TYPES ****
155     SafeTypes =
156         Table.TransformColumns(
157             PromotedHeaders,
158             {
159                 {"origin", each Text.From(_), type text},
160                 {"year", each try Int64.From(_) otherwise null, Int64.Type},
161                 {"month", each try Int64.From(_) otherwise null, Int64.Type},
162                 {"day", each try Int64.From(_) otherwise null, Int64.Type},
163                 {"hour", each try Int64.From(_) otherwise null, Int64.Type},
164                 {"wind_speed", each try Number.From(_) otherwise null, type number}
165             }
166         ),
167
168     // **** CORRECTED DATE/TIME ****
169     // 4. CORRECTED DATE/TIME
170     // **** CORRECTED DATE/TIME ****
171     AddedCorrectedTime =
172         Table.AddColumn(
173             SafeTypes,
174             "AddedCorrectedTime",
175             each
176                 if [year] < null and [month] < null
177                     and [day] < null and [hour] < null
178                     then DateTimeSet([year],[month],[day],[hour],0,0)
179                 else
180                     type datetime
181             ),
182
183     // **** SI UNIT CONVERSION ****
184     // 5. SI UNIT CONVERSION
185     // **** SI UNIT CONVERSION ****
186     WindSpeed_ms =
187         Table.AddColumn(
188             AddedCorrectedTime,
189             "AddedCorrectedTime",
190             "wind_speed_ms",
191             each
192                 if [wind_speed] < null
193                     then [wind_speed] * 0.44704
194                 else null,
195                 type number
196             ),
197
198     // **** DAILY MEAN WIND SPEED ****
199     // **** DAILY MEAN WIND SPEED ****
200     DailyMeanWind =
201         Table.AddColumn(
202             WindSpeed_ms,
203             "Date",
204             each
205                 if [AddedCorrectedTime] < null
206                     then Data.From([AddedCorrectedTime])
207                     else null,
208                 type date
209             ),
210
211     DailyMeanWind =
212         Table.AddColumn(
213             DailyMeanWind,
214             "AddedDate",
215             "Date",
216             each
217                 if [Date] < null
218                     then Data.From([Date])
219                     else null,
220                 type date
221             ),
222
223     DailyMeanWind =
224         Table.AddColumn(
225             DailyMeanWind,
226             "origin", "Date",
227             {
228                 {"daily_mean_wind_ms",
229                  each List.Average(
230                      List.RemoveNulls([wind_speed_ms])
231                  ), type number}
232             }
233         ),
234
235     DailyMeanWind
236 
```

At the bottom left, a green checkmark indicates "No syntax errors have been detected." At the bottom right, there are "Done" and "Cancel" buttons.



The screenshot shows the Power BI Advanced Editor interface with the title bar "Advanced Editor" and "Display Options". The main area contains the following DAX code:

```
179 AddCorrectedTime =
180     Table.AddColumn(
181         SafeTypes,
182         "CorrectedTime",
183         each
184             if [year] < null and [month] < null
185                 and [day] < null and [hour] < null
186                 then DateTimeSet([year],[month],[day],[hour],0,0)
187             else
188                 type datetime
189         ),
190
191 // 5. SI UNIT CONVERSION
192 // **** SI UNIT CONVERSION ****
193 WindSpeed_ms =
194     Table.AddColumn(
195         AddCorrectedTime,
196         "AddedCorrectedTime",
197         "wind_speed_ms",
198         each
199             if [wind_speed] < null
200                 then [wind_speed] * 0.44704
201             else null,
202             type number
203         ),
204
205 // **** DAILY MEAN WIND SPEED ****
206 // **** DAILY MEAN WIND SPEED ****
207 DailyMeanWind =
208     Table.AddColumn(
209         WindSpeed_ms,
210         "Date",
211         "Date",
212         each
213             if [AddedCorrectedTime] < null
214                 then Data.From([AddedCorrectedTime])
215                 else null,
216                 type date
217             ),
218
219 DailyMeanWind =
220     Table.AddColumn(
221         DailyMeanWind,
222         "AddedDate",
223         "Date",
224         each
225             if [Date] < null
226                 then Data.From([Date])
227                 else null,
228                 type date
229             ),
230
231 DailyMeanWind =
232     Table.AddColumn(
233         DailyMeanWind,
234         "origin", "Date",
235         {
236             {"daily_mean_wind_ms",
237              each List.Average(
238                  List.RemoveNulls([wind_speed_ms])
239              ), type number}
240         }
241     ),
242
243 DailyMeanWind
244 
```

At the bottom left, a green checkmark indicates "No syntax errors have been detected." At the bottom right, there are "Done" and "Cancel" buttons.

Advanced Editor

raw\_weather

```

217     type date
218 ),
219 DailyMeanWind =
220     Table.Group(
221         AddDate,
222         {"origin", "Date"},
223         {
224             "daily_mean_wind_ms",
225             each List.Average(
226                 List.RemoveNulls([wind_speed_ms])
227             ),
228             type number
229         }
230     ),
231 ),
232 ),
233 ),
234
235 // *****
236 // ? - IQR CALCULATION
237 // *****
238
239 NonNullValues =
240     List.RemoveNulls(DailyMeanWind(daily_mean_wind_ms)),
241
242 Q1 = List.Percentile(NonNullValues, 0.25),
243 Q3 = List.Percentile(NonNullValues, 0.75),
244 IQR = Q3 - Q1,
245
246 LowerBound = Q1 - 1.5 * IQR,
247 UpperBound = Q3 + 1.5 * IQR,
248
249 // *****
250 // ? - OUTLIER FLAGGING
251 // *****
252
253 OutlierFlagged =
254     Table.AddColumn(
255         DailyMeanWind,
256         "OutlierFlag",
257         each
258             if [daily_mean_wind_ms] = null then "Missing"
259             else if [daily_mean_wind_ms] < LowerBound
260                 or [daily_mean_wind_ms] > UpperBound
261                 then "Outlier"
262                 else "Normal",
263             type text
264     )
265
266 in
267     OutlierFlagged
268 
```

✓ No syntax errors have been detected.

Done Cancel

Vine-SIG-731-Task-6

Home Transform Add Column View Tools Help

Queries [1]

raw\_weather

	origin	Date	1.2_daily_mean_wind_ms	OutlierFlag
1	EWR	1/1/2013	5.703252924	Normal
2	EWR	1/2/2013	5.594580017	Normal
3	EWR	1/3/2013	3.515372057	Normal
4	EWR	1/4/2013	6.19477149	Normal
5	EWR	1/5/2013	4.84455475	Normal
6	EWR	1/6/2013	3.576577645	Normal
7	EWR	1/7/2013	3.965311161	Normal
8	EWR	1/8/2013	2.958056974	Normal
9	EWR	1/9/2013	2.079211996	Normal
10	EWR	1/10/2013	4.522826243	Normal
11	EWR	1/11/2013	2.207825133	Normal
12	EWR	1/12/2013	2.550788203	Normal
13	EWR	1/13/2013	0.90027821	Normal
14	EWR	1/14/2013	2.357871501	Normal
15	EWR	1/15/2013	4.437085462	Normal
16	EWR	1/16/2013	3.429831275	Normal
17	EWR	1/17/2013	4.179883126	Normal
18	EWR	1/18/2013	5.165882107	Normal
19	EWR	1/19/2013	6.273941483	Normal
20	EWR	1/20/2013	7.000794113	Normal
21	EWR	1/21/2013	3.580094844	Normal
22	EWR	1/22/2013	7.415370381	Normal
23	EWR	1/23/2013	5.872424559	Normal
24	EWR	1/24/2013	5.487410039	Normal
25	EWR	1/25/2013	4.600567025	Normal
26	EWR	1/26/2013	4.320900484	Normal
27	EWR	1/27/2013	4.522826243	Normal
28	EWR	1/28/2013	1.779312124	Normal
29	EWR	1/29/2013	2.400741482	Normal
30	EWR	1/30/2013	2.100649156	Normal
31	EWR	1/31/2013	10.8676441	Outlier
32	EWR	2/1/2013	7.759540759	Normal
33	EWR	2/2/2013	5.380234062	Normal
34	EWR	2/3/2013	2.636529042	Normal
35	EWR	2/4/2013	6.250770706	Normal
36	EWR	2/5/2013	2.225260329	Normal
37	EWR	2/6/2013	3.794029598	Normal

4 COLUMNS, 999+ ROWS Column profiling based on top 1000 rows

Query Settings

PROPERTIES

Name: raw\_weather

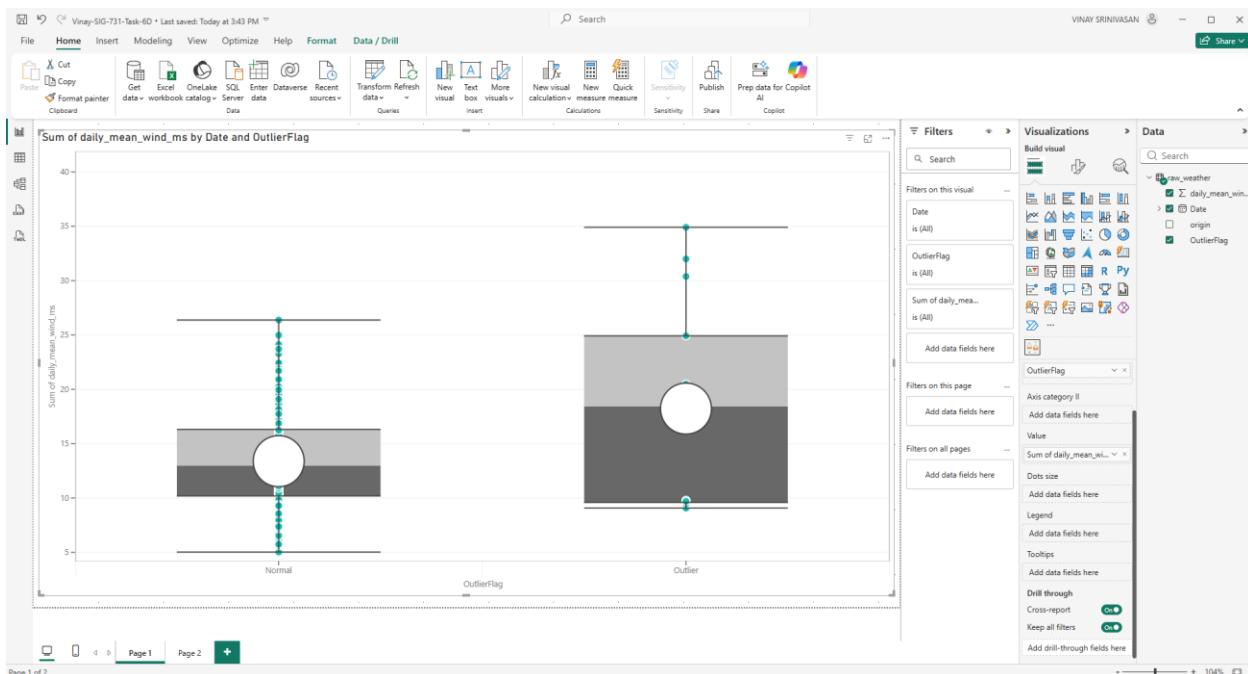
All Properties

APPLIED STEPS

Source: Navigation  
Properties Headers: None  
Safe Types: None  
Added Corrected Time: None  
WindSpeed\_ms: None  
Added Date: None  
DailyMeanWind: None  
NonNullValues: None  
Q1: None  
Q3: None  
IQR: None  
Lower Bound: None  
Upper Bound: None

OutlierFlagged

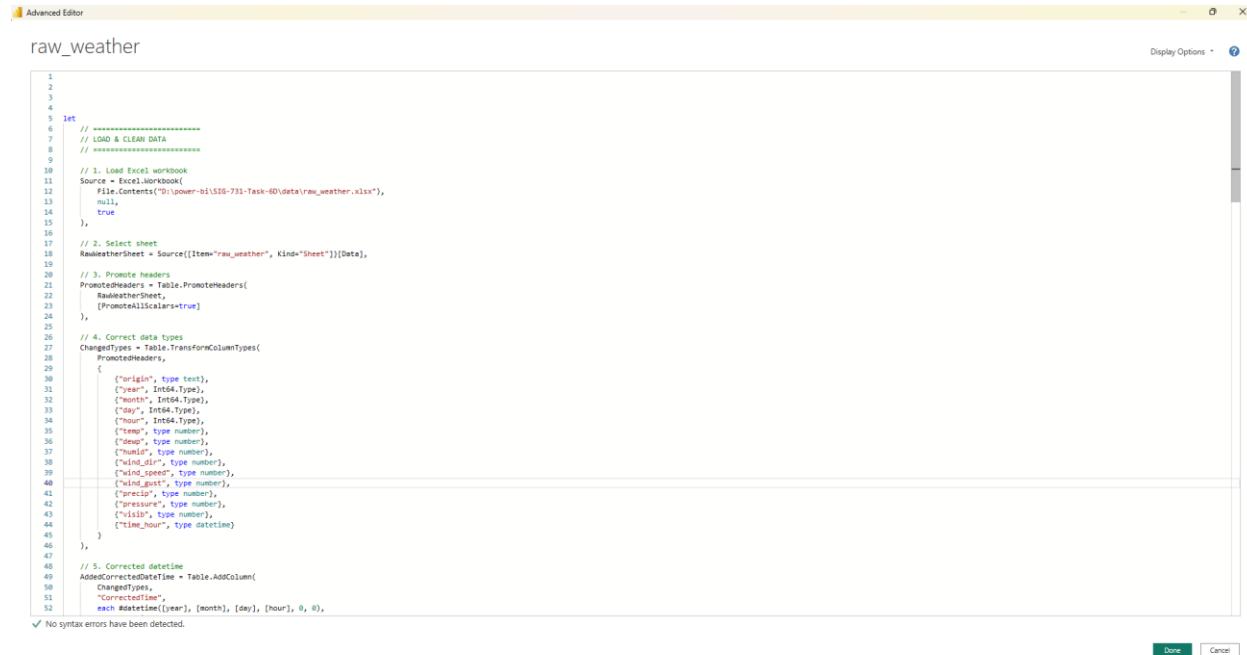
PREVIEW DOWNLOADED AT 3:19 PM



outliers in this analysis represent statistically extreme daily wind speeds identified using the IQR method. Their identification and visualization enhance the robustness and credibility of the analysis, ensuring that reported monthly wind speed trends are both accurate and representative.

Outliers were identified using the Interquartile Range method and represent daily mean wind speeds that deviate substantially from typical conditions. These values were visualized and subsequently excluded from monthly averages to prevent extreme events from biasing seasonal wind speed estimates

## 07. Calculating Monthly Mean Wind

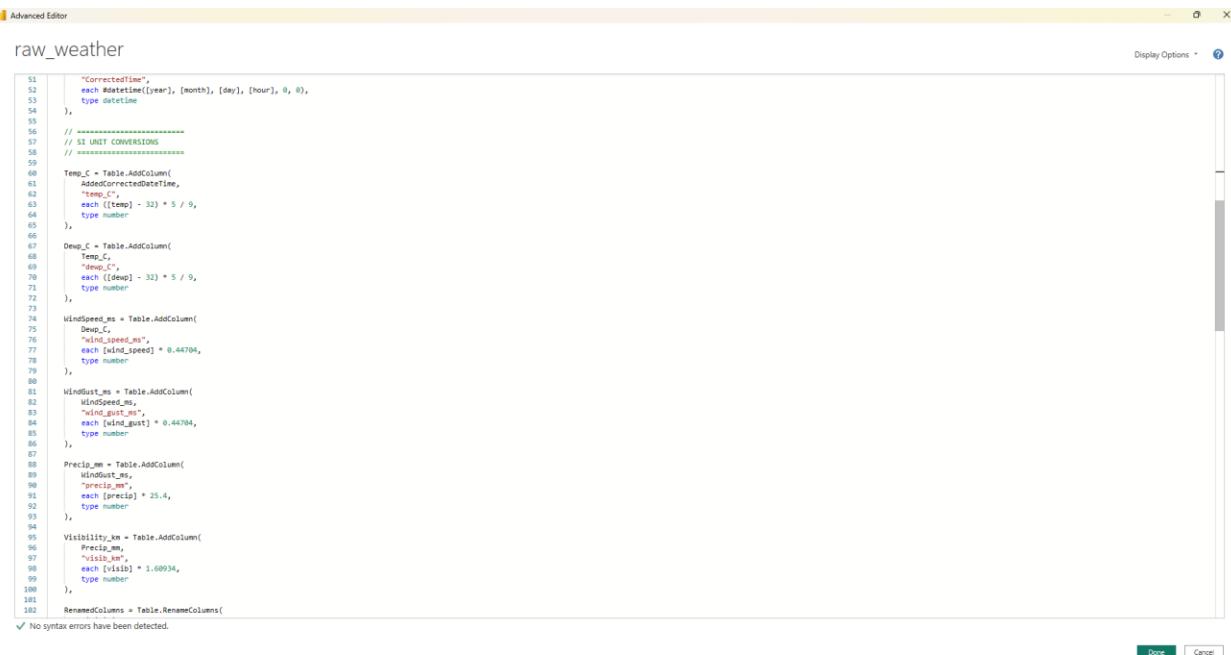


The screenshot shows the Power BI Advanced Editor window with the title "raw\_weather". The code is written in DAX and performs the following steps:

- Loads an Excel workbook from "D:\power-bi\510-731-Task-0\data\raw\_weather.xlsx".
- Selects the "raw\_weather" sheet.
- Promotes headers for the table.
- Changes data types for columns: year (Int64), month (Int64), day (Int64), hour (Int64), temp (Number), dew (Number), wind\_dir (Number), wind\_speed (Number), wind\_gust (Number), pressure (Number), visibility (Number), and time\_hour (DateTime).
- Adds a "CorrectedTime" column with the formula `#datetime([year], [month], [day], [hour], 0, 0)`.

The status bar at the bottom indicates "No syntax errors have been detected." and includes "Done" and "Cancel" buttons.

```
1
2
3
4
5 let
6     // **** LOAD & CLEAR DATA ****
7     // **** LOAD & CLEAR DATA ****
8
9     // 1. Load Excel workbook
10    Source = Excel.Workbook(
11        File.Contents("D:\power-bi\510-731-Task-0\data\raw_weather.xlsx"),
12        null,
13        true
14    ),
15
16    // 2. Select sheet
17    RawWeatherSheet = Source[[Item="raw_weather", Kind="Sheet"]][Data],
18
19    // 3. Promote Headers
20    PromotedHeaders = Table.PromoteHeaders(
21        RawWeatherSheet,
22        [PromoteAllScalars=true]
23    ),
24
25
26    // 4. Correct data types
27    ChangedTypes = Table.TransformColumnTypes(
28        PromotedHeaders,
29        {
30            {"origin", type text},
31            {"year", Int64.Type},
32            {"month", Int64.Type},
33            {"day", Int64.Type},
34            {"hour", Int64.Type},
35            {"temp", type number},
36            {"dew", type number},
37            {"wind_dir", type number},
38            {"wind_speed", type number},
39            {"wind_gust", type number},
40            {"pressure", type number},
41            {"visibility", type number},
42            {"time_hour", type datetime}
43        }
44    ),
45
46    // 5. Corrected datetime
47    AddedCorrectedDateTime = Table.AddColumn(
48        ChangedTypes,
49        "CorrectedTime",
50        "CorrectedTime",
51        each #datetime([year], [month], [day], [hour], 0, 0),
52    )
53
54
55
56
57
58
59
59
60 Temp_C = Table.AddColumn(
61    AddedCorrectedDateTime,
62    "temp_C",
63    "temp_C",
64    each ([temp] - 32) * 5 / 9,
65    type number
66 ),
67
68 Dev_C = Table.AddColumn(
69    Temp_C,
70    "dev_C",
71    "dev_C",
72    each ([temp] - 32) * 5 / 9,
73    type number
74 ),
75 WindSpeed_ms = Table.AddColumn(
76    Dev_C,
77    "wind_speed_ms",
78    "wind_speed_ms",
79    each [wind_speed] * 0.44704,
80    type number
81 ),
82 WindGust_ms = Table.AddColumn(
83    WindSpeed_ms,
84    "wind_gust_ms",
85    "wind_gust_ms",
86    each [wind_gust] * 0.44704,
87    type number
88 ),
89 Precip_mm = Table.AddColumn(
90    WindGust_ms,
91    "precip_mm",
92    "precip_mm",
93    each [precip] * 25.4,
94    type number
95 ),
96 Visibility_km = Table.AddColumn(
97    Precip_mm,
98    "visibility_km",
99    "visibility_km",
100    each [visibility] * 1.60934,
101    type number
102 ),
103 RenamedColumns = Table.RenameColumns(
```



The screenshot shows the Power BI Advanced Editor window with the title "raw\_weather". The code is identical to the previous version but includes additional unit conversion logic for temperature, wind speed, and visibility.

The status bar at the bottom indicates "No syntax errors have been detected." and includes "Done" and "Cancel" buttons.

```
51    "CorrectedTime",
52    each #datetime([year], [month], [day], [hour], 0, 0),
53    type datetime
54 ),
55
56
57
58
59
59
60 Temp_C = Table.AddColumn(
61    AddedCorrectedDateTime,
62    "temp_C",
63    "temp_C",
64    each ([temp] - 32) * 5 / 9,
65    type number
66 ),
67
68 Dev_C = Table.AddColumn(
69    Temp_C,
70    "dev_C",
71    "dev_C",
72    each ([temp] - 32) * 5 / 9,
73    type number
74 ),
75 WindSpeed_ms = Table.AddColumn(
76    Dev_C,
77    "wind_speed_ms",
78    "wind_speed_ms",
79    each [wind_speed] * 0.44704,
80    type number
81 ),
82 WindGust_ms = Table.AddColumn(
83    WindSpeed_ms,
84    "wind_gust_ms",
85    "wind_gust_ms",
86    each [wind_gust] * 0.44704,
87    type number
88 ),
89 Precip_mm = Table.AddColumn(
90    WindGust_ms,
91    "precip_mm",
92    "precip_mm",
93    each [precip] * 25.4,
94    type number
95 ),
96 Visibility_km = Table.AddColumn(
97    Precip_mm,
98    "visibility_km",
99    "visibility_km",
100    each [visibility] * 1.60934,
101    type number
102 ),
103 RenamedColumns = Table.RenameColumns(
```

Advanced Editor

raw\_weather

```

163     "type number"
164   ),
165   Precip_mm = Table.AddColumn(
166     WindGust_ms,
167     "precip_mm",
168     each [precip] * 25.4,
169     type number
170   ),
171   Visibility_km = Table.AddColumn(
172     Precip_mm,
173     "visib_km",
174     each [visib] * 1.68934,
175     type number
176   ),
177   RenamedColumns = Table.RenameColumns(
178     Visibility_km,
179     {"("pressure", "pressure_hPa")"}
180   ),
181   // ****MEAN WIND SPEED
182   // ****
183   AddedDate = Table.AddColumn(
184     RenamedColumns,
185     "date",
186     each Date.From([CorrectedTime]),
187     type date
188   ),
189   DailyMeanWind = Table.Group(
190     AddedDate,
191     {"origin", "Date"},
192     {
193       {
194         "daily_mean_wind_ms",
195         each List.Average([wind_speed_ms]),
196         type number
197       }
198     },
199   ),
200   // ****MONTHLY MEAN WIND SPEED
201   // ****
202   AddedYear = Table.AddColumn(
203     DailyMeanWind,
204     "Year",
205     each Date.Year([Date]),
206     type Int64
207   ),
208
209 
```

✓ No syntax errors have been detected.

Done Cancel

Advanced Editor

raw\_weather

```

141     "date",
142     each Date.From([CorrectedTime]),
143     type date
144   ),
145   DailyMeanWind = Table.Group(
146     AddedDate,
147     {"origin", "Date"},
148     {
149       {
150         "daily_mean_wind_ms",
151         each List.Average([wind_speed_ms]),
152         type number
153       }
154     },
155   ),
156   // ****MONTHLY MEAN WIND SPEED
157   // ****
158   AddedYear = Table.AddColumn(
159     DailyMeanWind,
160     "Year",
161     each Date.Year([Date]),
162     Int64.Type
163   ),
164   AddedMonth = Table.AddColumn(
165     AddedYear,
166     "Month",
167     each Date.Month([Date]),
168     Int64.Type
169   ),
170   MonthlyMeanWind = Table.Group(
171     AddedMonth,
172     {"origin", "Year", "Month"},
173     {
174       {
175         "monthly_mean_wind_ms",
176         each List.Average([daily_mean_wind_ms]),
177         type number
178       }
179     }
180   )
181 in
182 MonthlyMeanWind
183
184
185
186
187 
```

✓ No syntax errors have been detected.

Done Cancel

Vinay-SIG-731-Task-60

Queries [1] Table.Group[raw\_weather]

Properties Advanced Editor Refresh Preview Manage Query Choose Columns Remove Rows Sort Split Column Group By Replace Values Transform Merge Queries Append Queries Combine Files

Transform Use First Row as Headers Data Type: Text Column Group Remove Reduce Rows Manage Columns Sort Split Column Group By Replace Values Transform Combine

Query Settings

**APPLIED STEPS**

- Source
- Navigation
- PromotedHeaders
- ChangeTypes
- AddedCorrectedDateTime
- Temp\_C
- Drops\_C
- WindSpeed\_ms
- WindGust\_ms
- Precip\_mm
- Visibility\_km
- RenamedColumns
- AddedDate
- DailyMeanWind
- AddedYear
- AddedMonth
- MonthlyMeanWind

## 08. Correcting Errors

Advanced Editor

raw\_weather

```

1
2
3 let
4 // *****
5 // LOAD DATA
6 // *****
7
8 Source = Excel.Workbook(
9   File.Contents("D:\power-bi\SIG-731-Task-60\data\raw_weather.xlsx"),
10  null,
11  true
12 ),
13
14 RawWeatherSheet = Source[[Item="raw_weather", Kind="Sheet"]][Data],
15
16 PromotedHeaders = Table.PromoteHeaders(
17   RawWeatherSheet,
18   [PromoteAllScalars=true]
19 ),
20
21 // *****
22 // SAFE TYPE CONVERSION
23 // *****
24
25 SafeTypes = Table.TransformColumns(
26   PromotedHeaders,
27   {
28     {"origin", each Text.From(_), type text},
29
30     {"Year", each try Int64.From(.) otherwise null, Int64.Type},
31     {"Month", each try Int64.From(.) otherwise null, Int64.Type},
32     {"Day", each try Int64.From(.) otherwise null, Int64.Type},
33     {"Hour", each try Int64.From(.) otherwise null, Int64.Type},
34
35     {"temp", each try Number.From(.) otherwise null, type number},
36     {"dewp", each try Number.From(.) otherwise null, type number},
37     {"humidity", each try Number.From(.) otherwise null, type number},
38     {"wind_dir", each try Number.From(.) otherwise null, type number},
39     {"wind_spd", each try Number.From(.) otherwise null, type number},
40     {"wind_gust", each try Number.From(.) otherwise null, type number},
41     {"precip", each try Number.From(.) otherwise null, type number},
42     {"pressure", each try Number.From(.) otherwise null, type number},
43     {"visibl", each try Number.From(.) otherwise null, type number},
44
45     {"time_hour", each try DateTime.From(.) otherwise null, type datetime}
46   }
47 ),
48
49 // *****
50 // CORRECTED DATETIME
51 // *****
52

```

✓ No syntax errors have been detected.

Display Options

Done Cancel

Advanced Editor

### raw\_weather

```

48 // ****
49 // CORRECTED DATETIME
50 // ****
51
52 AddedCorrectedTime = Table.AddColumn(
53     Source,
54     "correctedTime",
55     each
56         if [year] <> null and [month] <> null and [day] <> null and [hour] <> null
57             then datetime([year], [month], [day], [hour], 0, 0)
58         else null
59     type datetime
60 ),
61
62 // ****
63 // SI UNIT CONVERSION
64 // ****
65
66 WindSpeed_ms = Table.AddColumn(
67     Source,
68     "AddedCorrectedTime",
69     "wind_speed_ms",
70     each if [wind_speed] <> null then [wind_speed] * 0.44704 else null,
71     type number
72 ),
73
74 // ****
75 // DAILY MEAN WIND SPEED
76 // ****
77
78 AddedDate = Table.AddColumn(
79     WindSpeed_ms,
80     "Date",
81     each if [correctedTime] <> null then Date.From([correctedTime]) else null,
82     type date
83 ),
84
85 DailyMeanWindNew = Table.Group(
86     AddedDate,
87     {"origin", "Date"},
88     {
89         daily_mean_wind_ms,
90         each List.Average(List.RemoveNulls([wind_speed_ms])),
91     }
92     type number
93 )
94
95
96 in
97 DailyMeanWindNew
98

```

No syntax errors have been detected.

Done Cancel

Vine-SIG-731-Task-6

Home Transform Add Column View Tools Help

Queries [1] raw\_weather

	origin	Date	12_daly_mean_wind_ms
1	EWR	1/1/2013	5.703252924
2	EWR	1/2/2013	5.594580017
3	EWR	1/3/2013	3.515372057
4	EWR	1/4/2013	6.19477149
5	EWR	1/5/2013	4.844554175
6	EWR	1/6/2013	3.576577645
7	EWR	1/7/2013	3.965511161
8	EWR	1/8/2013	2.958059874
9	EWR	1/9/2013	2.07921196
10	EWR	1/10/2013	4.522826243
11	EWR	1/11/2013	2.207825133
12	EWR	1/12/2013	2.550788261
13	EWR	1/13/2013	0.90027421
14	EWR	1/14/2013	2.357871501
15	EWR	1/15/2013	4.437085462
16	EWR	1/16/2013	3.429831275
17	EWR	1/17/2013	4.179883116
18	EWR	1/18/2013	5.165882107
19	EWR	1/19/2013	6.237941481
20	EWR	1/20/2013	7.000794113
21	EWR	1/21/2013	3.580094884
22	EWR	1/22/2013	7.415370781
23	EWR	1/23/2013	5.432245159
24	EWR	1/24/2013	5.487410039
25	EWR	1/25/2013	4.600567025
26	EWR	1/26/2013	4.320900484
27	EWR	1/27/2013	4.523263243
28	EWR	1/28/2013	1.779131224
29	EWR	1/29/2013	2.400741482
30	EWR	1/30/2013	2.100649156
31	EWR	1/31/2013	10.8676441
32	EWR	2/1/2013	7.759540759
33	EWR	2/2/2013	5.380234062
34	EWR	2/3/2013	2.636520204
35	EWR	2/4/2013	6.250770706
36	EWR	2/5/2013	2.225260329
37	EWR	2/6/2013	3.794029598

3 COLUMNS, 999+ ROWS Column profiling based on top 1000 rows

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## 09. Removing Outliers and preparing final required data

Advanced Editor

raw\_weather

```

1
2
3
4 let
5 // *****
6 // LOAD EXCEL DATA
7 // *****
8
9 Source = Excel.Workbook(
10   file.Contents("D:\power-bi\SSIS-731-Task-01\data\raw_weather.xlsx"),
11   null,
12   true
13 ),
14
15 RawWeatherSheet = Source[[Item="raw_weather", Kind="Sheet"]][Data],
16
17 PromotedHeaders = Table.PromoteHeaders(
18   RawWeatherSheet,
19   [PromoteAllScalars=true]
20 ),
21
22 // *****
23 // SAFE TYPE CONVERSION
24 // *****
25 SafeTypes = Table.TransformColumns(
26   PromotedHeaders,
27   {
28     ("origin", each Text.From(_), type text),
29     ("year", each try Int64.From(_) otherwise null, Int64.Type),
30     ("month", each try Int64.From(_) otherwise null, Int64.Type),
31     ("day", each try Int64.From(_) otherwise null, Int64.Type),
32     ("hour", each try Int64.From(_) otherwise null, Int64.Type),
33     ("wind_speed", each try Number.From(_) otherwise null, type number)
34   }
35 ),
36
37 // *****
38 // CORRECTED DATETIME
39 // *****
40
41 AddedCorrectedTime = Table.AddColumn(
42   SafeTypes,
43   "CorrectedTime",
44   each
45     if [year] <> null and [month] <> null and [day] <> null and [hour] <> null
46     then #datetime([year], [month], [day], [hour], 0, 0)
47     else null,
48     type datetime
49 ),
50
51 // *****
52 
```

✓ No syntax errors have been detected.

Done Cancel

Advanced Editor

raw\_weather

```

51   type datetime
52   ),
53
54 // *****
55 // SI UNIT CONVERSION
56 // *****
57
58 WindSpeed_ms = Table.AddColumn(
59   AddedCorrectedTime,
60   "wind_speed_ms",
61   each if [wind_speed] <> null then [wind_speed] * 0.44704 else null,
62   type number
63 ),
64
65 // *****
66 // DAILY MEAN WIND SPEED
67 // *****
68
69 AddedDate = Table.AddColumn(
70   WindSpeed_ms,
71   "date",
72   each if [CorrectedTime] <> null then Date.From([CorrectedTime]) else null,
73   type date
74 ),
75
76 DailyMeanWind = Table.Group(
77   AddedDate,
78   {"origin", "date"},
79   {
80     {
81       "daily_mean_wind_ms",
82       each List.Average(List.RemoveNulls([wind_speed_ms])),
83       type number
84     }
85   }
86 ),
87
88 // *****
89 // IQR OUTLIER REMOVAL (SAFE)
90 // *****
91
92 NonNullValues =
93   List.RemoveNulls(DailyMeanWind[daily_mean_wind_ms]),
94
95 Q1 = List.Percentile(NonNullValues, 0.25),
96 Q3 = List.Percentile(NonNullValues, 0.75),
97 IQR = Q3 - Q1,
98
99 LowerBound = Q1 - 1.5 * IQR,
100 UpperBound = Q3 + 1.5 * IQR,
101
102 DailyNoOutliers = Table.SelectRows(
103   
```

✓ No syntax errors have been detected.

Done Cancel

Advanced Editor

raw\_weather

```

95     Q1 = List.Percentile(NonNullValues, 0.25),
96     Q3 = List.Percentile(NonNullValues, 0.75),
97     IQR = Q3 - Q1,
98
99     LowerBound = Q1 - 1.5 * IQR,
100    UpperBound = Q3 + 1.5 * IQR,
101
102    DailyNoOutliers = Table.SelectRows(
103        DailyMeanWind,
104        each
105            [daily_mean_wind_ms] < null end
106            [daily_mean_wind_ms] >= LowerBound and
107            [daily_mean_wind_ms] <= UpperBound
108        ),
109
110    // ****MONTHLY MEAN (NO OUTLIERS)
111    // ****MONTHLY MEAN (NO OUTLIERS)
112
113    AddYear = Table.AddColumn(
114        DailyNoOutliers,
115        "Year",
116        each Date.Year([Date]),
117        Int64.Type
118    ),
119
120    AddMonth = Table.AddColumn(
121        AddYear,
122        "Month",
123        each Date.Month([Date]),
124        Int64.Type
125    ),
126
127    MonthlyMeanWind = Table.Group(
128        AddMonth,
129        {"origin", "Year", "Month"},
130        {
131            {
132                "monthly_mean_wind_ms",
133                each List.Average(List.RemoveNulls((daily_mean_wind_ms))),
134            }
135        }
136    )
137
138
139
140    in
141    MonthlyMeanWind
142
143

```

No syntax errors have been detected.

Done Cancel

Vine-SIG-731-Task-6D

Home Transform Add Column View Tools Help

Queries [1] raw\_weather

origin	Year	Month	monthly_mean_wind_ms
EWR	2013	1	4.11047128
EWR	2013	2	4.539458235
EWR	2013	3	4.986168186
EWR	2013	4	4.265603898
EWR	2013	5	3.709671792
EWR	2013	6	4.20272724
EWR	2013	7	4.019983287
EWR	2013	8	3.351015516
EWR	2013	9	3.717400611
EWR	2013	10	3.658593796
EWR	2013	11	4.443668002
EWR	2013	12	3.919829077
JFK	2013	1	5.116880747
JFK	2013	2	4.940812555
JFK	2013	3	5.9424982
JFK	2013	4	5.587213778
JFK	2013	5	4.280388791
JFK	2013	6	4.88438654
JFK	2013	7	4.301090414
JFK	2013	8	4.002778643
JFK	2013	9	4.259025158
JFK	2013	10	4.428251614
JFK	2013	11	5.419179303
JFK	2013	12	4.801502192
USA	2013	1	4.88237527
USA	2013	2	5.051748076
USA	2013	3	5.737052403
USA	2013	4	4.03152197
USA	2013	5	4.37944022
USA	2013	6	4.462807096
USA	2013	7	4.180277556
USA	2013	8	3.711850307
USA	2013	9	3.940727875
USA	2013	10	4.574988679
USA	2013	11	5.221527538
USA	2013	12	4.526598776

4 COLUMNS, 36 ROWS Column profiling based on top 1000 rows

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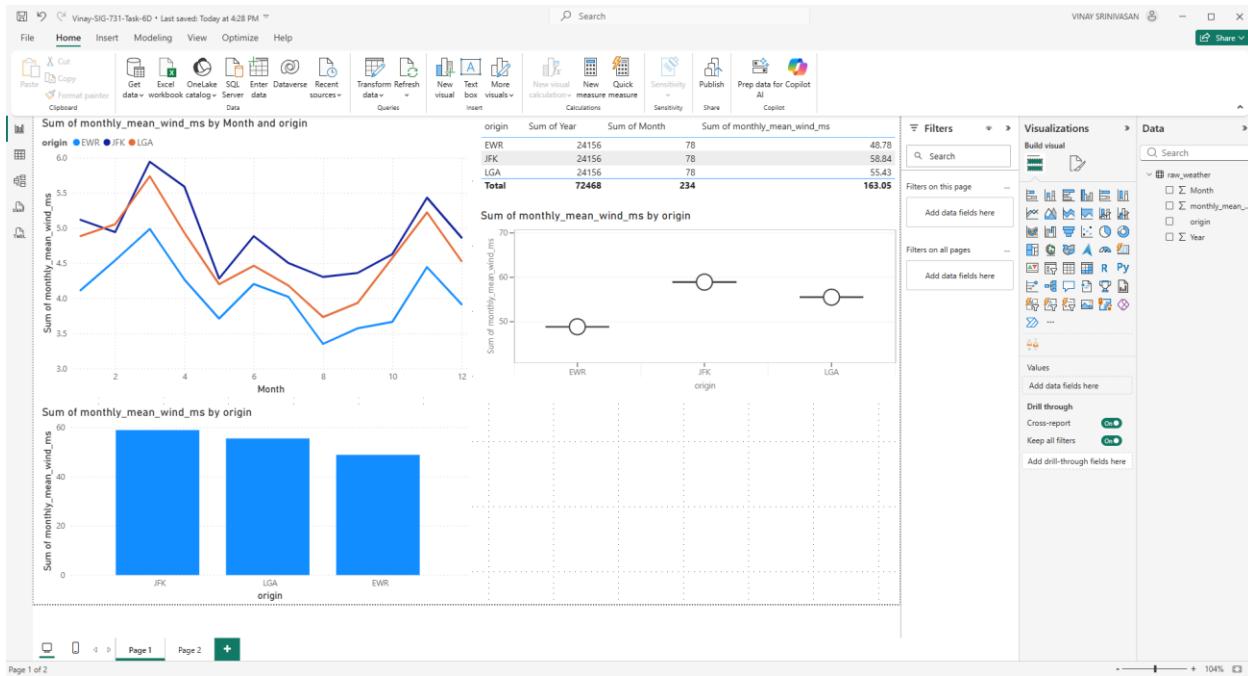
Properties

- Name: raw\_weather
- All Properties

Applied Steps

- Source
- Navigation
- PropertiesHeaders
- SafeTypes
- AddedCorrectedTime
- WindSpeed\_ms
- AddedDate
- DailyMeanWind
- NonNullValues
- Q1
- Q3
- IQR
- LowerBound
- UpperBound
- DailyNoOutliers
- AddedYear
- AddedMonth
- MonthlyMeanWind

## 10. Final Dashboard



<https://app.powerbi.com/groups/me/reports/f2a65ac2-daf8-4fec-a3e3-fcd4ca5311fe/c0f693e5777160b349ed?experience=power-bi>

All meteorological variables were converted to International System of Units (SI) or SI-derived units using Power Query. Original measurements were preserved, and new columns were created for temperature ( $^{\circ}\text{C}$ ), wind speed (m/s), precipitation (mm), visibility (km), pressure (hPa), and relative humidity (fraction). This approach ensures scientific consistency and reproducibility

### 10.a Line Chart

The line chart shows a strong seasonal cycle in monthly mean wind speed, with higher values during winter and lower values in summer. EWR generally experiences the strongest winds, while LGA records the weakest, although all airports follow similar temporal trends

### 10.b Column Chart

The column chart shows that EWR has the highest average wind speed, followed by JFK, while LGA consistently records the lowest. This highlights persistent inter-airport differences in wind exposure despite similar seasonal patterns

## 10.c Table Chart

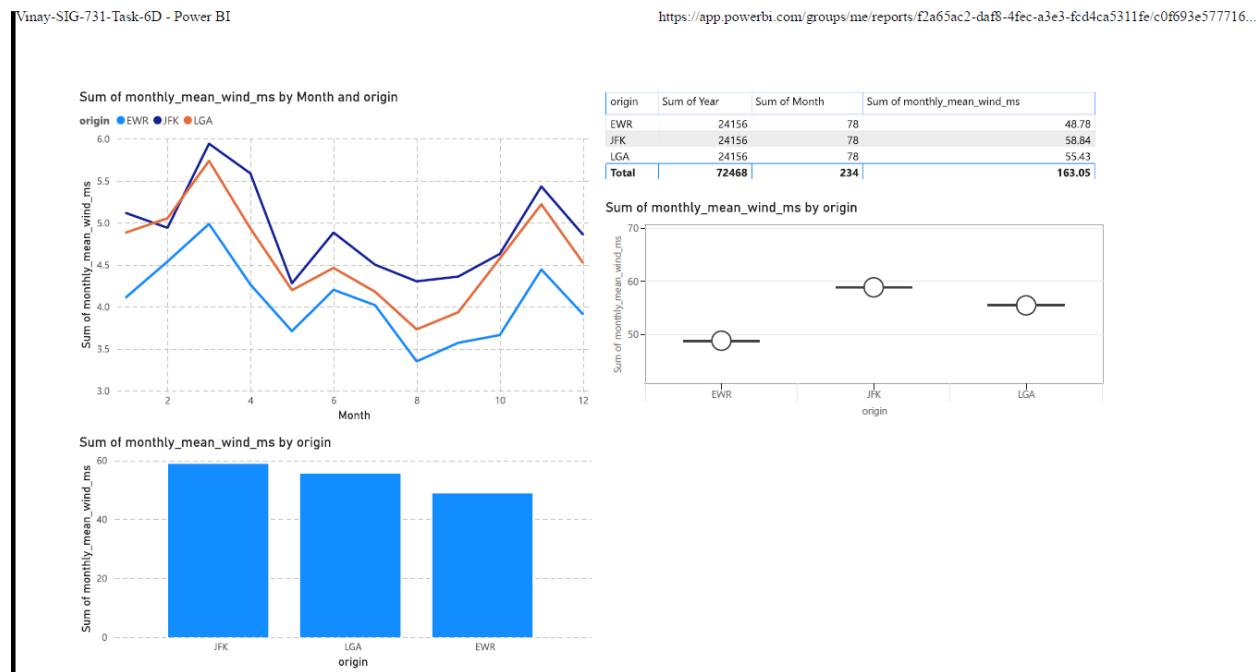
The table chart displays exact monthly mean wind speed values by airport, supporting transparency and confirming the seasonal and inter-airport patterns observed in the graphical visualizations

## 10.d Final Outliers Removed

All the Outliers have been removed

Conclusion:

The Final Power-BI Report has been published to:



<https://app.powerbi.com/groups/me/reports/f2a65ac2-daf8-4fec-a3e3-fcd4ca5311fe/c0f693e5777160b349ed?experience=power-bi>

**Artifacts:**

**Public Repository:** "<https://github.com/SriVinayaka/Vinay-Srinivasan-SIG-731-Task-6D/>"

**Final “Power-BI Advanced Query” Model Code:**

```
let
    // =====
    // LOAD EXCEL DATA
    // =====

    Source = Excel.Workbook(
        File.Contents("D:\power-bi\SIG-731-Task-6D\data\raw_weather.xlsx"),
        null,
        true
    ),

    RawWeatherSheet = Source{[Item="raw_weather", Kind="Sheet"]}[Data],

    PromotedHeaders = Table.PromoteHeaders(
        RawWeatherSheet,
        [PromoteAllScalars=true]
    ),
    // =====
    // SAFE TYPE CONVERSION
    // =====
```

```

SafeTypes = Table.TransformColumns(
    PromotedHeaders,
    {
        {"origin", each Text.From(_), type text},
        {"year", each try Int64.From(_) otherwise null, Int64.Type},
        {"month", each try Int64.From(_) otherwise null, Int64.Type},
        {"day", each try Int64.From(_) otherwise null, Int64.Type},
        {"hour", each try Int64.From(_) otherwise null, Int64.Type},
        {"wind_speed", each try Number.From(_) otherwise null, type number}
    }
),
// =====
// CORRECTED DATETIME
// =====

```

```

AddedCorrectedTime = Table.AddColumn(
    SafeTypes,
    "CorrectedTime",
    each
        if [year] <> null and [month] <> null and [day] <> null and [hour] <> null
        then #datetime([year], [month], [day], [hour], 0, 0)
        else null,

```

```
    type datetime
),
// =====
// SI UNIT CONVERSION
// =====

WindSpeed_ms = Table.AddColumn(
    AddedCorrectedTime,
    "wind_speed_ms",
    each if [wind_speed] <> null then [wind_speed] * 0.44704 else null,
    type number
),
// =====
// DAILY MEAN WIND SPEED
// =====

AddedDate = Table.AddColumn(
    WindSpeed_ms,
    "Date",
    each if [CorrectedTime] <> null then Date.From([CorrectedTime]) else null,
    type date
),
DailyMeanWind = Table.Group(
```

```
AddedDate,  
{"origin", "Date"},  
{  
{  
"daily_mean_wind_ms",  
each List.Average(List.RemoveNulls([wind_speed_ms])),  
type number  
}  
}  
),
```

```
// =====  
// IQR OUTLIER REMOVAL (SAFE)  
// =====
```

```
NonNullValues =  
List.RemoveNulls(DailyMeanWind[daily_mean_wind_ms]),
```

```
Q1 = List.Percentile(NonNullValues, 0.25),  
Q3 = List.Percentile(NonNullValues, 0.75),  
IQR = Q3 - Q1,
```

```
LowerBound = Q1 - 1.5 * IQR,  
UpperBound = Q3 + 1.5 * IQR,
```

```
DailyNoOutliers = Table.SelectRows(
```

```
DailyMeanWind,  
each  
    [daily_mean_wind_ms] <> null and  
    [daily_mean_wind_ms] >= LowerBound and  
    [daily_mean_wind_ms] <= UpperBound  
,  
  
// =====  
// MONTHLY MEAN (NO OUTLIERS)  
// =====  
  
AddedYear = Table.AddColumn(  
    DailyNoOutliers,  
    "Year",  
    each Date.Year([Date]),  
    Int64.Type  
,  
  
AddedMonth = Table.AddColumn(  
    AddedYear,  
    "Month",  
    each Date.Month([Date]),  
    Int64.Type  
,  
  
MonthlyMeanWind = Table.Group(
```

```
AddedMonth,  
{"origin", "Year", "Month"},  
{  
    {  
        "monthly_mean_wind_ms",  
        each List.Average(List.RemoveNulls([daily_mean_wind_ms])),  
        type number  
    }  
}  
)  
  
in
```

MonthlyMeanWind