1.What is the average temperature (first value in each row) recorded in this dataset?

Average of temperature\_fahrenheit2

76.80356531

2. How does the relative humidity (third value in each row) change over the recorded time?

Average of humidity\_percentage2

72.40102916

3. Is there any pattern in the temperature and humidity correlation?

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| At 66°F, humidity is 78% at the first two timestamps. |  |  |  |  |  |
| As temperature remains constant (66°F), an increase in dew point (from 59°F to 61°F) causes humidity to rise to 83%. | | | | | |
| When temperature drops to 64°F and the dew point remains at 61°F, humidity increases further to 88%. | | | | |  |

4. What is the predominant weather condition recorded in this dataset?

|  |  |
| --- | --- |
| The predominant weather condition recorded in this dataset is **Fog**. Every entry in the dataset indicates "Fog" in the condition column. |  |

5. How many unique weather conditions are present in the dataset?

From the provided dataset, there is only one unique weather condition recorded: Fog

6. Are there any changes in the wind speed or direction in this dataset?

Based on the provided dataset, there are no changes in wind speed or direction. Here's why:

1. Wind Direction: The "wind" column consistently states "CALM," indicating no significant directional wind changes.

2. Wind Speed and Gusts: Both "wind\_speed\_mph" and "wind\_gust\_mph" remain at 0 throughout the data, showing no variation in wind speed or gust intensity.

This indicates that the wind conditions are stable, with calm and still air throughout the recorded timestamps.

7. What is the range of barometric pressure (ninth value in each row) observed in this dataset?

Max of pressure\_in Min of pressure\_in2

30.15 29.44

8. Is there a relationship between temperature and barometric pressure?

To analyze the relationship between temperature and barometric pressure in this dataset, we can look at the two columns: temperature and pressure.

Here is a brief step-by-step outline of the relationship:

Temperature (°F): Ranges from 64°F to 66°F.

Pressure (in): Ranges from 30.03 in to 30.06 in.

We can observe the following trends:

The temperature remains relatively stable, fluctuating between 64°F and 66°F during this period.

The pressure shows a slight decrease from 30.06 in to 30.03 in as time progresses, but the changes are small (around 0.03 inches of mercury).

Relationship Summary:

There is a negative correlation between temperature and pressure in this dataset, though the change is quite small.

As the temperature stays relatively constant (around 65°F), the pressure slightly drops.

9. During which time periods is fog reported as the weather condition?

|  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- |
| Fog is reported as the weather condition during the following time periods in the dataset: | | | | | | | | |
|  |  |  |  |  |  |  |  |  |
| 1. 1/1/2023 0:00:00 | |  |  |  |  |  |  |  |
| 2. 1/1/2023 0:30:00 | |  |  |  |  |  |  |  |
| 3. 1/1/2023 1:00:00 | |  |  |  |  |  |  |  |
| 4. 1/1/2023 1:30:00 | |  |  |  |  |  |  |  |
| 5. 1/1/2023 2:00:00 | |  |  |  |  |  |  |  |
|  |  |  |  |  |  |  |  |  |
| These entries all indicate fog as the recorded weather condition. | | | | | | |  |  |
|  |  |  |  |  |  |  |  |  |

10. Are there any time periods with no fog, based on the given dataset?

|  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| Based on the given dataset, all recorded time periods (from 0:00:00 to 2:00:00 on 1/1/2023) have "Fog" as the weather condition. Therefore, there are no time periods without fog in the provided dataset. | | | | | | | | | | | | | | | | | | | |
|  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |

11. What is the lowest recorded temperature, and when does it occur?

Min of temperature\_fahrenheit

50

12. What is the highest recorded relative humidity, and during what time does it occur?

Max of humidity\_percentage

94

13. Is there a consistent trend in the visibility across the dataset (if "Fog" implies reduced visibility)?

The consistent occurrence of "Fog" across all rows suggests that visibility is limited throughout the recorded period.

14. How many distinct timestamps are recorded in the dataset?

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| The dataset contains 5 distinct timestamps, which are: | | | | | |
|  |  |  |  |  |  |
| 1. 1/1/2023 0:00:00 | |  |  |  |  |
| 2. 1/1/2023 0:30:00 | |  |  |  |  |
| 3. 1/1/2023 1:00:00 | |  |  |  |  |
| 4. 1/1/2023 1:30:00 | |  |  |  |  |
| 5. 1/1/2023 2:00:00 | |  |  |  |  |

15. What is the total duration covered by this dataset?

Sum of time

1429.23125

16. Are there any repeating records (duplicate rows) in the dataset?

Upon reviewing the dataset, there are no repeating records (duplicate rows) in the data. Each row represents a unique timestamp with corresponding values for temperature, dew point, humidity, wind conditions, wind speed, pressure, precipitation, and weather condition.

17. What is the frequency of data recording in this dataset (e.g., hourly, half-hourly)?

The frequency of data recording in this dataset is every 30 minutes. The timestamps in the "time" column are spaced at half-hour intervals, such as 0:00:00, 0:30:00, 1:00:00, 1:30:00, and so on.

18. Is there any missing or anomalous data in the dataset (e.g., unexpected values)?

No missing data is present in any of the columns. Every row has a value for all fields (date, time, temperature, dew point, humidity, wind, wind speed, wind gust, pressure, precipitation, and condition).

19. How does the recorded data vary across different times of the day?

Temperature: Slight decrease over time (66°F to 64°F).

Dew Point: A slight increase early in the morning (59°F to 61°F).

Humidity: Gradual increase in humidity from 78% to 88%.

Wind: Constantly calm, no variation.

Barometric Pressure: Small decrease (30.06 inHg to 30.03 inHg).

Precipitation: No variation, as there’s no recorded precipitation.

Condition: Constant fog throughout the period.

20. If extended, how might this dataset be used to predict future weather conditions?

If the dataset is extended, it can be used to predict future weather conditions by leveraging various machine learning or statistical modeling techniques. Here’s how it could be done:

Temperature & Dew Point: These are key factors in predicting future weather, especially fog or cloud conditions. The difference between the two can help in predicting the likelihood of fog or other precipitation.

Humidity: This directly impacts weather patterns, including cloud formation, precipitation, and fog. High humidity often leads to fog, while low humidity can indicate clearer skies.

Wind Data: Wind speed and gusts can influence weather patterns like storms or calm conditions. The wind’s direction can also give insights into upcoming weather shifts.

Barometric Pressure: Changes in pressure are often early indicators of weather changes. A dropping pressure may indicate the approach of a storm, while rising pressure suggests clearing weather.

Condition (Fog): The target variable could be the condition, which could be used to predict when fog or clear skies might occur based on historical patterns of the other features.