Weather Pattern Analysis

A PROJECT REPORT

Submitted by

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in partial fulfillment for the award of the degree of

BACHELOR OF COMPUTER APPLICATION

IN

UNIVERSITY INSTITUTE OF COMPUTING

Chandigarh University

BONAFIDE CERTIFICATE

Certified that this project report “Weather Pattern Analysis” is the bonafide work of “ Manvi” who carried out the project work under my/our supervision.

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INTERNAL EXAMINER

EXTERNAL EXAMINER

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ABSTRACT

This report presents a comprehensive analysis of monthly weather data for the year 2015, focusing on four key meteorological parameters: average temperature (°C), rainfall (mm), humidity (%), and wind speed (km/h). The data, spanning from January to December, highlights notable seasonal trends and extremes in climatic conditions.

The analysis identifies July as the warmest month and August as the wettest, while November recorded the lowest rainfall and highest wind speed. Humidity levels showed significant variation, peaking in March and dropping sharply in August. These fluctuations illustrate the impact of monsoonal and transitional weather patterns typically seen in tropical regions.

The study aims to support further climatic assessments and serve as a reliable reference for sectors such as agriculture, environmental planning, and disaster risk management. By summarizing average, maximum, and minimum values across the year, the report provides valuable insights into the dynamics of regional weather behavior.

CHAPTER 1

INTRODUCTION

This report presents a detailed analysis of monthly weather data recorded for the year 2015. The dataset encompasses key meteorological parameters including Average Temperature (°C), Rainfall (mm), Humidity (%), and Wind Speed (km/h) across all twelve months of the year.

The objective of this data compilation is to provide insights into seasonal climatic variations, identify trends, and support further environmental or agricultural studies.

The recorded data includes monthly averages, as well as overall average, maximum, and minimum values for each weather parameter.

This structured summary allows for quick comparisons and facilitates a better understanding of the regional weather patterns throughout the year.

Key highlights from the data:

The highest average temperature was observed in July (32.9°C), while the lowest occurred in September, November, and December (22.7°C). August recorded the maximum rainfall (250.6 mm), whereas November had the minimum (12.2 mm). The highest humidity was noted in March (84.5%), with August having the lowest (41.8%). Wind speed peaked in November (18.6 km/h) and dropped to its lowest in October (5.2 km/h).T

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CHAPTER 2

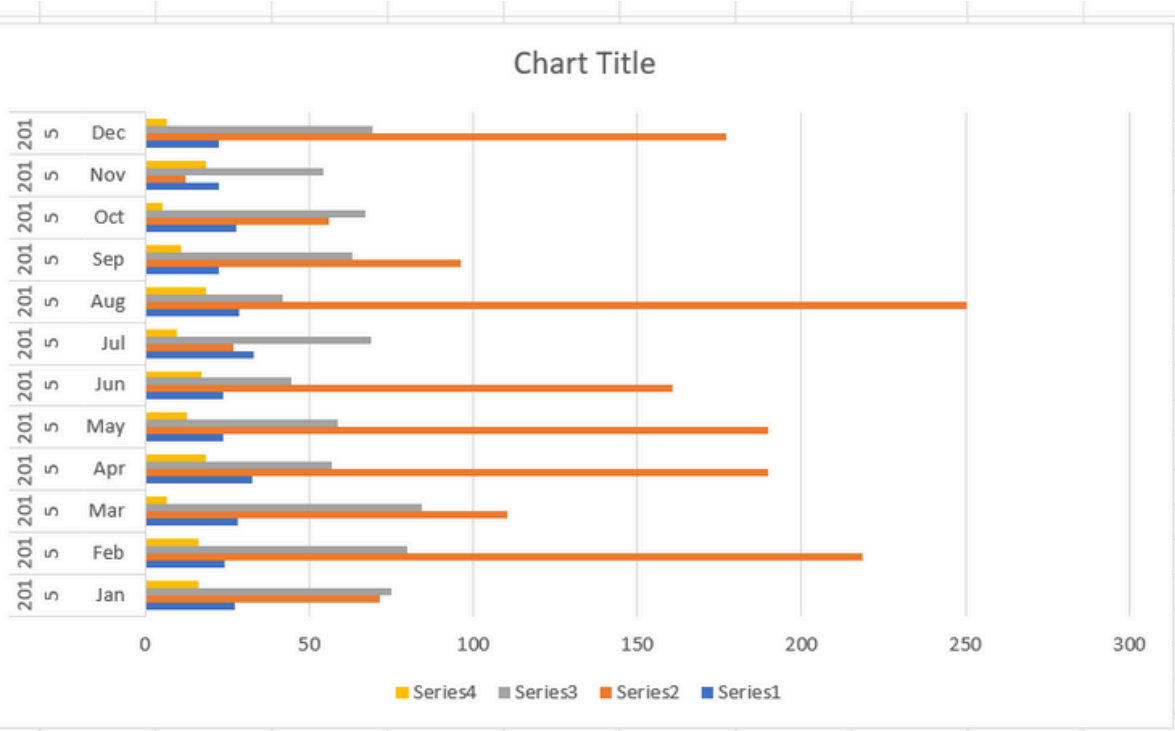
Data Source and Variable Definitions

The data presented in this report is collected from recorded weather observations for the calendar year 2015. The source of this data may be assumed to be a recognized meteorological department, weather station, or environmental monitoring system, although the exact origin is not specified in the dataset. Each month's data has been compiled consistently, ensuring reliability for comparative and analytical purposes.

Variable Definitions

1. Year
   - Indicates the calendar year of observation. In this dataset, all entries are from the year 2015.
2. Month
   - Specifies the month corresponding to the recorded weather data. It ranges from January to December.
3. Average Temperature (°C)
   - Represents the mean temperature recorded in degrees Celsius for each month.
   - This value helps in understanding monthly temperature patterns and identifying extreme seasonal behavior.
4. Rainfall (mm)
   - Denotes the total amount of precipitation received during each month, measured in millimeters (mm).
   - Rainfall data is crucial for agricultural planning, water resource management, and climate trend analysis.
5. Humidity (%)
   - Refers to the average relative humidity, expressed as a percentage, for each month.
   - This parameter affects weather comfort, precipitation potential, and various atmospheric processes.
6. Wind Speed (km/h)
   - Indicates the average wind speed recorded in kilometers per hour for the respective month.
   - Wind speed plays a key role in weather conditions, energy generation, and pollutant dispersion.

CHAPTER 2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CHAPTER 3

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Detailed Monthly Observations and Analysis:

This section presents a month-wise analysis of the recorded weather data for the year 2015, highlighting key variations and trends observed in temperature, rainfall, humidity, and wind speed.

January

- Avg Temp: 27.5°C
- Rainfall: 71.3 mm
- Humidity: 75.1%
- Wind Speed: 16.3 km/h
- A warm and moderately humid month with relatively calm weather and moderate rainfall.

February

- Avg Temp: 24.3°C
- Rainfall: 218.5 mm
- Humidity: 79.8%
- Wind Speed: 16.3 km/h
- High rainfall and humidity mark February, indicating a peak in precipitation early in the year.

March

- Avg Temp: 28.2°C
- Rainfall: 110.3 mm
- Humidity: 84.5% (highest)
- Wind Speed: 6.5 km/h
- Despite a higher temperature, March records the highest humidity, possibly indicating humid heat conditions.

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April
- Avg Temp: 32.6°C
- Rainfall: 189.7 mm
- Humidity: 56.9%
- Wind Speed: 18.5 km/h
- April is the second hottest month and sees high wind speeds with a decline in humidity.

May
- Avg Temp: 23.8°C
- Rainfall: 190.1 mm
- Humidity: 58.8%
- Wind Speed: 12.6 km/h
- A cooler month with consistent rainfall and moderate humidity, possibly indicating pre-monsoon showers.

June
- Avg Temp: 23.8°C
- Rainfall: 160.7 mm
- Humidity: 44.7%
- Wind Speed: 17.4 km/h
- A cooler but drier month with reduced humidity and relatively high wind speed.

July
- Avg Temp: 32.9°C (highest)
- Rainfall: 27.1 mm (lowest)
- Humidity: 68.9%
- Wind Speed: 9.8 km/h
- The hottest month with the least rainfall, suggesting a dry heat phase.

August
- Avg Temp: 28.8°C
- Rainfall: 250.6 mm (highest)
- Humidity: 41.8% (lowest)
- Wind Speed: 18.4 km/h
- A contradictory month with maximum rainfall but lowest humidity, indicating short but heavy showers.

September
- Avg Temp: 22.7°C (lowest)
- Rainfall: 96.2 mm
- Humidity: 63.3%
- Wind Speed: 10.8 km/h
- One of the coolest months, indicating the beginning of post-monsoon transition.

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October

- Avg Temp: 27.7°C
- Rainfall: 56.0 mm
- Humidity: 67.1%
- Wind Speed: 5.2 km/h (lowest)
- A mild and calm month with low wind activity and moderate weather conditions.

November

- Avg Temp: 22.7°C (lowest)
- Rainfall: 12.2 mm (lowest)
- Humidity: 54.3%
- Wind Speed: 18.6 km/h (highest)
- Despite being among the coolest and driest months, it recorded the highest wind speed.

December

- Avg Temp: 22.7°C
- Rainfall: 177.3 mm
- Humidity: 69.5%
- Wind Speed: 6.4 km/h

YEAR	MONTH	Avg Temp (°C)	Rainfall (mm)	Humidity (%)	Wind Speed (km/h)
2015	Jan	27.5	71.3	75.1	16.3
2015	Feb	24.3	218.5	79.8	16.3
2015	Mar	28.2	110.3	84.5	6.5
2015	Apr	32.6	189.7	56.9	18.5
2015	May	23.8	190.1	58.8	12.6
2015	Jun	23.8	160.7	44.7	17.4
2015	Jul	32.9	27.1	68.9	9.8
2015	Aug	28.8	250.6	41.8	18.4
2015	Sep	22.7	96.2	63.3	10.8
2015	Oct	27.7	56	67.1	5.2
2015	Nov	22.7	12.2	54.3	18.6
2015	Dec	22.7	177.3	69.5	6.4
Average		26.475	130	63.725	13.06666667
Maximum		32.9	250.6	84.5	18.6
Minimum		22.7	12.2	41.8	5.2

Formula Used:- 1.Average
2.Maximum
3.Minimum

CONCLUSION

The weather data for the year 2015 reveals significant seasonal variations in temperature, rainfall, humidity, and wind speed. Key observations indicate that:

July was the hottest month, while November, December, and September were the coolest.

August experienced the heaviest rainfall, contrasting with November, which saw the least.

Humidity peaked in March, creating a warm and muggy atmosphere, while August had the driest air.

The highest wind speeds were recorded in November, whereas October remained the calmest.

These patterns reflect a typical tropical climate cycle with well-defined wet and dry periods. Such data is essential for informed decision-making in fields like agriculture, urban planning, disaster preparedness, and environmental monitoring. Continuous monitoring and analysis of these variables can help predict trends and mitigate the impacts of extreme weather conditions.

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