WEATHER IMPACT ON ENERGY CONSUMPTION

Introduction

- Energy consumption is greatly influenced by changing weather conditions.
- Understanding this relationship helps improve planning and resource efficiency.

OBJECTIVE

- To analyze how factors like temperature,humidity,and rainfall affect daily energy use.
- To visualize and model the relationship between weather and energy consumption.

DATA COLLECTION

- Daily weather data : Temperature, Humidity, Rainfall, Wind speed.

- Metered energy usage: Daily or Hourly readings.

DATA COLLECTION

Data was processed and visualized using sql, python(jupyter), and power bi

We used real meter readings and weather records for analysis

Weather Forecast Data Captures Daily Information on Temperature, Humidity, Rainfall and Climate Variables

Record ID	ForecastDate	City	TemperatureHigh	Temperature Low	Humidity Percent	WindSpeed KmH	Rainfall MM	Atmospheric Pressure	Energy Consumption	
1	25-10-2025	Bangalore	30.5	21.2	68.5	12.4	2.3	1012.5	118.7	
2	26-10-2025	Bangalore	31	20.9	70.1	15	1.2	1013	120	
3	27-10-2025	Bangalore	29.5	19.8	72	10.5	5.6	1011.2	110.4	
4	28-10-2025	Bangalore	28.7	18.9	73.5	9.9	7.2	1010.8	105.6	
5	29-10-2025	Bangalore	29.2	20	74.1	13.2	3.8	1012	107.8	
6	30-10-2025	Bangalore	30.8	21.3	67.8	14	2	1012.7	122.9	
7	31-10-2025	Bangalore	31.4	22.1	66	11.8	1	1014.2	125.1	
8	01-11-2025	Bangalore	28.9	19.2	76.4	8.7	8.9	1010.1	102.5	
9	02-11-2025	Bangalore	30.2	20.5	70.7	12.9	3	1011.8	115.3	
10	03-11-2025	Bangalore	29.7	21	73	15.4	4.5	1012.2	109.9	

Weather Forecast and Energy Consumption Table

	Record ID	Forecast Date	City	Temperature High	Temperature Low
0	1	2025-10-25	Bangalore	30.5	21.2
1	2	2025-10-26	Bangalore	31.0	20.9
2	3	2025-10-27	Bangalore	29.5	19.8
3	4	2025-10-28	Bangalore	28.7	18.9
4	5	2025-10-29	Bangalore	29.2	20.0

	Humidity Percent	Wind Speed Km H	Rainfall MM	Atmospheric Pressure
0	68.5	12.4	2.3	1012.5
1	70.1	15.0	1.2	1013.0
2	72.0	10.5	5.6	1011.2
3	73.5	9.9	7.2	1010.8
4	74.1	13.2	3.8	1012.0

	Energy Consumption
0	118.7
1	120.0
2	110.4
3	105.6
4	107.8

DATA CONSUMPTION

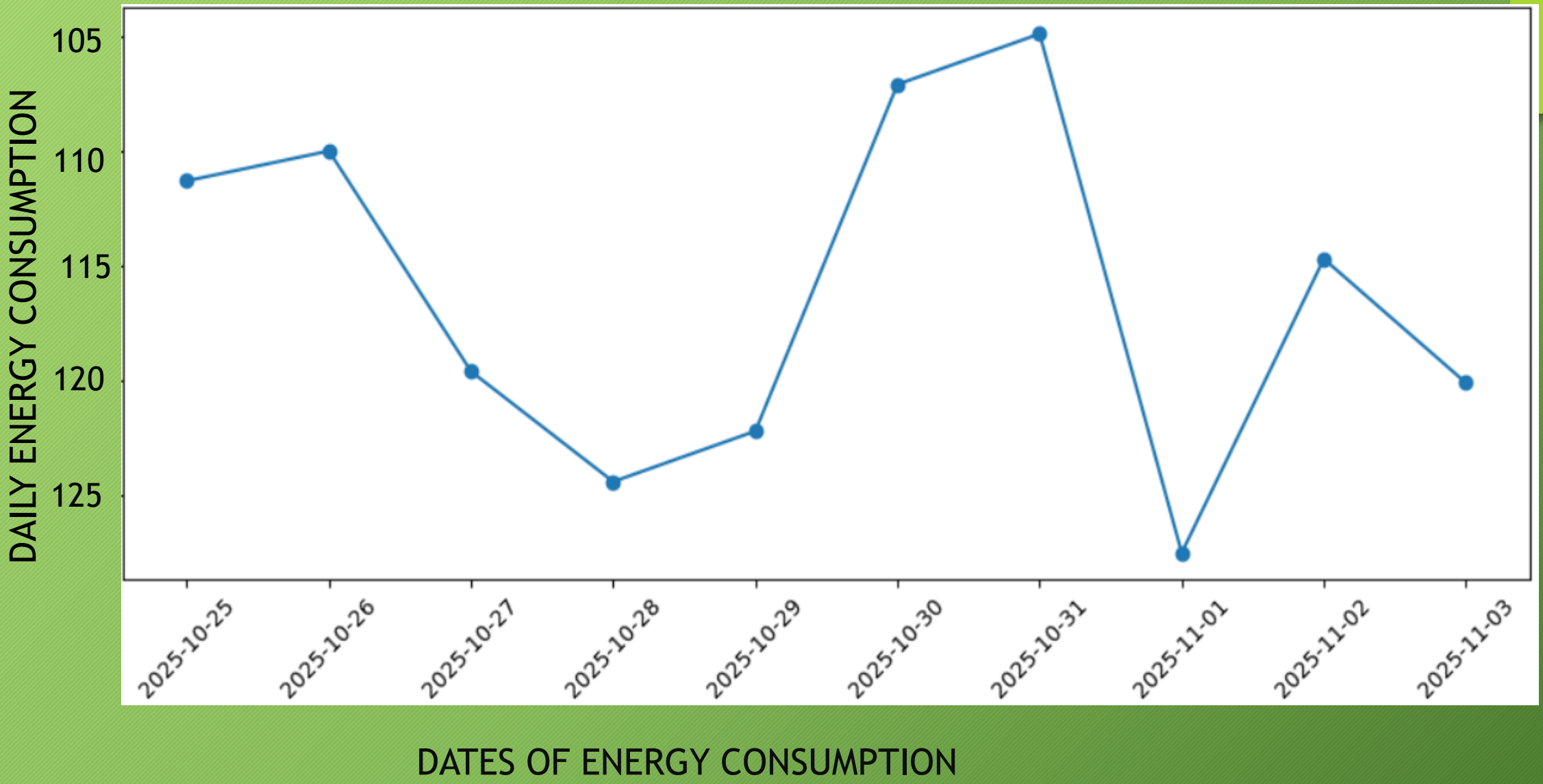
0	Record ID	10 non-null	int64
1	Forecast Date	10 non-null	datetime64[ns]
2	City	10 non-null	object
3	Temperature High	10 non-null	float64
4	Temperature Low	10 non-null	float64
5	Humidity Percent	10 non-null	float64
6	Wind Speed Km H	10 non-null	float64
7	Rainfall MM	10 non-null	float64
8	Atmospheric Pressure	10 non-null	float64
9	Energy Consumption	10 non-null	float64
10	Day Type	10 non-null	object

D types: datetime64[ns](1), float64(7), int64(1), object(2)
memory usage: 1012.0+ bytes
None

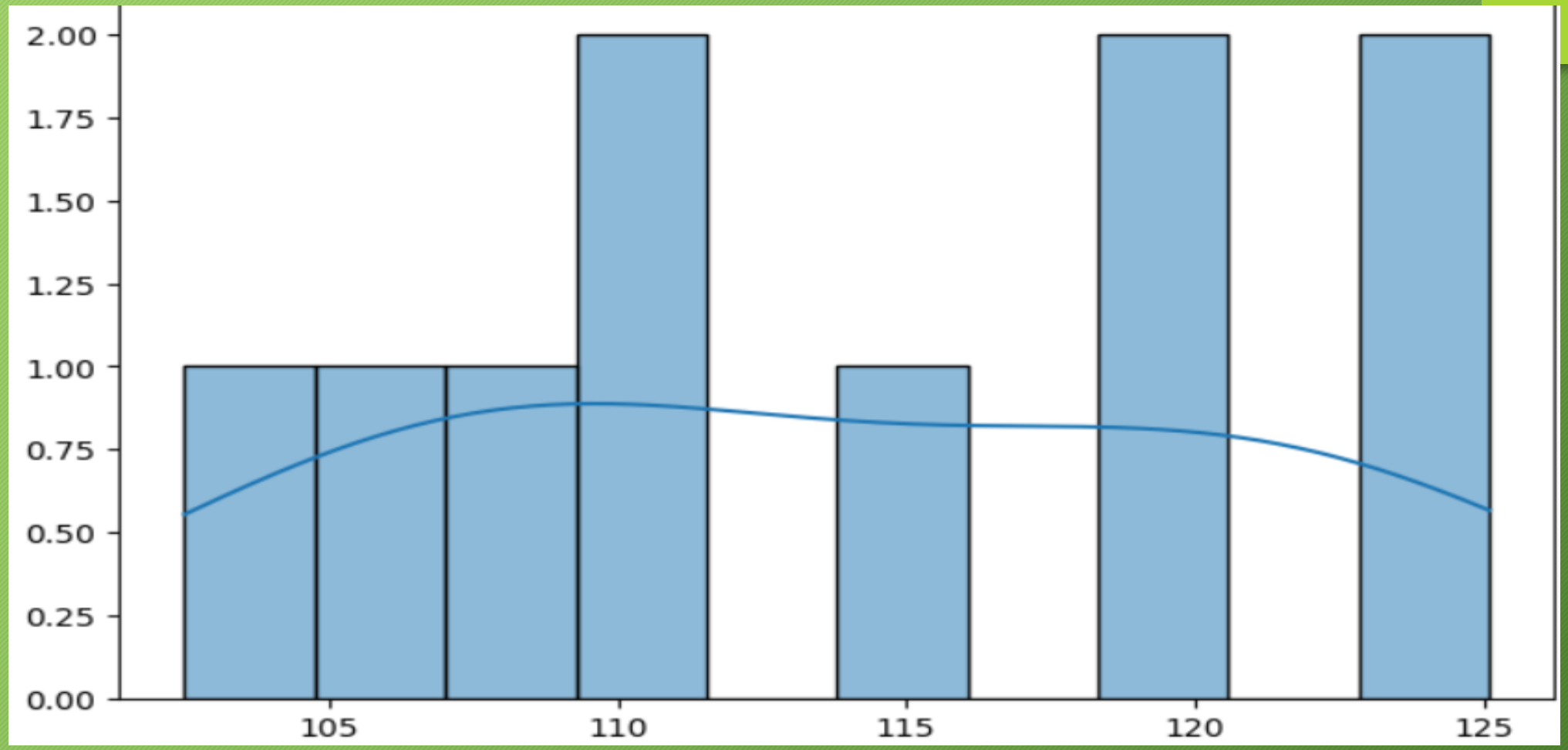
VISUAL DESCRIPTIONS

- LINE CHART
- BAR CHART
- SCATTER PLOT
- CORRELATION

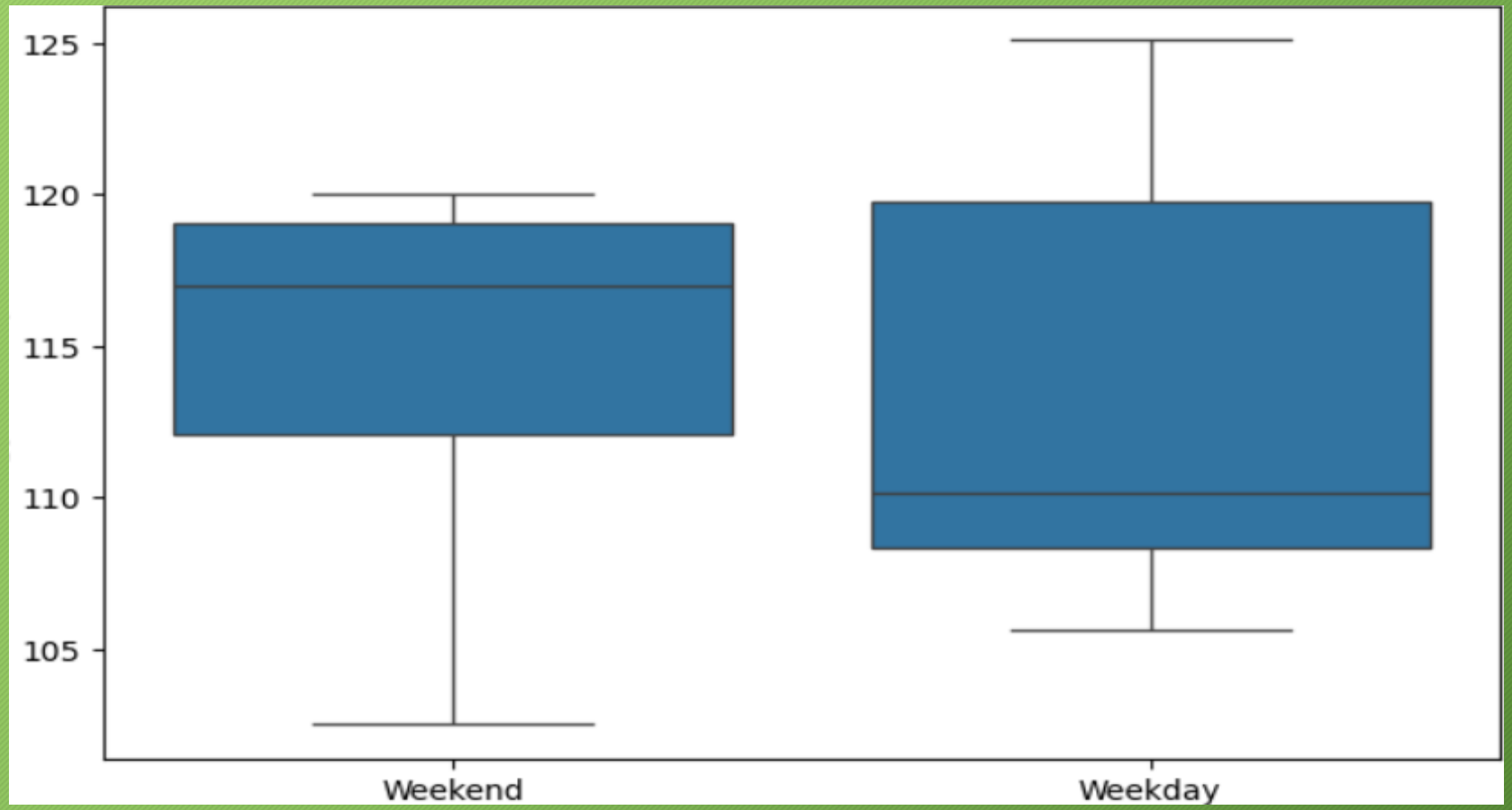
LINE CHART


DAILY ENERGY CONSUMPTION
105
110
115
120
125
2025-10-25
2025-10-26
2025-10-27
2025-10-28
2025-10-29
2025-10-30
2025-10-31
2025-11-01
2025-11-02
2025-11-03
DATES OF ENERGY CONSUMPTION

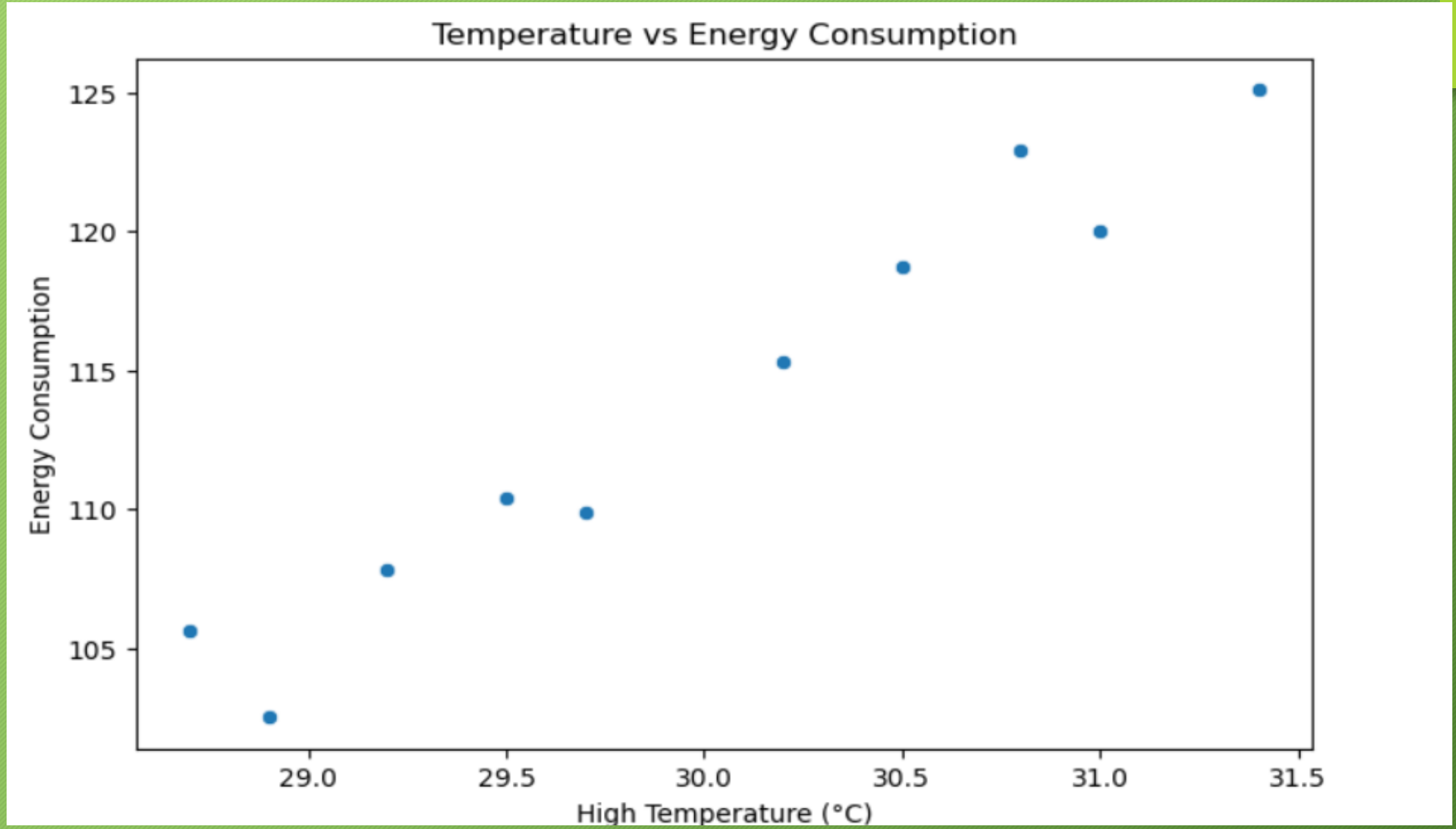
DAILY ENERGY CONSUMPTION



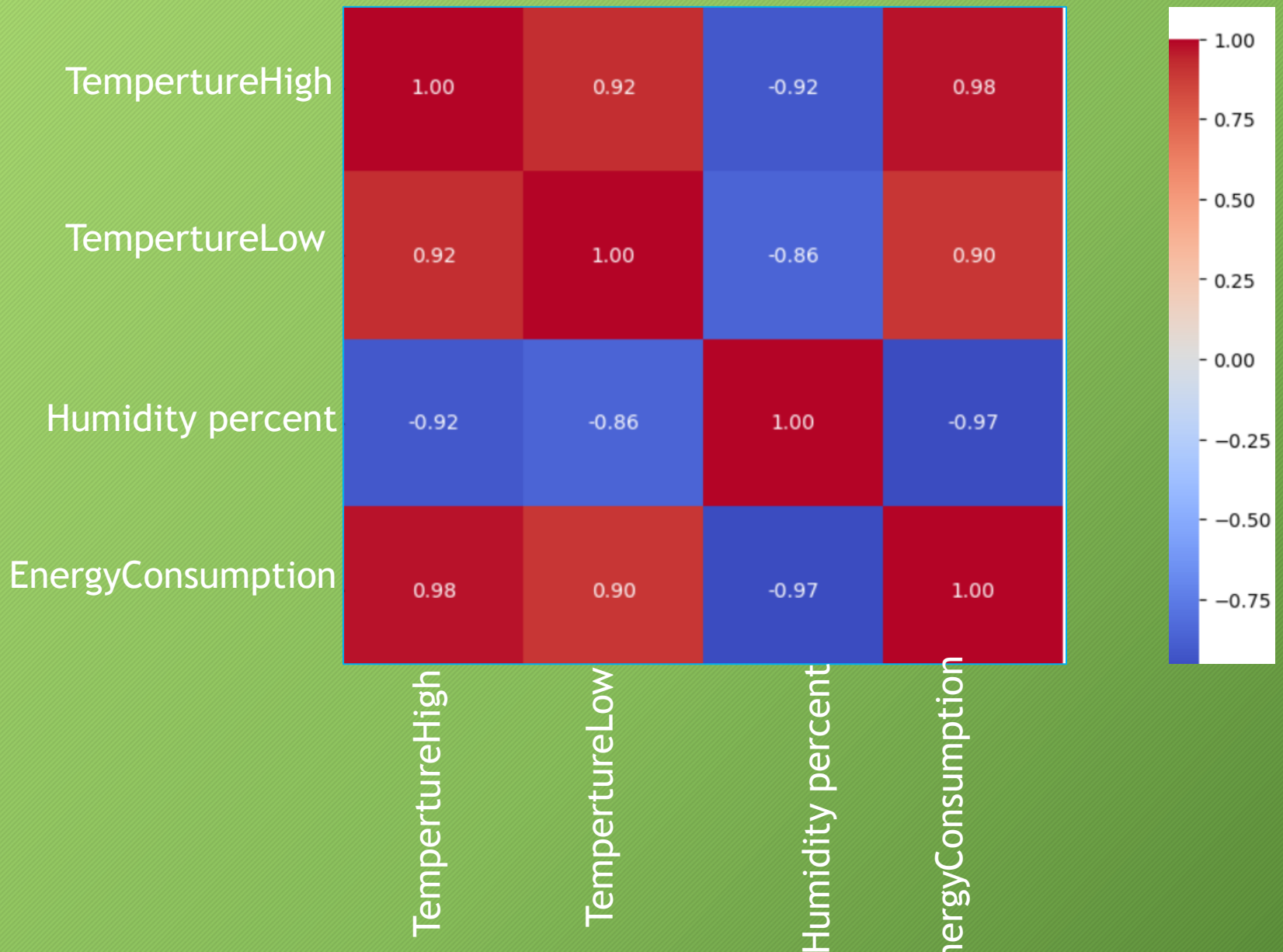
WEEKEND VS WEEKDAYS CONSUMPTION



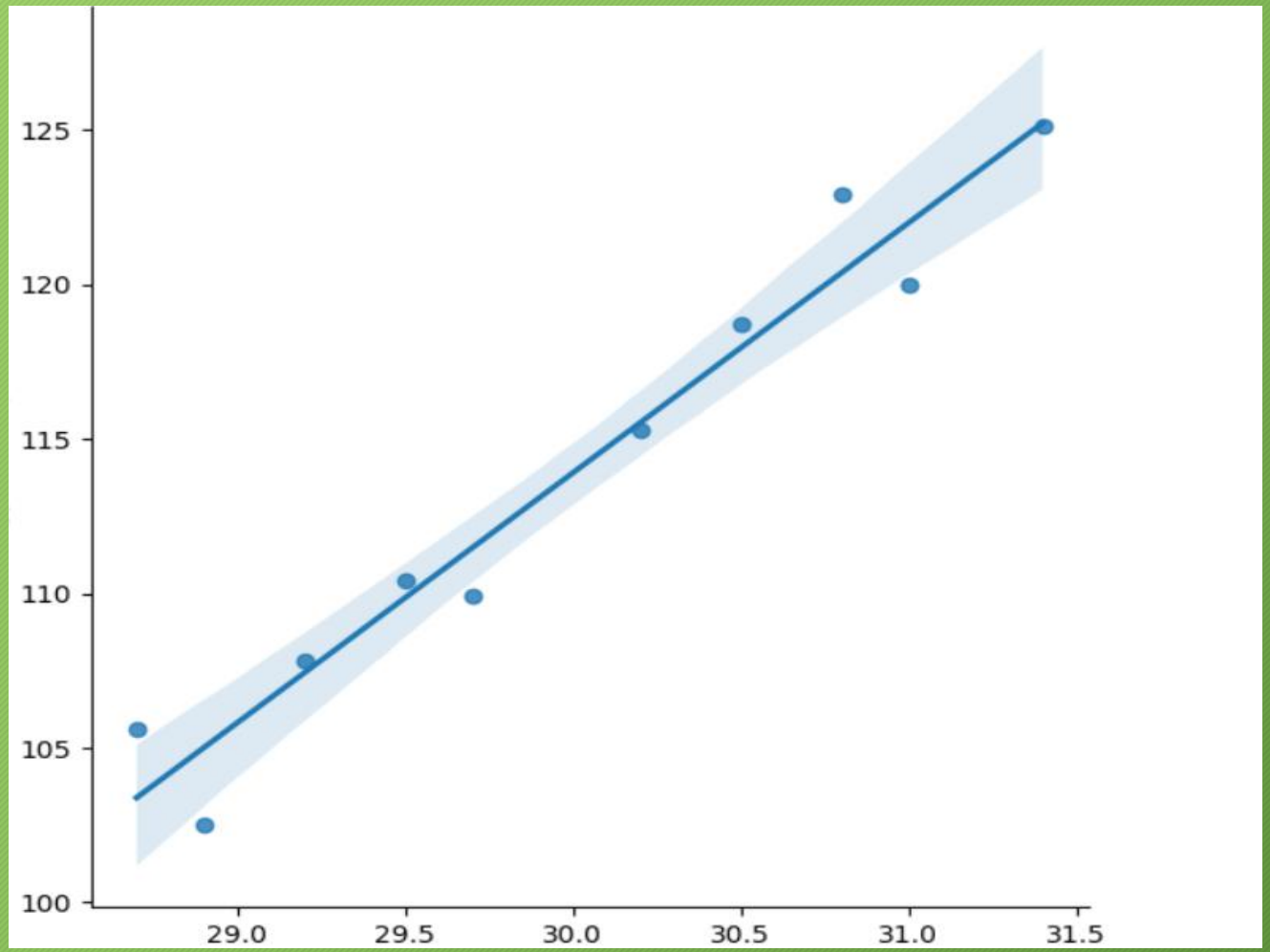
SCATTER PLOT



HEAT MAP


TempertureHigh
TempertureLow
Humidity percent
EnergyConsumption
1.00
0.92
-0.92
0.98
0.92
1.00
-0.86
0.90
-0.92
-0.86
1.00
-0.97
0.98
0.90
-0.97
1.00
TempertureHigh
TempertureLow
Humidity percent
1.00
0.75
0.50
0.25
0.00
−0.25
−0.50
−0.75

TEMPERATURE VS ENERGY



KEY INSIGHTS AND INTERPRETATION

- There is clear, positive correlation between hot weather and higher energy usage.
- Energy use patterns change on weekends versus weekdays, during different weather events

This project demonstrates how weather factors can significantly impact daily energy use.
By combing SQL, PYTHON and POWER BI, we have uncovered meaningful patterns and trends in data.
These insights can help optimize energy planning and support data-driven decision making in the future.

CONCLUSION

- Weather factors have a direct and measurable effect on energy consumption.
- Insights from this analysis can help optimize energy distribution and reduce waste.

THANK YOU

PRESENTation by : Kavana S , Amrutha T N

Government first grade college
Yelahanka nes Bangalore