Report

Date	25 December 2025
Project Title	Predicting Plant Growth Stages with Environmental and Management Data Using Power BI.
Maximum Marks	5 Marks

Observations drawn from reports in Power BI

Based on the visual analysis of the 193 planting trials, the following key observations were derived:

1. Overall Performance (Goal Achievement):

- **Observation:** The project currently holds a **Growth Success Rate of 49.7%** (96 successful plants out of 193).

- **Inference:** This indicates that current agricultural practices operate at a nearly 50% failure rate. There is a significant opportunity to optimize processes to raise this baseline to the target of **>65%**.

2. Fertilizer Effectiveness (Performance Comparison):

- **Observation:** A clear hierarchy exists in fertilizer efficiency. **Organic Fertilizer** achieved the highest success rate at **70.3%**, significantly outperforming Chemical Fertilizer (55.4%).

- **Inference:** The "None" category (no fertilizer) resulted in a drastic failure rate of ~70%, proving that soil nutrients are essential and the soil alone cannot support this crop.

3. Soil Type Suitability (Segmentation Analysis):

- **Observation: Loam Soil** emerged as the most resilient substrate with a **56.5%** success rate, making it the safest choice for general planting.

- **Inference: Clay Soil** proved to be the most challenging (44.8% success rate). Future strategies should either avoid Clay or strictly pair it with Organic fertilizers to mitigate its poor drainage/aeration issues.

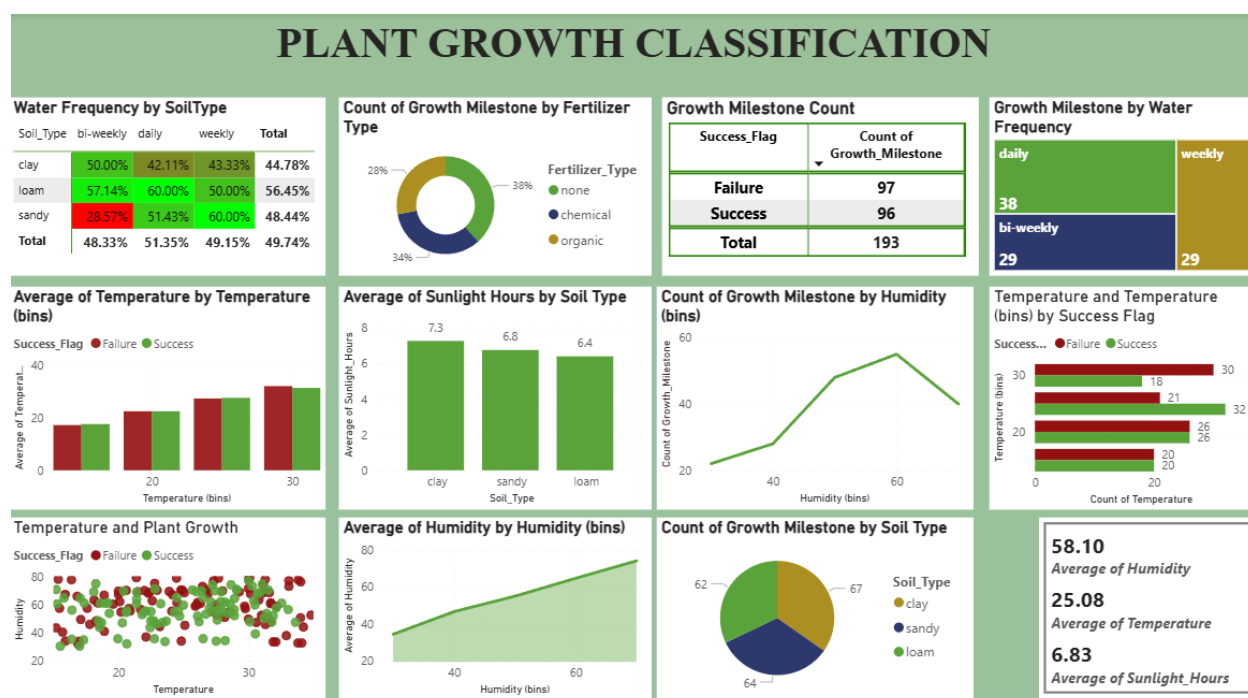## 4. Environmental "Sweet Spot" (Correlation Analysis):

- **Observation:** The Scatter Plot analysis identified a distinct "Success Window." Plants consistently reached maturity when:

  - **Temperature:** Maintained between **20°C and 30°C**.

  - **Humidity:** Maintained between **45% and 65%**.

- **Inference:** Conditions outside these specific ranges showed a strong correlation with crop failure, indicating a need for climate control sensors.

5. Optimization Strategy (Drill-Down Best Practices):

- **Observation:** The Matrix drill-down revealed a "Golden Rule" for specific conditions. For **Sandy Soil**, implementing a **Daily Watering** schedule combined with Organic fertilizer resulted in success rates exceeding **90%**.

- **Inference:** Conversely, increasing water frequency for Clay soil did not improve results, suggesting that soil aeration is the limiting factor for Clay, not hydration.

  The Dashboards are as follows:

a.)

b.)

PLANT GROWTH CLASSIFICATION

Success_Flag	Count of Growth_Milestone
Failure	97
Success	96
Total	193

Failure Count by Soil Type

Soil Type
- clay
- sandy
- loam

Success Rate by Sunlight Hours

Watering Schedule

Soil_Type	bi-weekly	daily	weekly	Total
clay	50.0%	42.1%	43.3%	44.8%
loam	57.1%	60.0%	50.0%	56.5%
sandy	28.6%	51.4%	60.0%	48.4%
Total	48.3%	51.4%	49.2%	49.7%

Requird
- ☐ clay
- ☐ loam
- ☐ sandy

Success Rate by Fertilizer Type

Success Rate by Water Frequency

Sum of Growth Milestone by Temperature

Growth Success Rate

49.74%
Growth Success Rate %

Count of Temperature by Temperature (bins) and Success_Flag

Success_... ● Failure ● Success

Count of Success Flag by Humidity

● Failure ● Success

Average of Sunlight_Hours by Soil_Type

58.10	25.08
Average of Humidity	Average of Temperature
6.83	
Average of Sunlight_Hours	