Data Collection and Preprocessing Phase

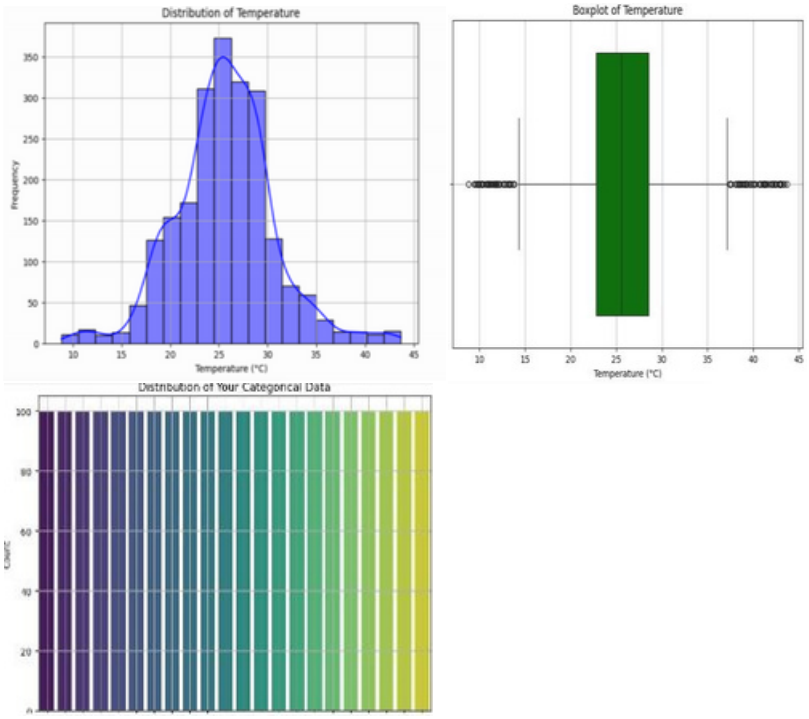
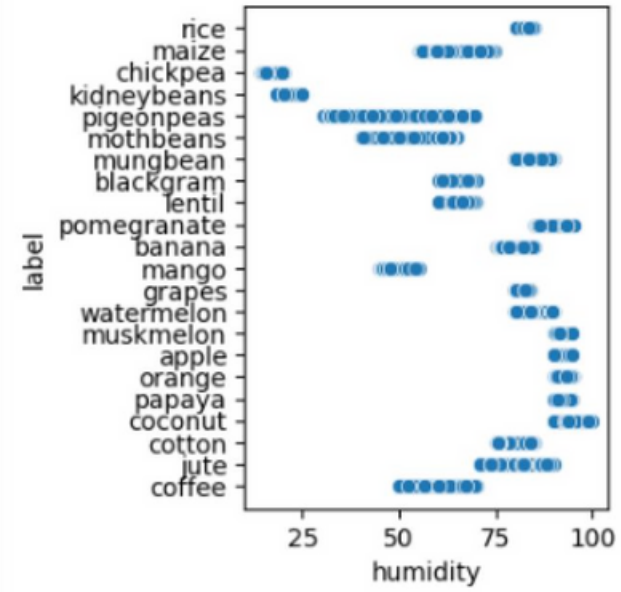
Date	21 June 2024
Team ID	740665
Project Title	Opticrop:Smart Agricultural Prodution Optimization Engine
Maximum Marks	6 Marks

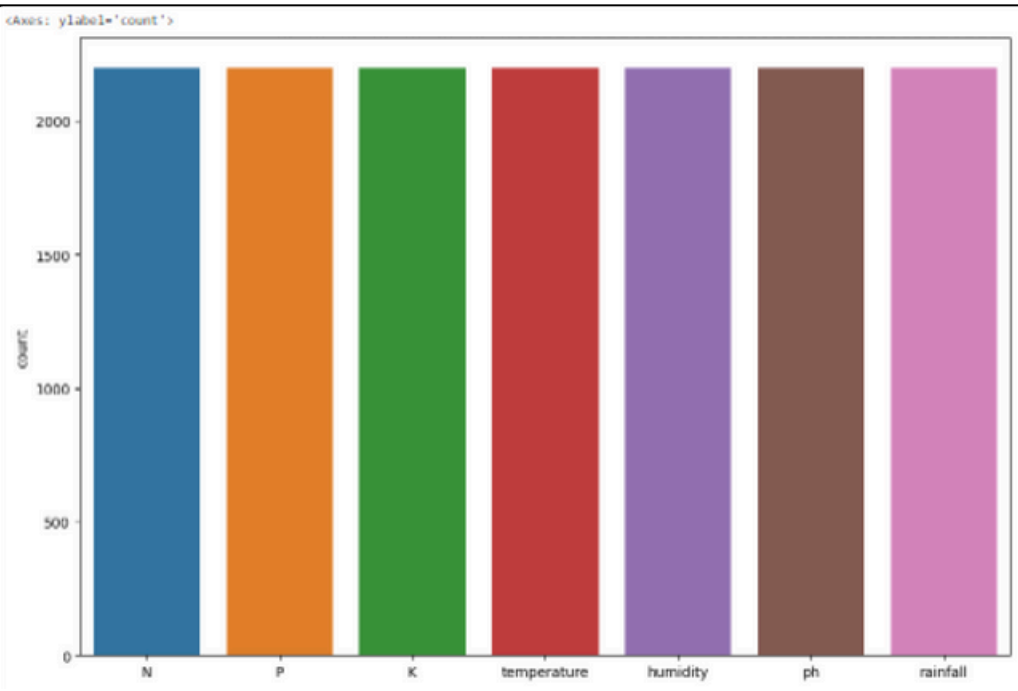
Data Exploration and Preprocessing Report

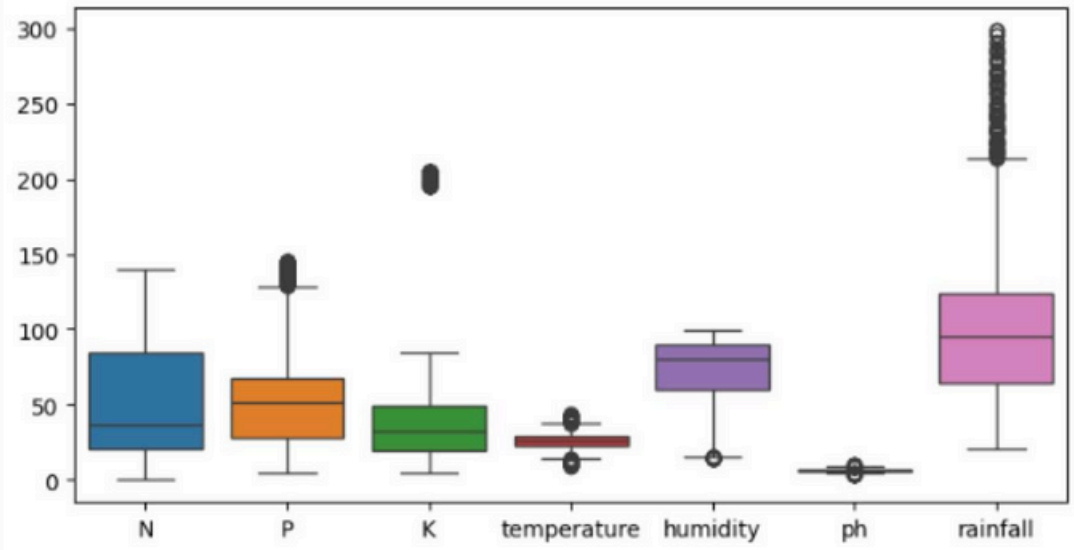
The purpose of this report is to outline the key steps and findings from the data exploration and preprocessing phase for the Opticrop project. This project aims to develop a Smart Agricultural Production Optimization Engine using data-driven approaches.the data sources are Agricultural sensor networks, satellite imagery, weather stations. The data exploration and preprocessing phases for the Opticrop project have been crucial in ensuring the quality and reliability of input data for subsequent modeling and optimization tasks. By addressing issues such as missing values, outliers, and data inconsistencies, we have prepared a clean and structured dataset ready for machine learning and analytics.

Section	Description
Data Overview	Dimension: 2200 rows × 8 columns Descriptive statistics: `df.describe()`

	N	P	K	temperature	humidity	ph	rainfall
count	2200.000000	2200.000000	2200.000000	2200.000000	2200.000000	2200.000000	2200.000000
mean	50.551818	53.362727	48.149091	25.616244	71.481779	6.469480	103.463655
std	36.917334	32.985883	50.647931	5.063749	22.263812	0.773938	54.958389
min	0.000000	5.000000	5.000000	8.825675	14.258040	3.504752	20.211267
25%	21.000000	28.000000	20.000000	22.769375	60.261953	5.971693	64.551686
50%	37.000000	51.000000	32.000000	25.598693	80.473146	6.425045	94.867624
75%	84.250000	68.000000	49.000000	28.561654	89.948771	6.923643	124.267508
max	140.000000	145.000000	205.000000	43.675493	99.981876	9.935091	298.560117

Univariate Analysis	
Bivariate Analysis	<Axes: > <Axes: xlabel='humidity', ylabel='label'> 

Multivariate Analysis	

Outliers and Anomalies	`plt.figure(figsize=(8,4))`
	`sns.boxplot(df)`
	
	`<Figure size 800x400 with 0 Axes>`
	`<Axes: >`
	 
	
	`Q1=df['P'].quantile(0.25)`
	`Q3=df['P'].quantile(0.75)`
	`IQR=Q3-Q1`
	`filter=(df['P']>=Q1-1.5*IQR) & (df['P']<=Q3+1.5*IQR)`
	`df=df.loc[filter]`

Data Preprocessing Code Sc reenshots	

Loading Data	`df = pd.read_csv('/content/Crop_recommendation.csv')`
	`df.head()`
	
	N P K temperature humidity ph rainfall label
	0 90 42 43 20.879744 82.002744 6.502985 202.935536 rice
	1 85 58 41 21.770462 80.319644 7.038096 226.655537 rice
	2 60 55 44 23.004459 82.320763 7.840207 263.964248 rice
	3 74 35 40 26.491096 80.158363 6.980401 242.864034 rice
	4 78 42 42 20.130175 81.604873 7.628473 262.717340 rice

Handling Missing Data	`df.isnull().sum()` N 0 P 0 K 0 temperature 0 humidity 0 ph 0 rainfall 0 label 0 dtype: int64
Data Transformation	-
Feature Engineering	Attached the codes in final submission.
Save Processed Data	-