CROP RECOMMENDATION

Omdena Algeria Project

Team - 2

INDIVIDUAL CONTRIBUTION

Dataset Import	01	Narimane Beneouakta
Data Exploration+ Presentation	02	Devarakonda Anuhya
Data Visualization	03	Satyaki Bhattacharjee
Main ModelWorkFlow	04	Aryan Ahuja
Model Training	05	Aryan Ahuja, Yash Sharma, Chit Hindocha
Model Comparison	06	Yash Sharma

OTHER MANAGEMENT WORK

Repository Management	01	Aryan Ahuja
Notebooks Management	02	Yash Sharma
Work on the PPT	03	Devarakonda Anuhya, Narimane, Chit Hindocha
Data Management	04	Satyaki Bhattacharjee

01

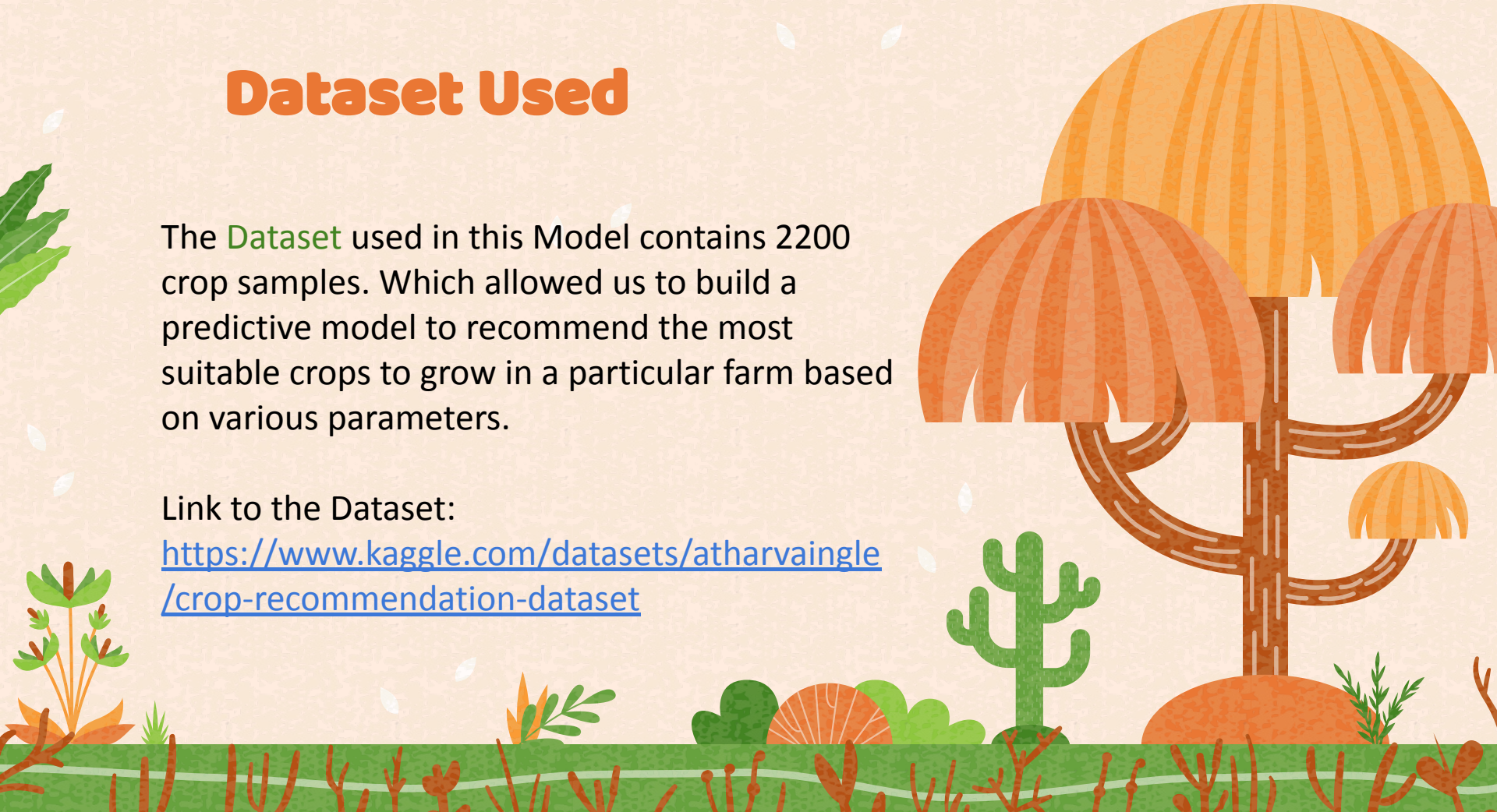
Problem Statement

Today, precision **farming** is popular. It enables farmers to make **well-informed decisions** regarding their farming tactics. Here, we access a **dataset** and create a prediction model that will suggest the best crops to plant on a certain farm depending on a **variety of factors**.

Dataset Used

The Dataset used in this Model contains 2200 crop samples. Which allowed us to build a predictive model to recommend the most suitable crops to grow in a particular farm based on various parameters.

Link to the Dataset:
https://www.kaggle.com/datasets/atharvaingle/crop-recommendation-dataset

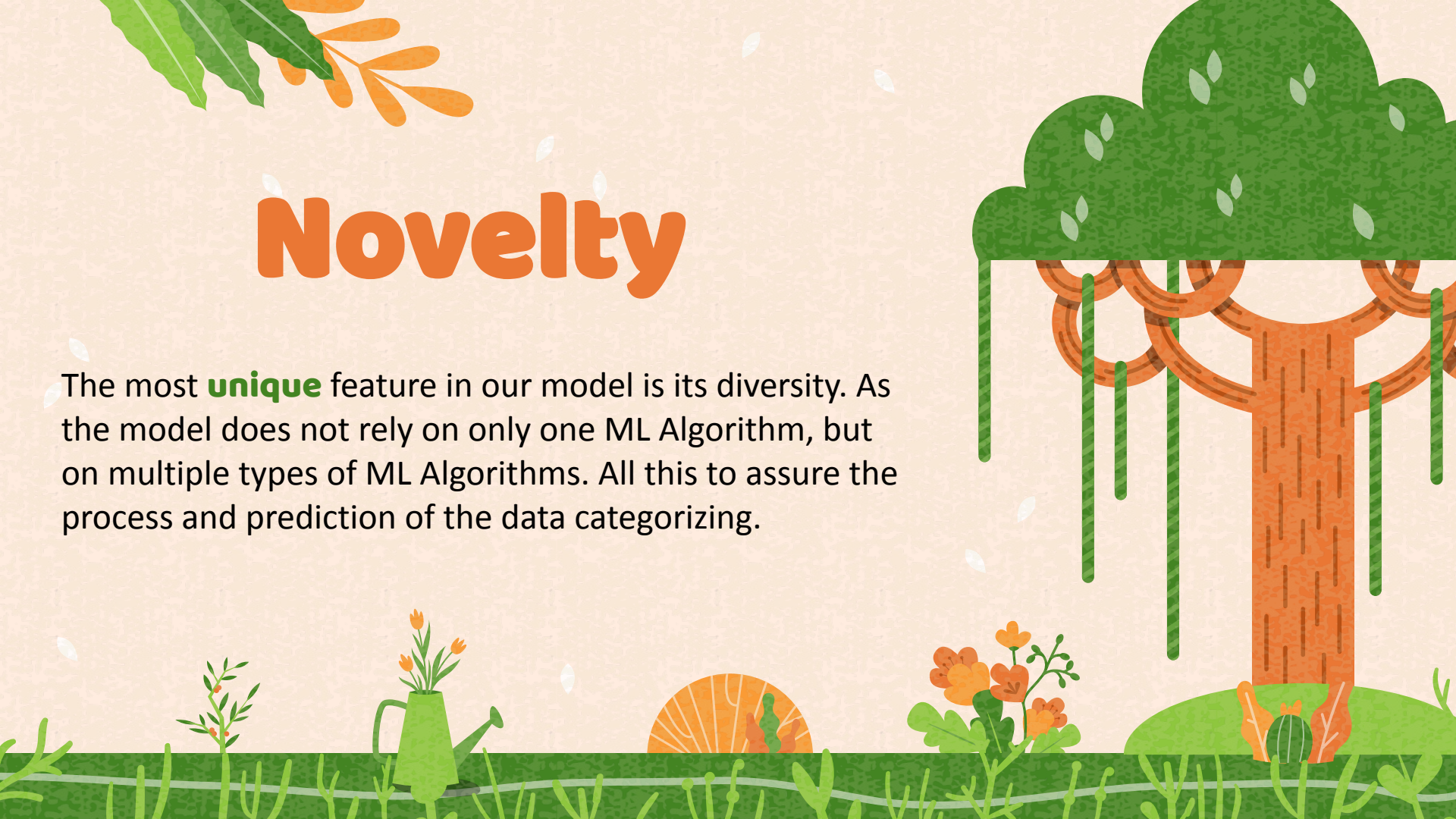


Parameters in the Dataset

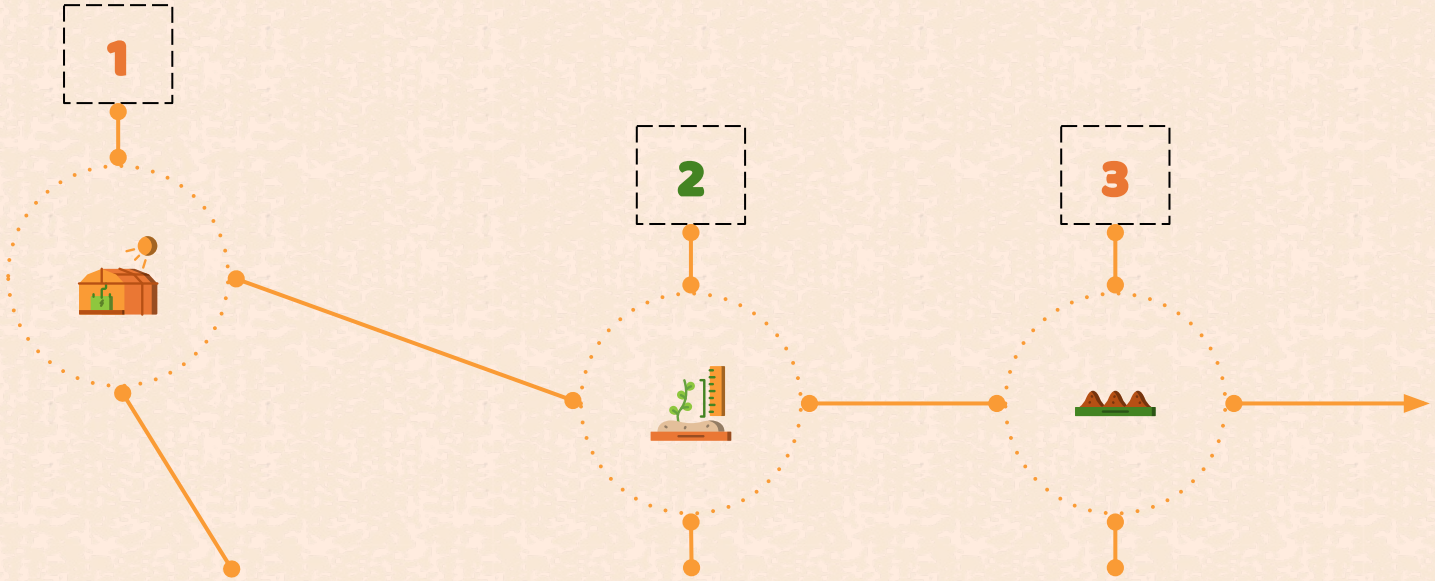
N	Ratio of Nitrogen content in soil
P	Ratio of Phosphorus content in soil
K	Ratio of Potassium content in soil
temperature	temperature in degree Celsius
humidity	Relative humidity in %
ph	Ph value of the soil
rainfall	Rainfall in mm

Novelty

The most **unique** feature in our model is its diversity. As the model does not rely on only one ML Algorithm, but on multiple types of ML Algorithms. All this to assure the process and prediction of the data categorizing.



Model WORKFLOW



Model WORKFLOW

4

Training the
ML Models

5

Comparing the
Accuracies

6

Making
Prediction

7

Deployment
(Future Work)

ML Models Used in the Project

1
DECISION TREE

Predicts the value of a target variable by learning simple decision rules inferred from the data features

2
RANDOM FOREST

In random forests each tree in the ensemble is built from a sample drawn with replacement from the training set.

3
SVM

Set of supervised learning methods used for classification, regression and outliers detection.

4
XGBOOST

Belongs to a family of boosting algorithms and uses the gradient boosting (GBM) framework at its core

5
LOGISTIC REGRESSION

Based on a given set of independent variables, it is used to estimate discrete value (0 or 1, yes/no, true/false)

6
GAUSSIAN NAIVE BAYES

Makes predictions about unknown classes using the Bayes theory of probability.

Evaluation Parameters

1
RECALL

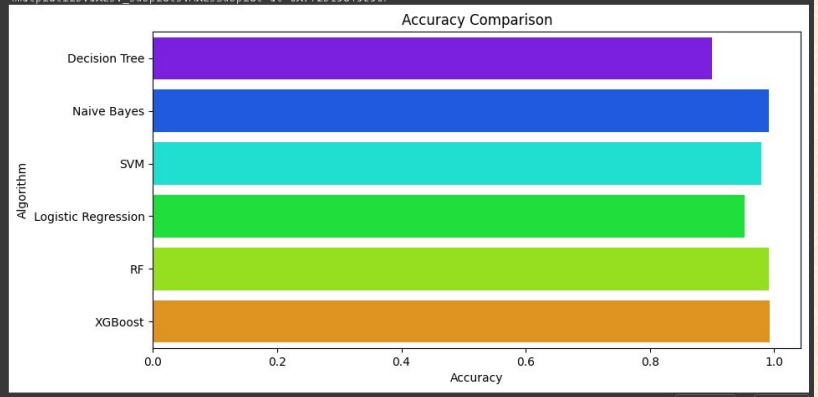
2
PRECISION

3
F1 SCORE

4
SUPPORT

RESULT

<matplotlib.axes._subplots.AxesSubplot at 0x7f2b15645c50>



+ Code + Text

```
[ ]  accuracy_models = dict(zip(model, acc))
     for k, v in accuracy_models.items():
         print (k, '-->', v)
```

```
Decision Tree --> 0.9
Naive Bayes --> 0.990090909090091
SVM --> 0.9795454545454545
Logistic Regression --> 0.9522727272727273
RF --> 0.990090909090091
XGBoost --> 0.9931818181818182
```

Making a Prediction

```
data = np.array([[104,18, 30, 23.603016, 60.3, 6.7, 140.91]])
prediction = RF.predict(data)
print(prediction)
```

```
['coffee']
```

```
data = np.array([[83, 45, 60, 28, 70.3, 7.0, 150.9]])
prediction = NaiveBayes.predict(data)
print(prediction)
```

```
['jute']
```

PREDICTION RESULT

Conclusion

The Suggested System would provide farmers advice on the best crop to produce on their property and make money from it in order to increase production, stimulate the economy, and, most importantly, help farmers increase their income.

Machine learning (ML) has already begun to play an important role in making agriculture more efficient and effective. Precision ag relies on the gathering, processing, and analysis of data for more efficient agricultural production. On the modern farm, you can collect data with the use of advanced technology.

There is no doubt that equipment based on ML has brought the farming system to a new level of efficiency. This technology has increased crop productivity and enhanced tracking, harvesting, processing, and marketing in real-time.


THANK YOU