Soil Testing

Training data - 70% , Testing data - 30%

For Classification :-

Target - Recommended Crop
Best Model - SVM
Parameters -

- kernel = polynomial
- degree of polynomial (degree) = 2
- regularization parameter (C) = 5

Accuracy on testing data - 29 % or (0.29)
Precision - 0.22
Recall - 0.29
F1 score - 0.23
Positively predicted - 43 out of 150

Target - Recommended Fertilizer
Best Model - Gradient Boosting Classifier
Parameters -

- n_estimators = 200
- learning_rate = 0.025
- max_depth = 1

Accuracy on testing data - 0.48
Precision - 0.49
Recall - 0.48
F1 score - 0.43
Positively predicted - 72 out of 150

For Regression :-

Target - Predicted Yield
Best Model - LightGBM Regressor
Parameters -

- n_estimators = 300
- learning_rate = 0.05
- min_data_in_leaf = 50
- Max_depth = 5
- lambda_l1 = 10

Mean squared error (between predicted and actual values) - 1.074
R2_score - 0.0002

Target - Quantity of fertilizer
Best Model - Random Forest Regressor
Parameters -

- n_estimators = 200
- min_samples_split=2
- max_depth = 2

Mean squared error (between predicted and actual values) - 58.77
R2_score - -0.03