



ARIA

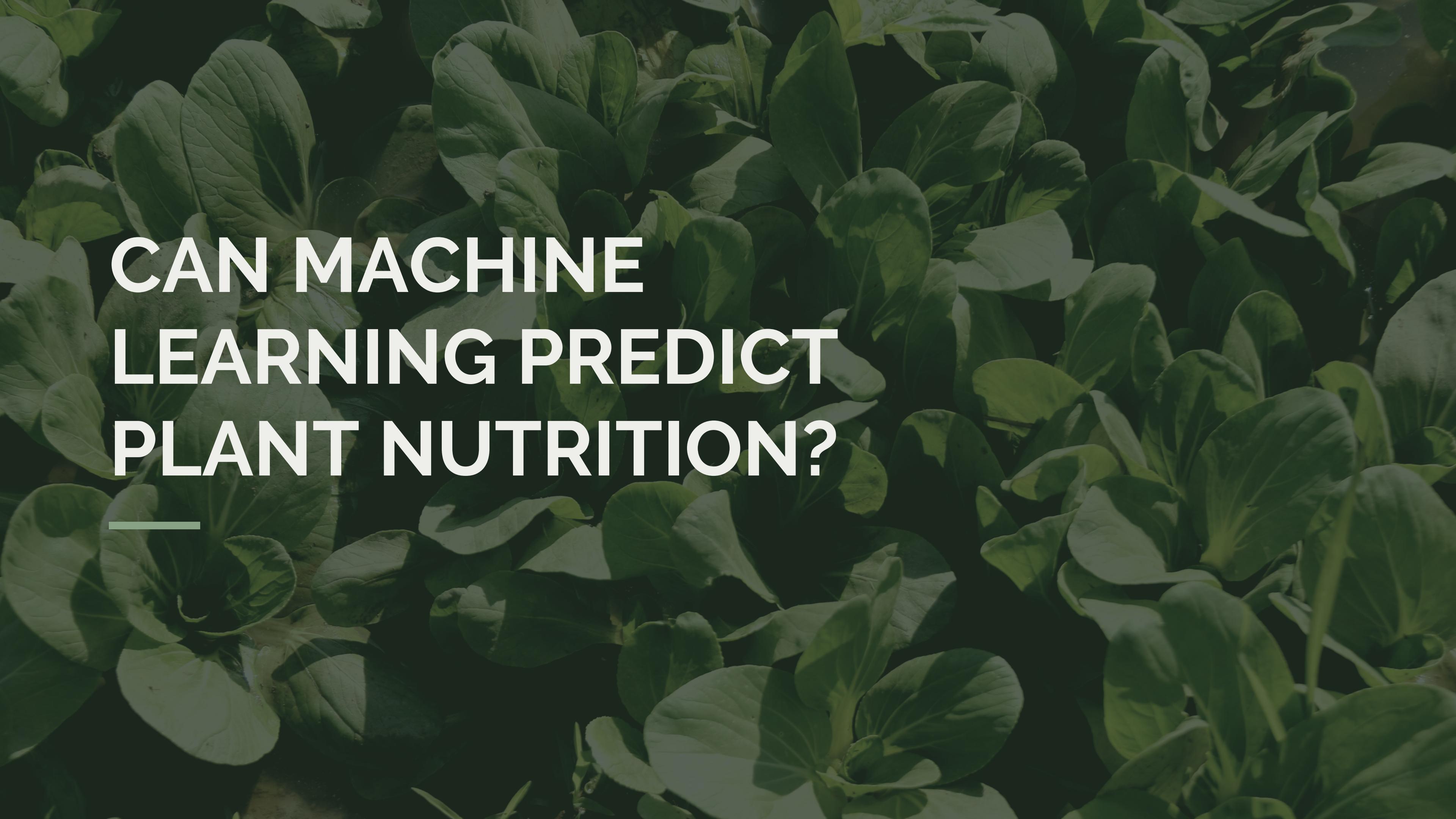


Hacktiv8 | Pratama Prihandana

PLANT NUTRITION

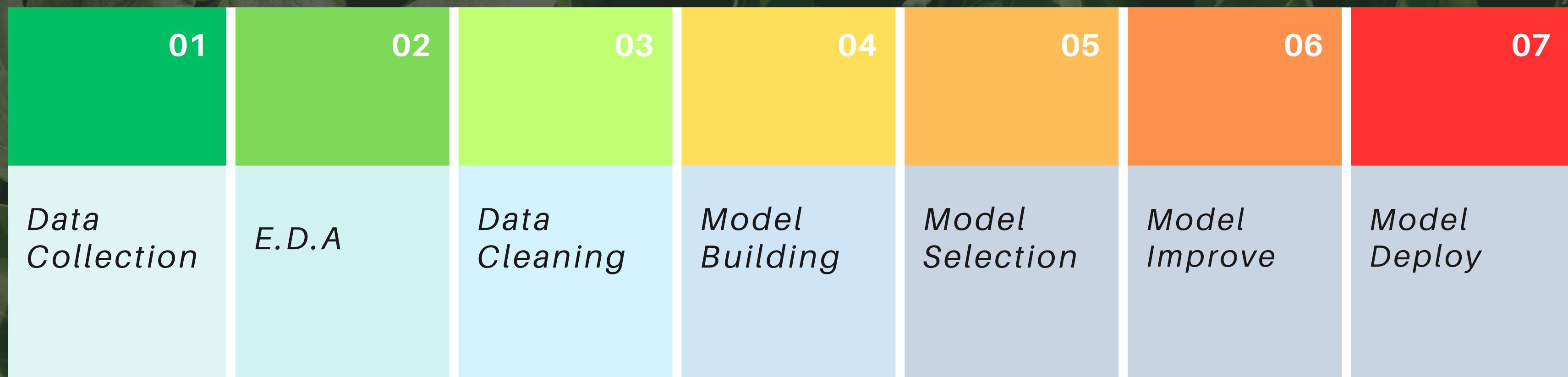
Prediction Using Machine Learning





CAN MACHINE LEARNING PREDICT PLANT NUTRITION?

WORK STEP



DATA OVERVIEW

V1 TO V8

variable to predict plant
nutrition

SAMPLE TYPE

2 different labs sample
obtained

TARGET

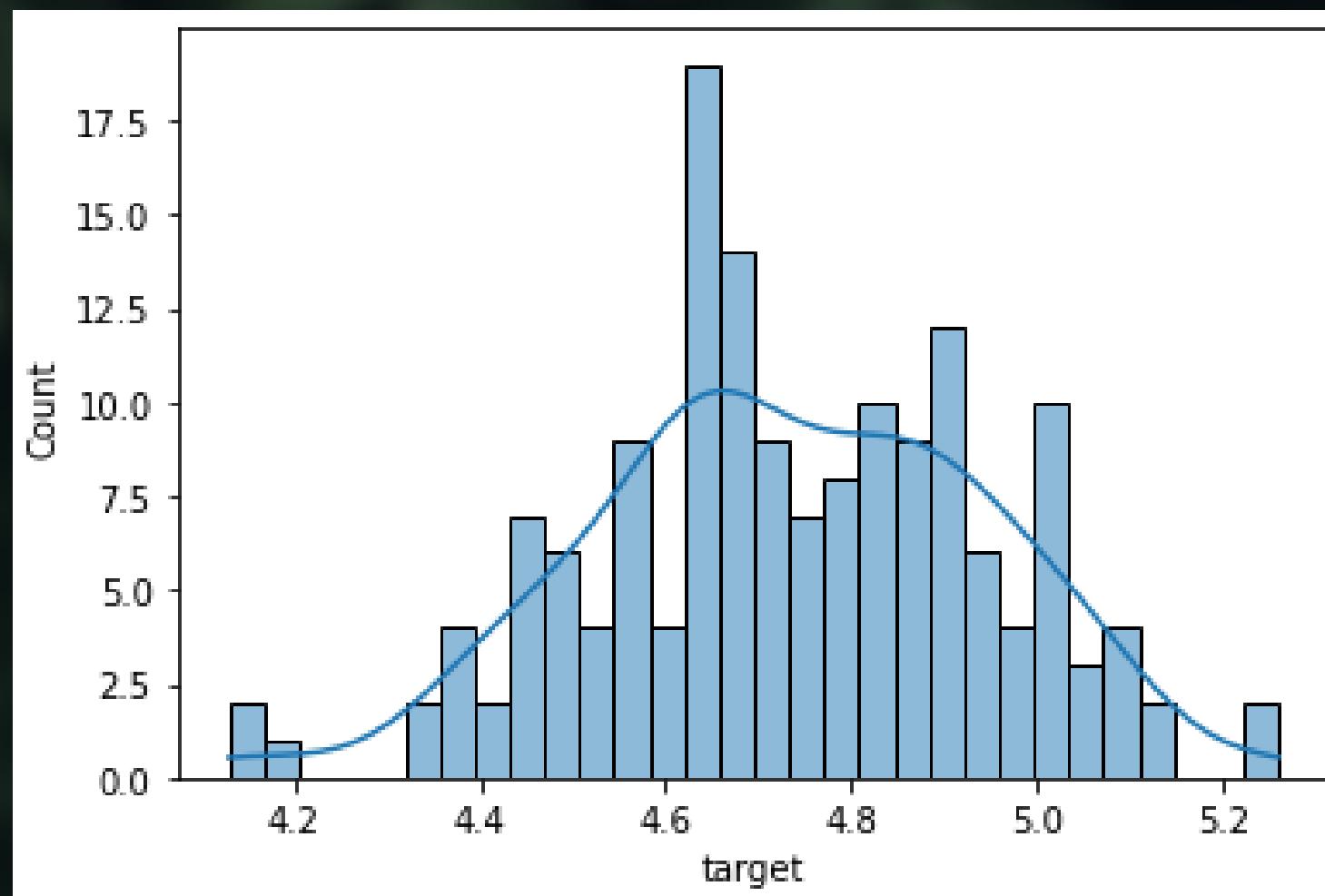
information to predict
plant nutrition

DATASET

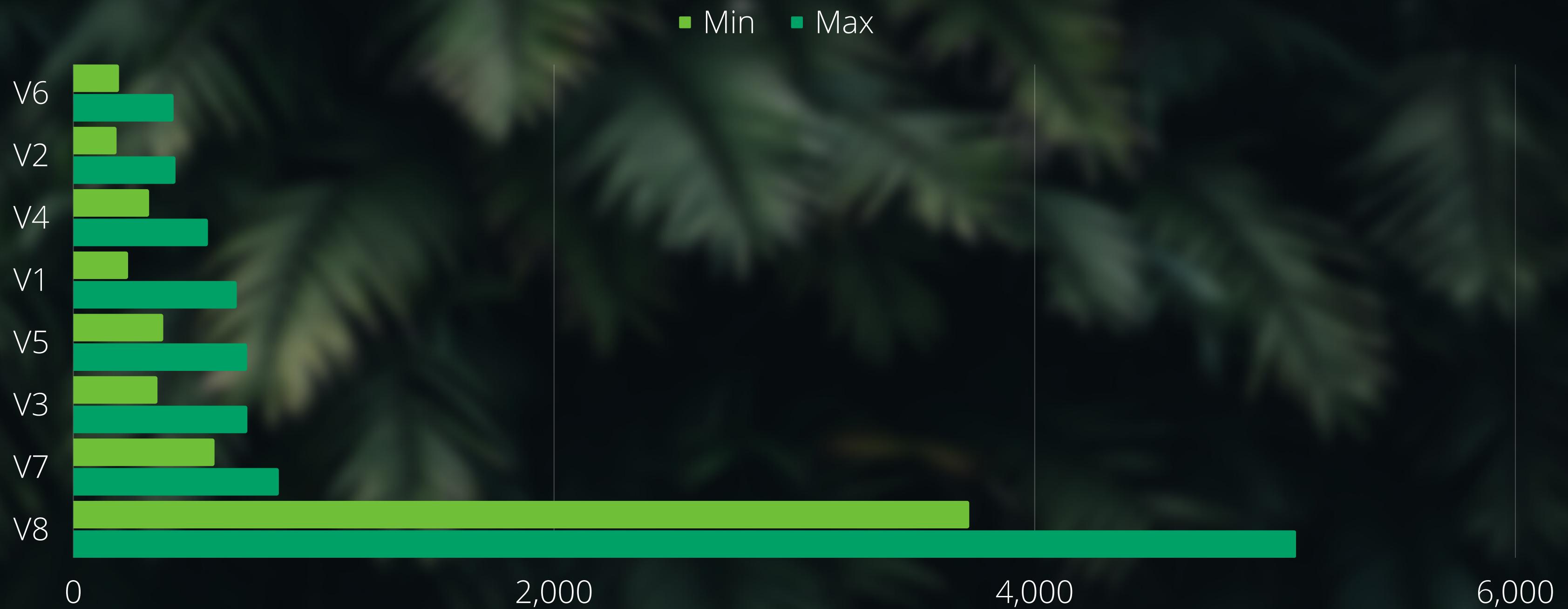
	target	v1	v2	v3	v4	v5	v6	v7	v8	sample_type
0	4.63	260.60	199.00	391.33	371.73	466.80	273.13	742.07	4047.73	lab 1
1	5.00	263.20	194.60	393.67	348.53	401.80	220.07	712.00	4673.47	lab 1
2	4.91	247.27	205.80	375.47	354.87	419.00	222.13	677.20	4386.80	lab 1
3	4.77	257.94	191.83	368.72	334.67	417.22	195.94	678.56	4588.78	lab 1
4	4.89	258.20	195.73	356.67	333.33	394.60	196.00	677.13	4867.07	lab 1
5	4.88	268.72	193.00	364.94	345.89	405.44	210.06	650.67	4493.94	lab 1
6	4.55	255.87	182.13	359.47	326.80	389.47	191.87	632.27	4386.73	lab 1
7	4.74	248.93	203.93	365.20	332.93	390.93	202.20	664.00	4646.20	lab 1
8	4.72	269.00	191.47	381.20	353.20	403.53	217.80	714.53	4751.47	lab 1
9	4.72	268.27	178.80	370.00	342.47	384.53	204.73	690.33	4255.20	lab 1



Sample Lab



Target
Distribution



Variable
Range



Machine Learning Model

- **Linear Regression**
- **Random Forest Regressor**
- **Decision Tree Regressor**
- **KNeighbors Regressor**
- **Gradient Boosting Regressor**
- **Ridge Regression**
- **Ensemble Regressor**
- **AdaBoost Regressor**
- **Polynomial Random Forest**

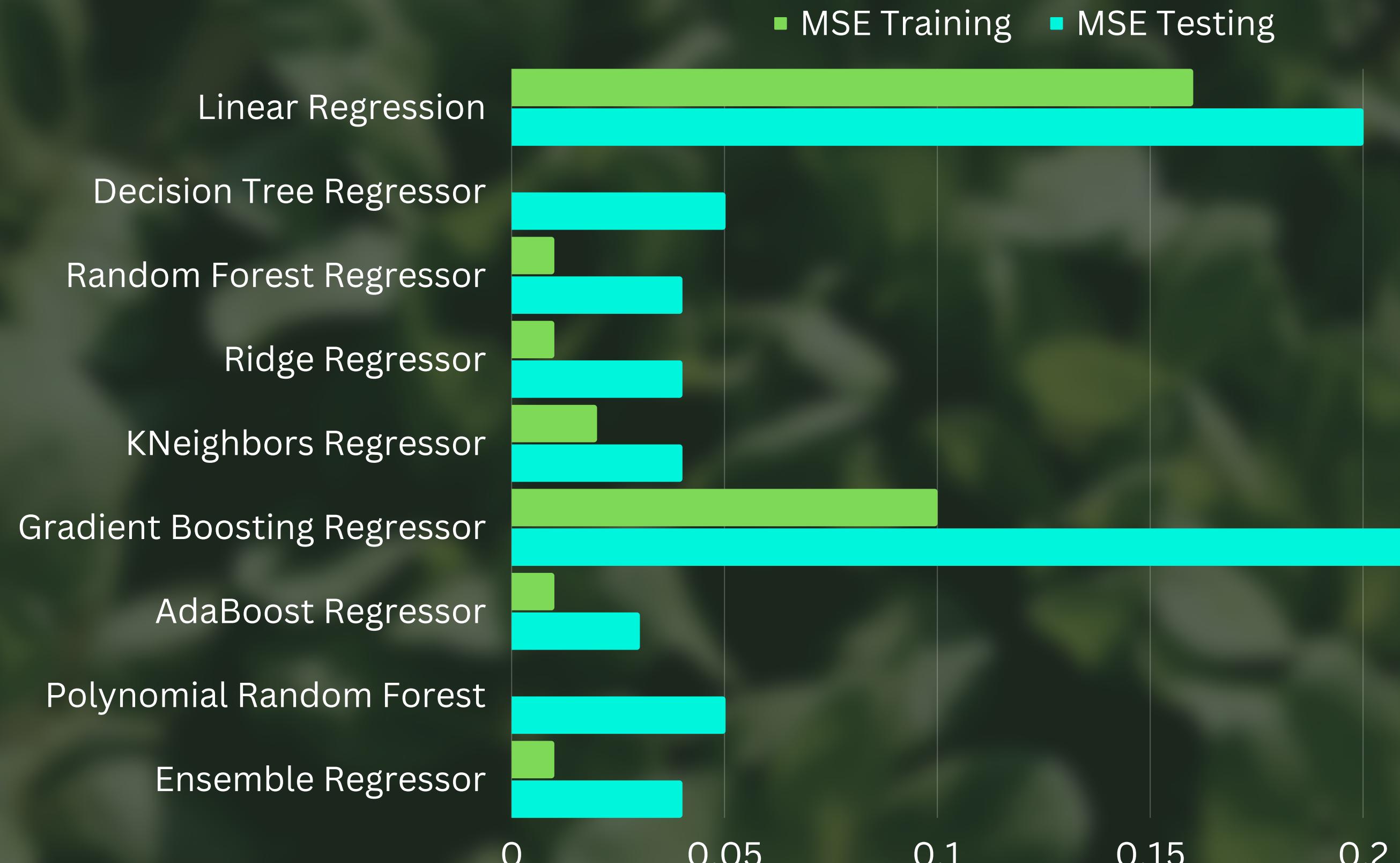
Model Metrics

R2 Score



Model Metrics

MSE



Model Metrics

MAE



Model Improvement



Pruning

Simplify the model by removing branches of tree

Reducing Test Size

Lowering test size into 10%

Nesting

Model inside model

Model Improvement



Pruning

**Random
Forest
Regressor**

**First
AdaBoost**

**Second
AdaBoost**

Put Random
Forest inside
first AdaBoost

Put first
AdaBoost
inside
second
Adaboost



Model Improvement

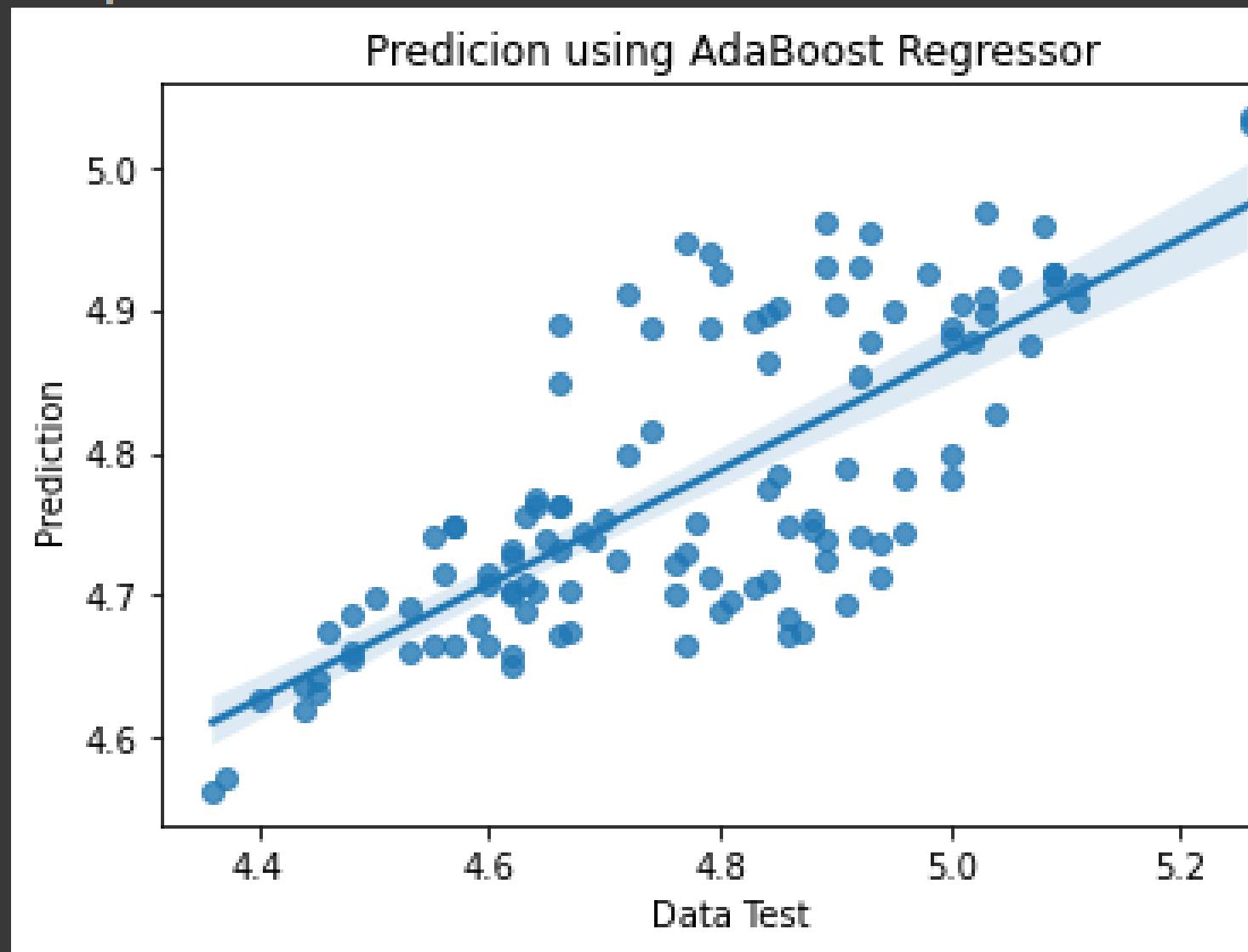


Training result :

MSE: 0.02

MAE: 0.12

R-squared: 0.52

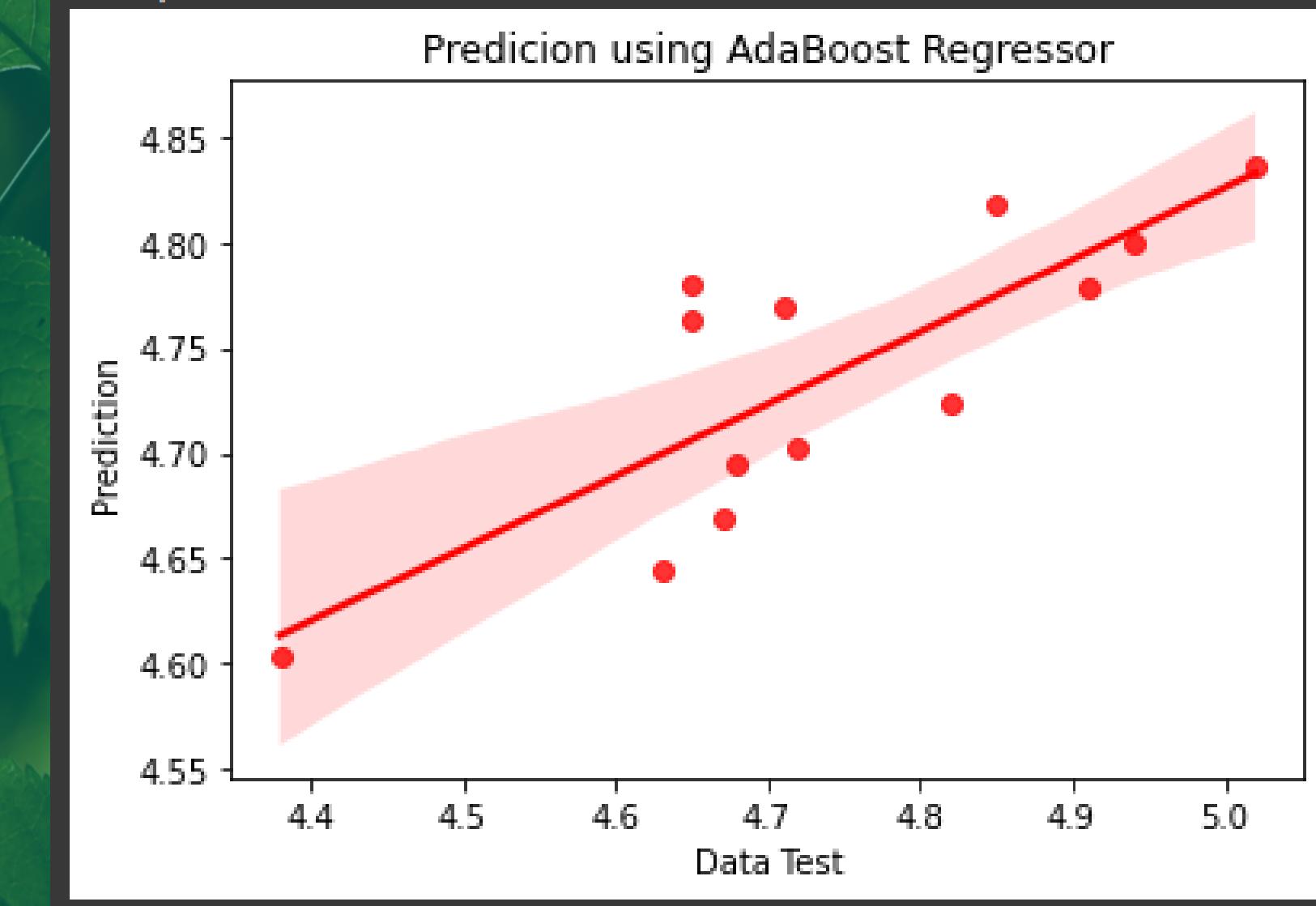


testing result :

MSE: 0.01

MAE: 0.09

R-squared: 0.51





Thank You



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