**Model Optimization and Tuning Phase**

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| Date | 12 July 2024 |
| Team ID | SWTID1720077079 |
| Project Title | Wild Blueberry Yield Prediction |
| Maximum Marks | 10 Marks |

### Hyperparameter Tuning Documentation (6 Marks):

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| **Model** | **Tuned Hyperparameters** | **Optimal Values** |
| XGBoost - Grid Search Optimized |  | 'colsample\_bytree': 0.8, 'learning\_rate': 0.2, 'max\_depth': 3, 'min\_child\_weight': 3, 'n\_estimators': 300, 'subsample': 0.8 |
| XGBoost - Random Search Optimized |  | 'subsample': 1.0, 'n\_estimators': 411, 'min\_child\_weight': 1, 'max\_depth': 3, 'learning\_rate': 0.2, 'colsample\_bytree': 1.0 |

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### Performance Metrics Comparison Report (2 Marks):

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| **Model** | **Baseline Metric** | **Optimized Metric** |
| XGBoost - Grid Search Optimized |  |  |
| XGBoost - Random Search Optimized |  |  |

### Final Model Selection Justification (2 Marks):

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| **Final Model** | **Reasoning** |
| XGBoost - Random Search Optimized | It was chosen because of:   1. Low Mean Absolute Error 2. Low Root Mean Squared Error 3. High R2 Score   on testing set. |