**Machine Learning Intern Task - Hyperspectral Imaging**

**Project Overview**

This project involves processing **hyperspectral imaging data** to predict **mycotoxin (DON) concentration** in corn samples. The pipeline includes **data preprocessing, dimensionality reduction (PCA), machine learning model training (Random Forest & Neural Network), and model evaluation.**

**Repository Structure**

📂 ML-Intern-Task

├── 📄 ML\_Intern\_Task.ipynb # Jupyter Notebook with complete code

├── 📄 REPORT.md # Summary of methodology and findings

├── 📄 README.md # Setup instructions & project details

**Installation & Setup**

**1. Clone the Repository**

git clone https://github.com/your-username/ML-Intern-Task.git

cd ML-Intern-Task

**2. Install Dependencies**

pip install -r requirements.txt

If requirements.txt is not provided, install manually:

pip install pandas numpy matplotlib seaborn scikit-learn tensorflow

**3. Run the Jupyter Notebook**

jupyter notebook ML\_Intern\_Task.ipynb

**How to Use**

* Run all cells in ML\_Intern\_Task.ipynb to preprocess data, train models, and evaluate performance.
* Check REPORT.md for insights into the results.

**Key Features**

✅ **Min-Max Scaling for normalization**  
✅ **PCA for feature reduction**  
✅ **Random Forest & Neural Network for regression**  
✅ **GridSearchCV for hyperparameter tuning**  
✅ **Evaluation metrics: MAE, RMSE, R² Score**

**Developed as part of the ML Intern Task for Hyperspectral Imaging Analysis.**