

## **CNN Model for Predicting Vomitoxin Levels**

This project uses a 1D Convolutional Neural Network (CNN) to predict vomitoxin levels in agricultural data.

### **Setup**

Clone the repository and navigate to the project directory:

```
git clone https://github.com/your-repo/cnn-vomitoxin-predictor.git
```

```
cd cnn-vomitoxin-predictor
```

Create a virtual environment and activate it:

```
python -m venv env
```

```
source env/bin/activate # For Linux/Mac
```

```
env\Scripts\activate # For Windows
```

Install the required libraries:

```
pip install -r requirements.txt
```

### **Execute Notebook**

Open the Jupyter Notebook and run all cells:

```
jupyter notebook cnn_model.ipynb
```

The notebook will:

1. Load and preprocess the data.
2. Build and train a CNN model.
3. Evaluate the model's performance using metrics like MAE, RMSE, and  $R^2$ .

### **Model Saving and Evaluation**

The trained model is saved as `cnn_model.pkl`. The notebook also outputs performance metrics:

Test MAE: <value>

Test RMSE: <value>

Test  $R^2$ : <value>

### **Results**

The model's performance on the test set demonstrates its ability to predict vomitoxin levels with strong accuracy.