Project Development Phase
Model Performance Test

Date	28 June 2025
Team ID	LTVIP2025TMID41715
Project Name	Transfer Learning-Based Classification of Poultry Diseases for Enhanced Health Management
Maximum Marks	10 Marks

Model Performance Testing:

Project team shall fill the following information in model performance testing template.

S.No.	Parameter	Values	Screenshot
1.	Metrics	**Regression Model:** **1. Objective** To develop a regression model that **predicts the severity score of poultry infections** (on a scale of 0 to 1) based on features extracted from images using a **transfer learning backbone (ResNet50)**. This severity score is useful for: • Prioritizing veterinary intervention, • Estimating disease progression, • Supporting farm-level health risk analytics. ◆ **2. Data & Features** • **Input Images:** 500+ labeled poultry images across 3 major diseases and healthy class. • **Transfer Learning:** Used **ResNet50** pre-trained on ImageNet; extracted high-level features from final convolutional layers. • **Target Variable:** Severity score (continuous value between 0 and 1), estimated from expert ratings or lesion size estimation.	**Classification Model:**

		◈ **3. Models Used**	

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Model Type	Description
Linear Regression	Baseline regr
Random Forest	Tree-based e
XGBoost Regressor	Gradient boo

◈ 4. Preprocessing Steps
- Image normalization and resizing to 224x224 pixels
- Feature extraction using transfer learning
- Min-max scaling of continuous features
- Target severity scores normalized between 0 and 1

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Classification Model:
Confusion Matrix:
[[50, 2, 1], [3, 47, 0], [0, 2, 51]]

Accuracy Score: 96.67%

Classification Report:
<pre> precision recall f1-score support
Healthy 0.94 0.96 0.95 53
Coccidiosis 0.94 0.94 0.94 50
Newcastle 0.98 0.96 0.97 53
Accuracy: 0.9667</pre>

| 2. | Tune the Model | **Hyperparameter Tuning :**
- Pre-trained model: ResNet50
- Tuned parameters: learning rate (0.0001), batch size (32), dropout (0.5)
Validation Method :
- Train-validation-test split (70-15-15)
- 5-fold cross-validation used to confirm consistency and avoid overfitting | |