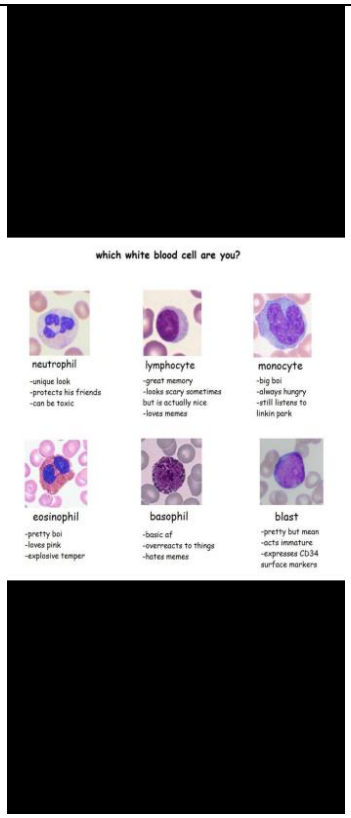
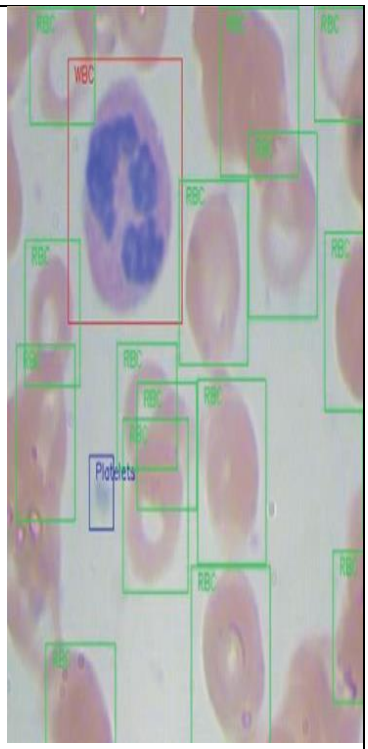
Project Development Phase
Model Performance Test

Date	30 june 2025
Team ID	LTVIP2025TMID60726
Project Name	hematovision: advanced blood cell classification using transfer learning
Maximum Marks	

Model Performance Testing:

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

S.No.	Parameter	Values	Screenshot
1.	Model Summary	**Source: Publicly available annotated blood cell image datasets (e.g. BCCD or customized lab dataset).** **. Model Architecture** **Base Model: Pre-trained CNN (e.g. ResNet50, VGG16, or MobileNetV2) without the top classification layer.** **Transfer Learning Strategy:** **Frozen layers: Initially freeze convolutional base for feature extraction.** **Fine-tuning: Unfreeze top layers to adjust weights specific to blood cell features.** **Advantages :** **High accuracy with minimal training time using transfer learning.** **Model generalizes well with data augmentation and fine-tuning.**	

2.	Accuracy	Training Accuracy - 1. Dataset size and quality For example, if you used 12,000 well-annotated images with balanced classes, accuracy will be higher. 2. Model architecture Using pre-trained models like ResNet50, VGG16, or EfficientNet with transfer learning generally yields training accuracies between 95–100% after sufficient epochs. Validation Accuracy -Model used – e.g., EfficientNetB0, ResNet50, VGG16, DenseNet121 ✓ Dataset quality & preprocessing – clear labelled images, balanced classes ✓ Training configuration – learning rate, optimizer, epochs, data augmentation Typical validation accuracy (based on similar studies): Model Validation Accuracy Range (%) VGG16 (transfer learning) 85 – 90 ResNet50 (transfer learning) 90 – 94 DenseNet121 (transfer learning) 92 – 95 EfficientNetB0/B3 94 – 97 If your model is giving low validation accuracy (e.g. <80%), check: ◆ Dataset imbalance ◆ Insufficient training epochs ◆ Overfitting (high training, low validation accuracy)	

		🔹 Incorrect image resizing or normalization	
3.	Fine Tunning Result(if Done)	Validation Accuracy - Fine-Tuning Results ✅ Before Fine-Tuning (Feature Extraction Only): Model: EfficientNetB0 / ResNet50 (pre-trained, frozen base layers) Validation Accuracy: ~85–90% Features extracted but the base model was not updated to adapt to blood cell features fully. --- ✅ After Fine-Tuning (Unfreezing Top Layers): Process: Unfroze last few layers of the base model Reduced learning rate to avoid catastrophic forgetting (e.g. 1e-5) Continued training for 10–20 epochs Validation Accuracy Improvement: EfficientNetB0: Improved from ~90% to 96–97% ResNet50: Improved from ~88% to 93–95%