Project Design Phase
Solution Architecture

Date	28 june 2025
Team ID	LTVIP2025TMID60119
Project Name	Hematovision
Maximum Marks	4 Marks

Solution Architecture:

The HematoVision system is designed using a modular architecture that combines AI model deployment, web-based interfacing, and image preprocessing for efficient blood cell classification.

1. User Interface (Frontend)
    - Built with: HTML, CSS, Bootstrap (via Flask templates)
    - Function: Users upload microscope images for classification via a simple web page
2. Backend Server (Flask Framework)
    - Handles:
        - Image upload
        - Preprocessing (resizing, normalization)
        - Model loading and prediction
        - Display of results (cell type + confidence score)
3. Deep Learning Model (AI Component)
    - Model Type: EfficientNet (or ResNet), fine-tuned via Transfer Learning
    - Input: 224x224 blood smear image
    - Output: Predicted cell type and confidence (e.g., RBC, WBC, Platelet)
4. Data Handling
    - Training Data: Preprocessed microscope images of blood cells
    - Live Prediction: Accepts images uploaded by users
    - Model Storage: Trained .h5 model file loaded into Flask app at runtime
5. Hosting & Deployment
    - Local: Flask server run on local machine for testing
    - Cloud-ready: Can be deployed to Render, Hugging Face Spaces, or PythonAnywhere
    - Future Scope: Convert to mobile-compatible model via TensorFlow Lite for on-device use

6. Output Display

- Predicted class (e.g., Neutrophil)
- Confidence score (e.g., 94.2%)
- Option to view original image alongside result

Solution Architecture Diagram: