# Project Members:

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Project Title:  
**Bone Marrow Cell Classification Analysis for Diagnostic Purposes**

Project Brief:  
The goal of this project is to develop an automated bone marrow cell classification system using Deep Learning and image analysis techniques to accurately identify and classify different cell types in bone marrow aspirates. This will aid hematologists in diagnosing blood disorders (e.g., leukemias, myelodysplastic syndromes) more efficiently and with higher precision.

**Key Features of the System**:

**Automated Cell Detection** – Identifies and segments individual cells in bone marrow smears.  
**Multi-Class Classification** – Distinguishes between different cell types (e.g., myeloblasts, erythroblasts, lymphocytes, megakaryocytes).  
**Abnormality Detection** – Flags rare or malignant cells (e.g., leukemic blasts, dysplastic changes).  
**High Accuracy & Reproducibility** – Reduces inter-observer variability in diagnosis.  
**User-Friendly Interface** – Integrates with hospital systems (LIS/PACS) and allows pathologist review.  
**Scalability** – Works with whole-slide images (WSI) and large datasets.  
**Explainability** – Provides confidence scores and visual explanations (e.g., Grad-CAM) for AI decisions.

# Tools and Resources:

1. **Programming Languages**: Python, Flutter
2. **Libraries and Frameworks**: TensorFlow, scikit-learn, numpy, OpenCV
3. **Development Tools**: Visual Studio Code, Jupyter Notebook, Google Colab
4. **APIs**: FastAPI
5. **Version Control**: GitHub for collaborative development
6. **Platforms**: Windows

By employing these tools and resources, the project aims to deliver a user-friendly and efficient platform for file management, accessibility, and content analysis.