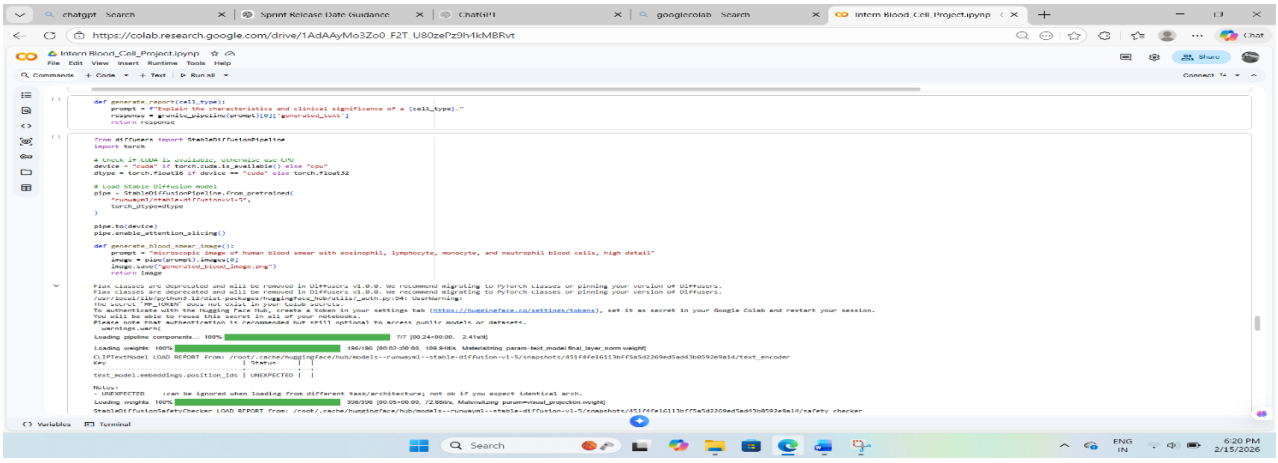
Project Demonstration Phase

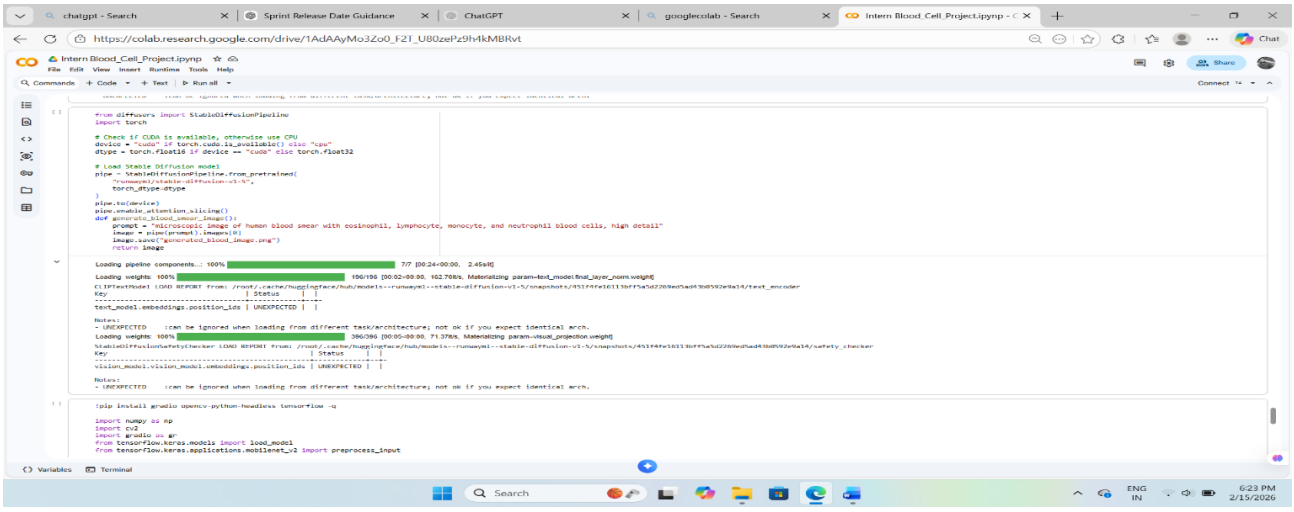
Stable Diffusion Model Initialization and Device

This section of the code initializes the Stable Diffusion v1.5 model using the Hugging Face Diffusers library. It first checks whether CUDA (GPU) is available and selects either GPU or CPU for execution to optimize performance. The appropriate data type (float16 for GPU or float32 for CPU) is selected to reduce memory usage. The pipeline is then loaded and moved to the selected device, enabling efficient image generation.



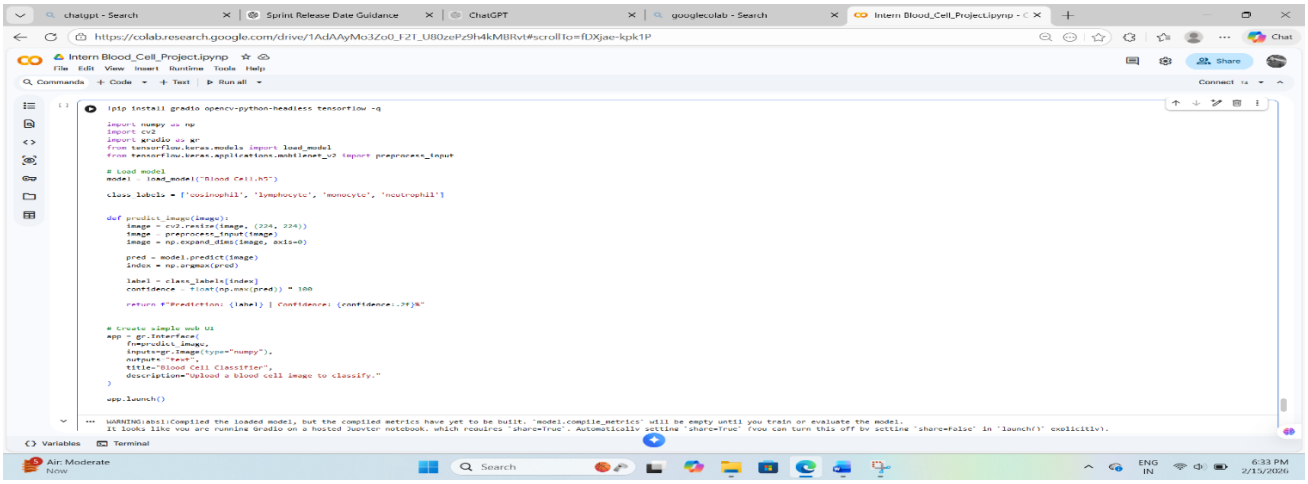
Blood Smear Image Generation Using Text-to-Image Prompt

This part of the code defines the function generate_blood_smear_image() to create synthetic microscopic blood smear images. A detailed medical prompt describing eosinophils, lymphocytes, monocytes, and neutrophils is provided to the model. The Stable Diffusion pipeline generates a high-resolution image based on this prompt and saves it as generated_blood_image.png. The console output below confirms successful loading of model weights and components.



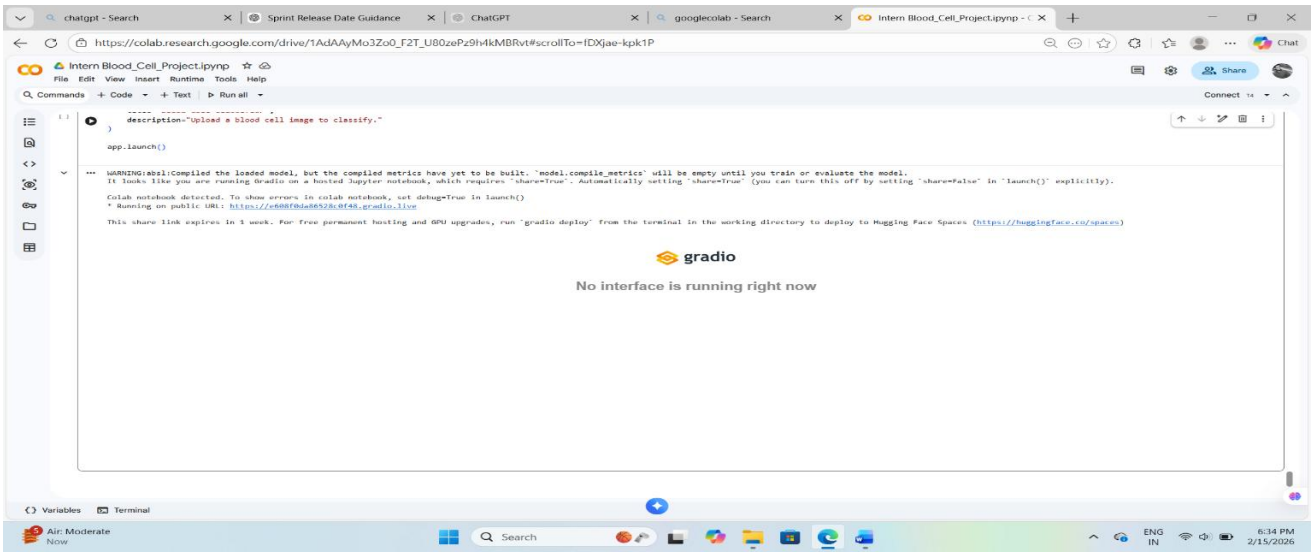
Gradio-Based Deployment of Blood Cell Classification Model

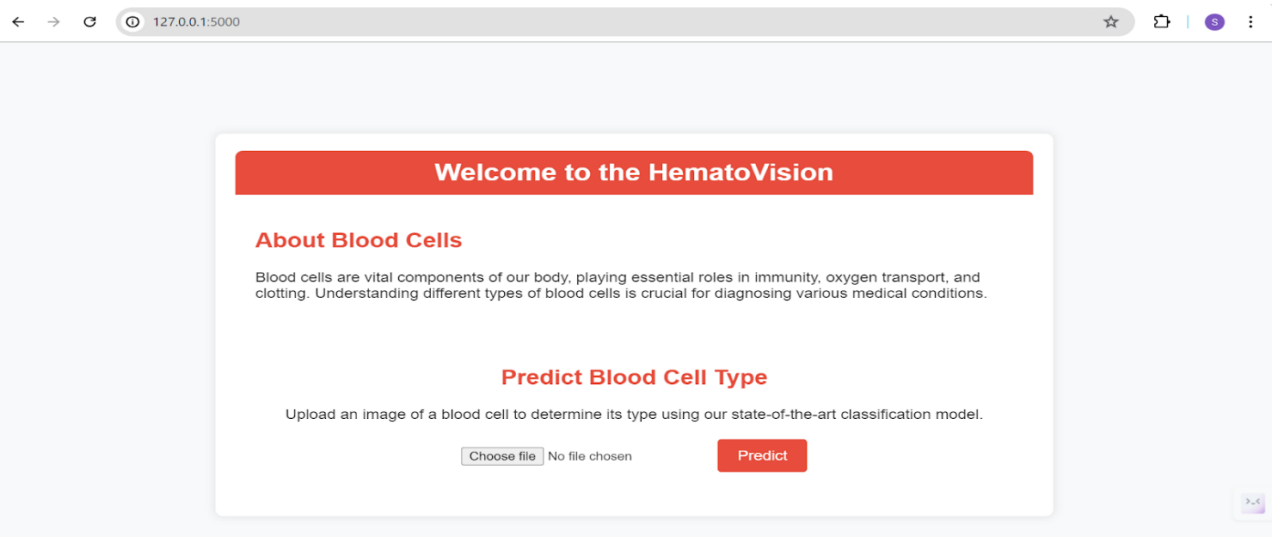
This section of the code deploys the trained Blood Cell classification model using the Gradio library. The saved model Blood Cell.h5 is loaded, and class labels such as eosinophil, lymphocyte, monocyte, and neutrophil are defined. The predict_image() function preprocesses the uploaded image by resizing it to 224×224 pixels, applying MobileNetV2 preprocessing, and expanding dimensions before making predictions. The predicted class is determined using argmax, and the confidence score is calculated and displayed as output.



Launching the Web Interface for Model Deployment

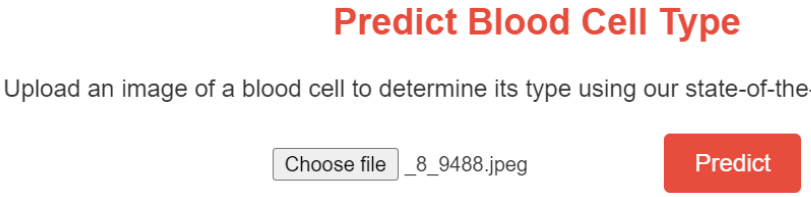
This part shows the execution of app.launch(), which starts the Gradio web interface for user interaction. Once launched, the application generates a public shareable link, allowing users to upload blood cell images and receive classification results in real time. The console output confirms successful deployment and provides the temporary URL for accessing the application online.

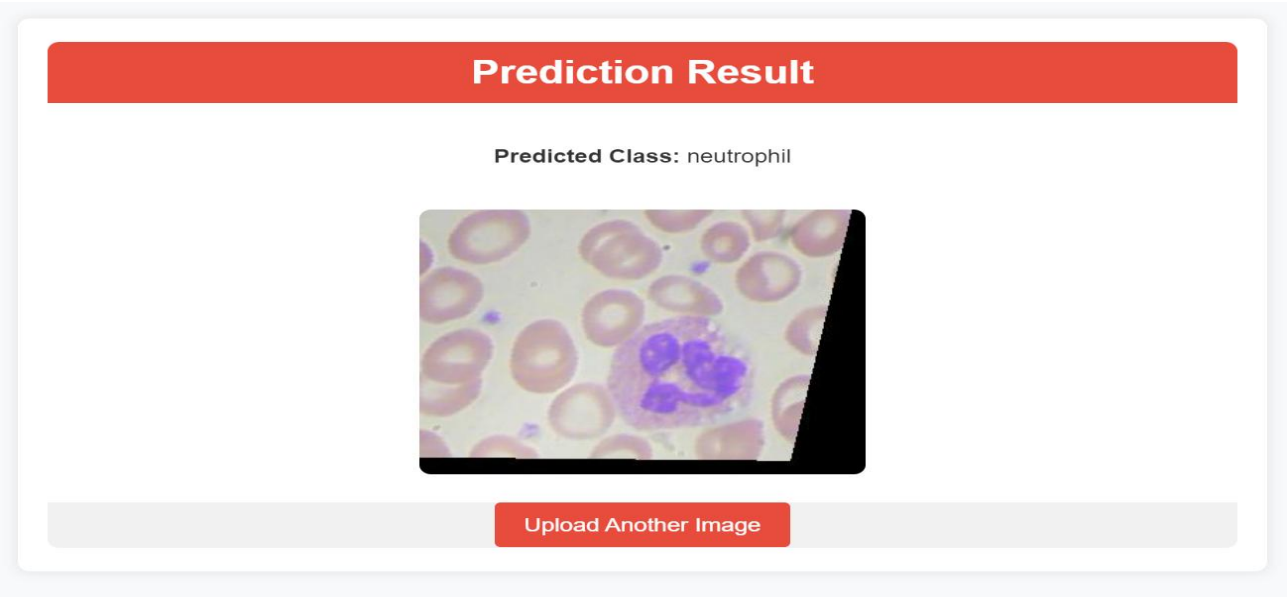




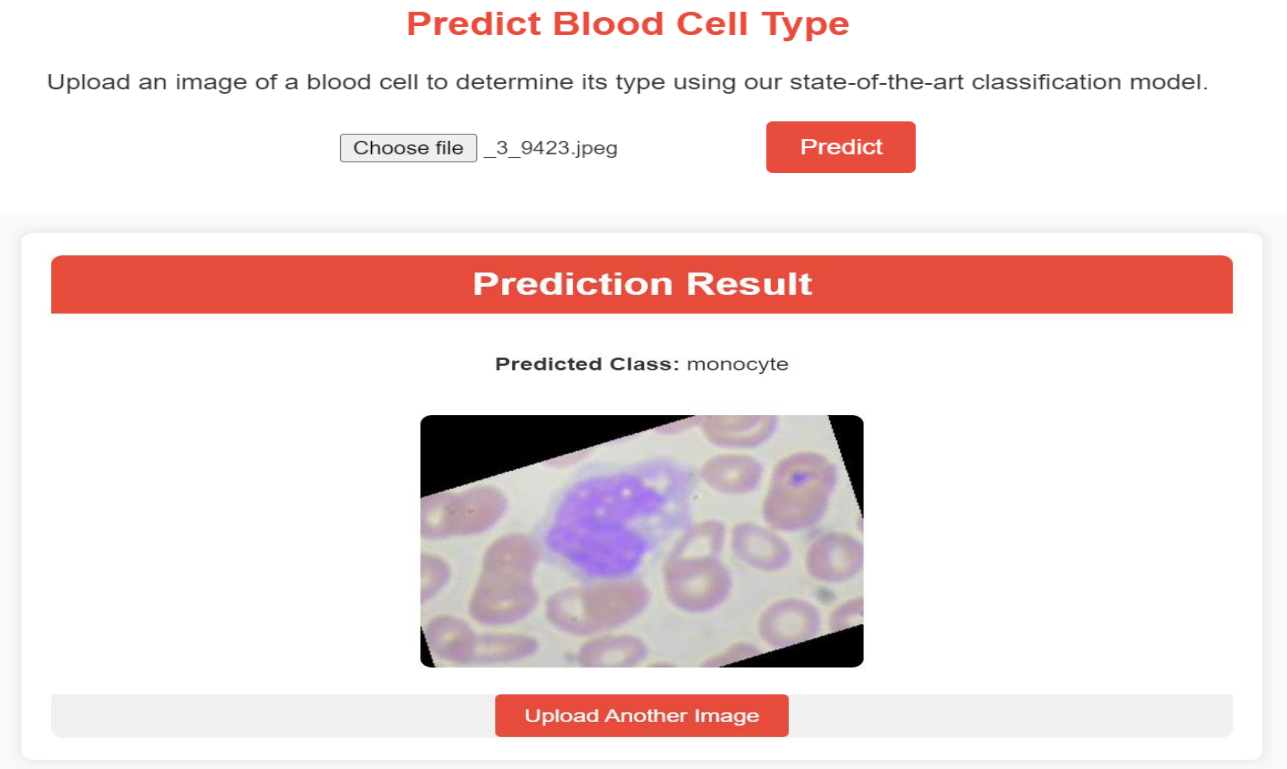
By clicking on choose file it will ask us to upload the image , then by clicking on the predict button it will take us to the result.html.

Activity 1: Test For Class-1 – Neutrophil

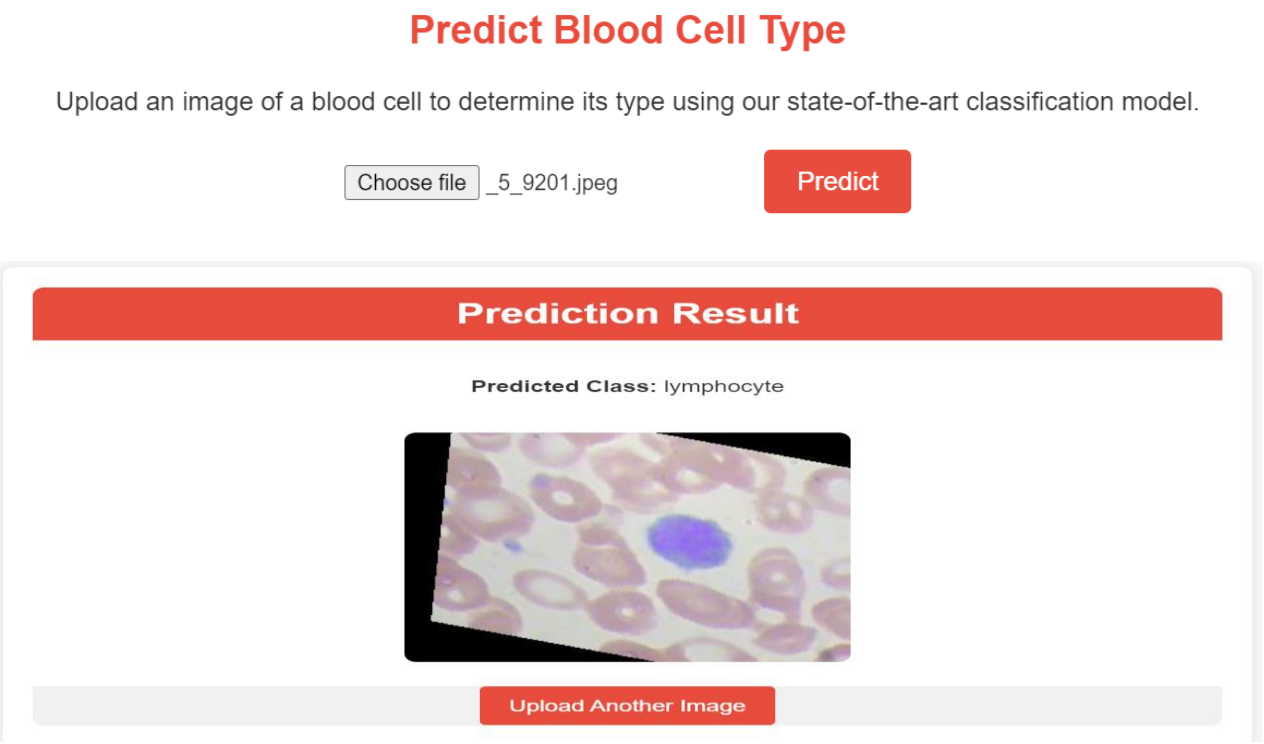




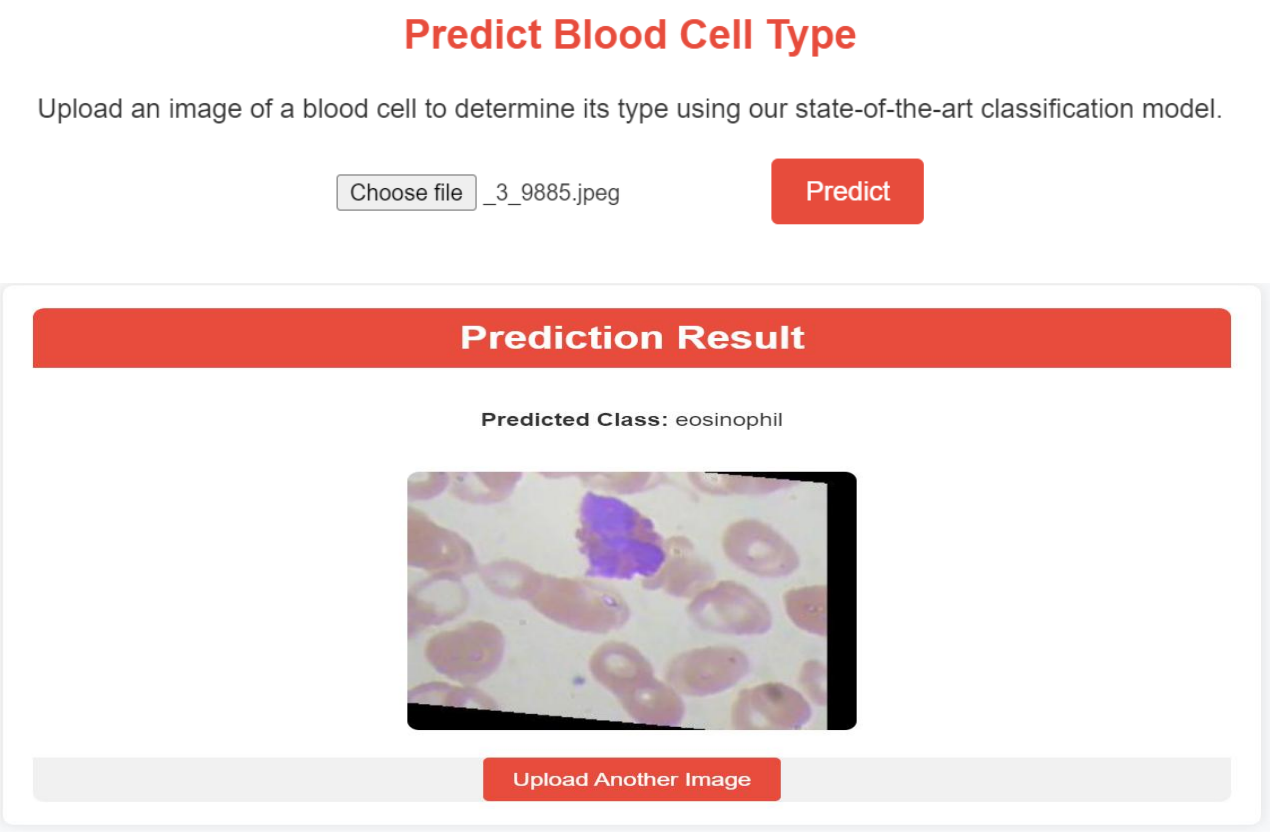
Activity 2: Test For Class-2 – Monocyte



Activity 3: Test For Class-3 – Lymphocyte



Activity 4: Test For Class-4 – Eosinophil



Demo Link:

https://drive.google.com/file/d/1oXSLu4lW-SQOzftMFpjtagMg_7hxfgKW/view?usp=drivesdk

Google Colab Link :

https://colab.research.google.com/drive/1nnHWn4UKBKx6oxfna4zrmP5ovKtj4S5b