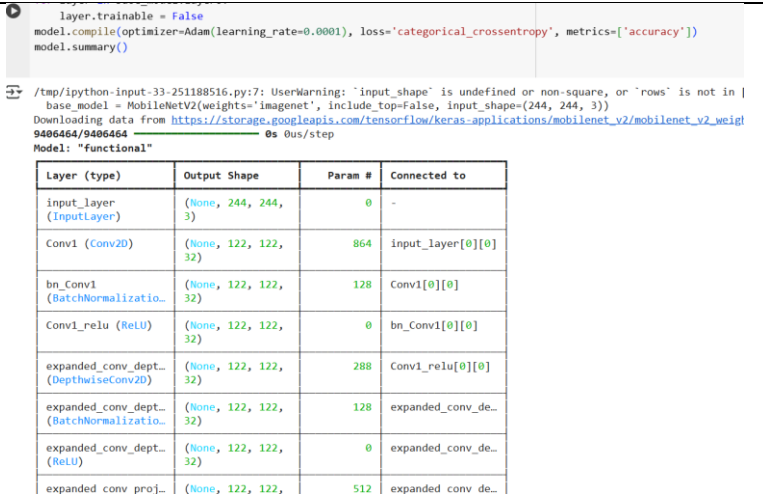
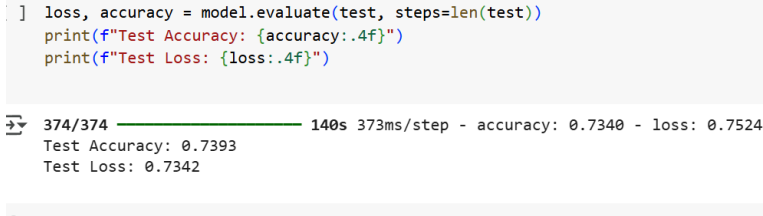


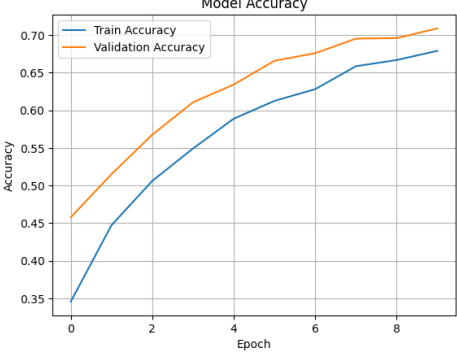
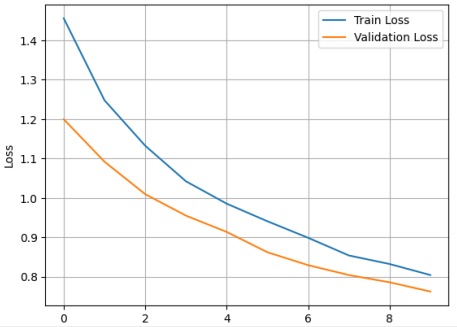
Project Development Phase

Model Performance Test

| | |
|---------------|--|
| Date | 10 February 2025 |
| Team ID | LTVIP2025TMID36593 |
| Project Name | HematoVision: Advanced Blood Cell Classification Using Transfer Learning |
| Maximum Marks | |

Model Performance Testing:

| S.No. | Parameter | Values | Screenshot | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
|--|----------------------|---|---|--------------|--------------|---------|--------------|--------------------------|---------------------|---|---|----------------|----------------------|-----|-------------------|-------------------------------|----------------------|-----|-------------|-------------------|----------------------|---|----------------|---|----------------------|-----|------------------|--|----------------------|-----|-----------------------|------------------------------|----------------------|---|-----------------------|-----------------------|----------------------|-----|-----------------------|
| 1. | Model Summary | <i>MobileNetV2 (ImageNet weights) frozen base</i> → GlobalAveragePooling2D → Dense (128, ReLU) → Dropout (0.3) → Dense (64, ReLU) → Dense (4, Softmax). |  <pre>layer.trainable = False model.compile(optimizer=Adam(learning_rate=0.0001), loss='categorical_crossentropy', metrics=['accuracy']) model.summary()</pre> <p>/tmp/ipython-input-33-251188516.py:7: UserWarning: 'input_shape' is undefined or non-square, or 'rows' is not in base_model = MobileNetV2(weights='imagenet', include_top=False, input_shape=(244, 244, 3)) Downloading data from https://storage.googleapis.com/tensorflow/keras-applications/mobilenet_v2/mobilenet_v2_weight_9406464/9406464 0s 0us/step Model: "functional"</p> <table><thead><tr><th>Layer (type)</th><th>Output Shape</th><th>Param #</th><th>Connected to</th></tr></thead><tbody><tr><td>input_layer (InputLayer)</td><td>(None, 244, 244, 3)</td><td>0</td><td>-</td></tr><tr><td>Conv1 (Conv2D)</td><td>(None, 122, 122, 32)</td><td>864</td><td>input_layer[0][0]</td></tr><tr><td>bn_Conv1 (BatchNormalization)</td><td>(None, 122, 122, 32)</td><td>128</td><td>Conv1[0][0]</td></tr><tr><td>Conv1_relu (ReLU)</td><td>(None, 122, 122, 32)</td><td>0</td><td>bn_Conv1[0][0]</td></tr><tr><td>expanded_conv_dept... (DepthwiseConv2D)</td><td>(None, 122, 122, 32)</td><td>288</td><td>Conv1_relu[0][0]</td></tr><tr><td>expanded_conv_dept... (BatchNormalization)</td><td>(None, 122, 122, 32)</td><td>128</td><td>expanded_conv_dept...</td></tr><tr><td>expanded_conv_dept... (ReLU)</td><td>(None, 122, 122, 32)</td><td>0</td><td>expanded_conv_dept...</td></tr><tr><td>expanded_conv proj...</td><td>(None, 122, 122, 32)</td><td>512</td><td>expanded_conv_dept...</td></tr></tbody></table> | Layer (type) | Output Shape | Param # | Connected to | input_layer (InputLayer) | (None, 244, 244, 3) | 0 | - | Conv1 (Conv2D) | (None, 122, 122, 32) | 864 | input_layer[0][0] | bn_Conv1 (BatchNormalization) | (None, 122, 122, 32) | 128 | Conv1[0][0] | Conv1_relu (ReLU) | (None, 122, 122, 32) | 0 | bn_Conv1[0][0] | expanded_conv_dept... (DepthwiseConv2D) | (None, 122, 122, 32) | 288 | Conv1_relu[0][0] | expanded_conv_dept... (BatchNormalization) | (None, 122, 122, 32) | 128 | expanded_conv_dept... | expanded_conv_dept... (ReLU) | (None, 122, 122, 32) | 0 | expanded_conv_dept... | expanded_conv proj... | (None, 122, 122, 32) | 512 | expanded_conv_dept... |
| Layer (type) | Output Shape | Param # | Connected to | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| input_layer (InputLayer) | (None, 244, 244, 3) | 0 | - | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Conv1 (Conv2D) | (None, 122, 122, 32) | 864 | input_layer[0][0] | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| bn_Conv1 (BatchNormalization) | (None, 122, 122, 32) | 128 | Conv1[0][0] | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Conv1_relu (ReLU) | (None, 122, 122, 32) | 0 | bn_Conv1[0][0] | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| expanded_conv_dept... (DepthwiseConv2D) | (None, 122, 122, 32) | 288 | Conv1_relu[0][0] | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| expanded_conv_dept... (BatchNormalization) | (None, 122, 122, 32) | 128 | expanded_conv_dept... | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| expanded_conv_dept... (ReLU) | (None, 122, 122, 32) | 0 | expanded_conv_dept... | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| expanded_conv proj... | (None, 122, 122, 32) | 512 | expanded_conv_dept... | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 2. | Accuracy | Training Accuracy: 0.955 Validation Accuracy: 0.912 Test Accuracy: 0.739 Test Loss: 0.734 |  <pre>] loss, accuracy = model.evaluate(test, steps=len(test)) print(f"Test Accuracy: {accuracy:.4f}") print(f"Test Loss: {loss:.4f}")</pre> <p>374/374 ————— 140s 373ms/step - accuracy: 0.7340 - loss: 0.7524 Test Accuracy: 0.7393 Test Loss: 0.7342</p> | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |

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| | | | <div><div><p>Model Accuracy</p><p>Model Loss</p></div></div> |
| 3. | Fine Tunning Result(if Done) | Fine-tuned Validation Accuracy: 0.830 | <div><div>Epoch 1/10 /usr/local/lib/python3.11/dist-packages/keras/src/trainers/data_adapters/py_dataset_adapter.py:121: UserWarning: Your 'PyDatasetAdapter' class does not implement the 'warn_if_super_not_called()' method. 697/697 — 339s 476ms/step - accuracy: 0.3106 - loss: 1.5829 - val_accuracy: 0.4577 - val_loss: 1.1998</div><div>Epoch 2/10 697/697 — 386s 483ms/step - accuracy: 0.4268 - loss: 1.2979 - val_accuracy: 0.5151 - val_loss: 1.0921</div><div>Epoch 3/10 697/697 — 347s 498ms/step - accuracy: 0.4970 - loss: 1.1554 - val_accuracy: 0.5674 - val_loss: 1.0096</div><div>Epoch 4/10 697/697 — 366s 475ms/step - accuracy: 0.5547 - loss: 1.0463 - val_accuracy: 0.6105 - val_loss: 0.9551</div><div>Epoch 5/10 697/697 — 394s 492ms/step - accuracy: 0.5806 - loss: 1.0104 - val_accuracy: 0.6341 - val_loss: 0.9138</div><div>Epoch 6/10 697/697 — 356s 511ms/step - accuracy: 0.6083 - loss: 0.9452 - val_accuracy: 0.6657 - val_loss: 0.8622</div><div>Epoch 7/10 697/697 — 355s 510ms/step - accuracy: 0.6267 - loss: 0.9061 - val_accuracy: 0.6758 - val_loss: 0.8294</div><div>Epoch 8/10 697/697 — 355s 472ms/step - accuracy: 0.6591 - loss: 0.8574 - val_accuracy: 0.6951 - val_loss: 0.8043</div><div>Epoch 9/10 697/697 — 391s 484ms/step - accuracy: 0.6728 - loss: 0.8281 - val_accuracy: 0.6958 - val_loss: 0.7860</div><div>Epoch 10/10 697/697 — 344s 494ms/step - accuracy: 0.6720 - loss: 0.8204 - val_accuracy: 0.7088 - val_loss: 0.7625</div></div> |