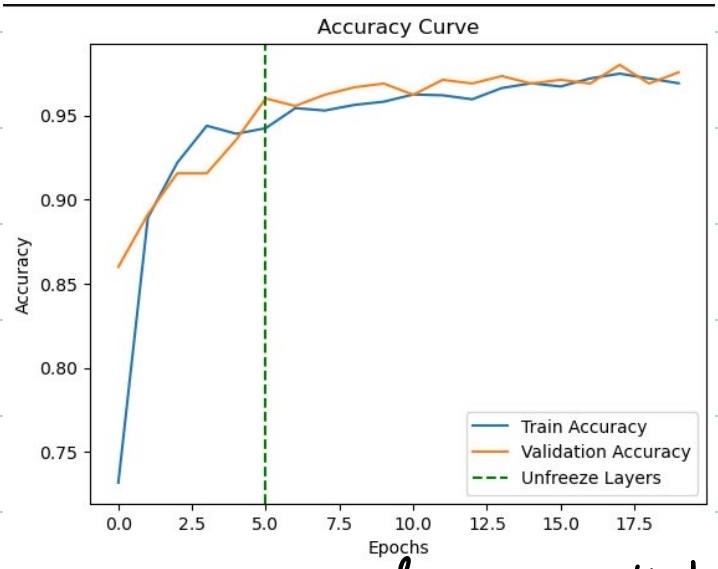
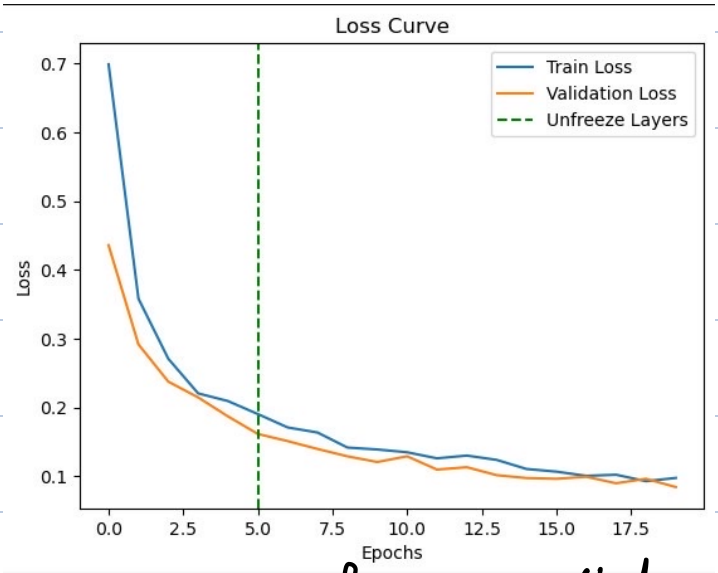
Hw7 Jerry Chen 6648519090

Plot learning and accuracy curves for the training and validation sets. Include comments and/or
annotate the figures to indicate when you adjusted layer freezing and changed the learning rate.



with freezing method

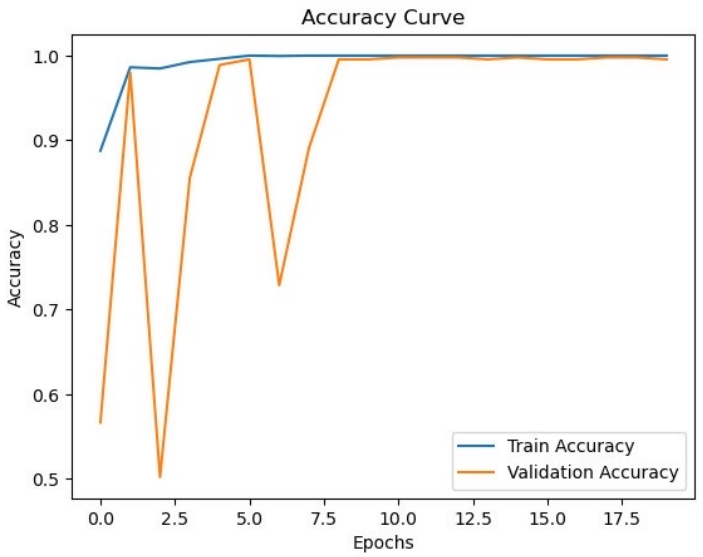


with freezing method

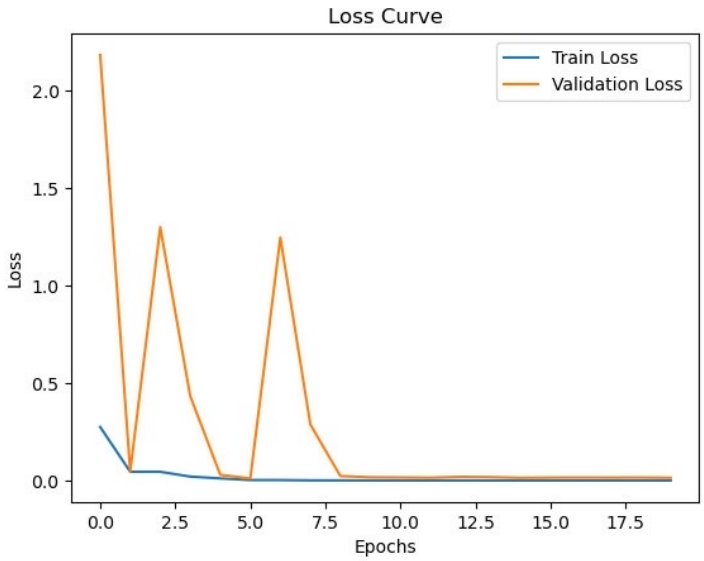
I experimented with different batch size (16 to 64) and learning rate (1e-5 to 1e-3). The best result was achieved with batch size of 64 and learning rate of 1e-3. Larger batch sizes provided more stable gradient updates, and the higher learning rate enabled faster convergence.

For a layer freezing part, without freezing, the validation accuracy exhibited significant fluctuations. This suggests potential instability in learning due to the entire model being trainable from the start. By contrast, with freezing, The traing and validation accuracy show a smooth and consistent improvement as the epoch progress, indicating controlled training with minimal overfitting. After unfreezing

layers, the accuracy further improves.



without freezing method



without freezing method

Analysis:

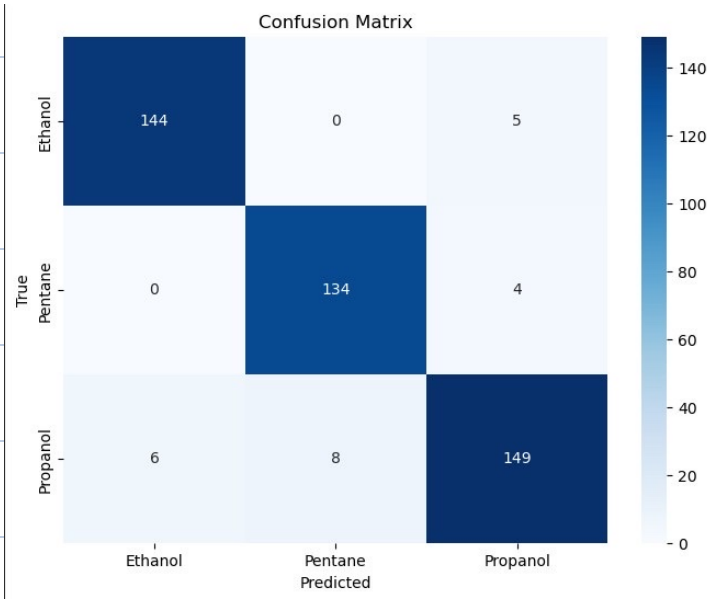
Report the accuracy of the fine-tuned model on the testing set.
Compare the accuracy to the
baseline vanilla pretrained ResNet-34 model.

```
Evaluating: 100%| | 8/8 [00:03<00:00,  2.40it/s]
Baseline Accuracy (Pretrained ResNet-34): 0.4378
Model inside evaluate_model: cuda:0
Evaluating: 100%| | 8/8 [00:03<00:00,  2.43it/s]
Fine-Tuned Model Accuracy: 0.9489
```

Baseline Accuracy: The performance of the pretrained ResNet-34 model on the testing set before fine-tuning, which serves as a reference point (0.4378).

Fine-Tuned Accuracy: The performance of the fine-tuned model on the same testing set (0.9489), showing the improvement achieved through the fine-tuning process.

Confusion Matrix :



Precision - Recall Curve