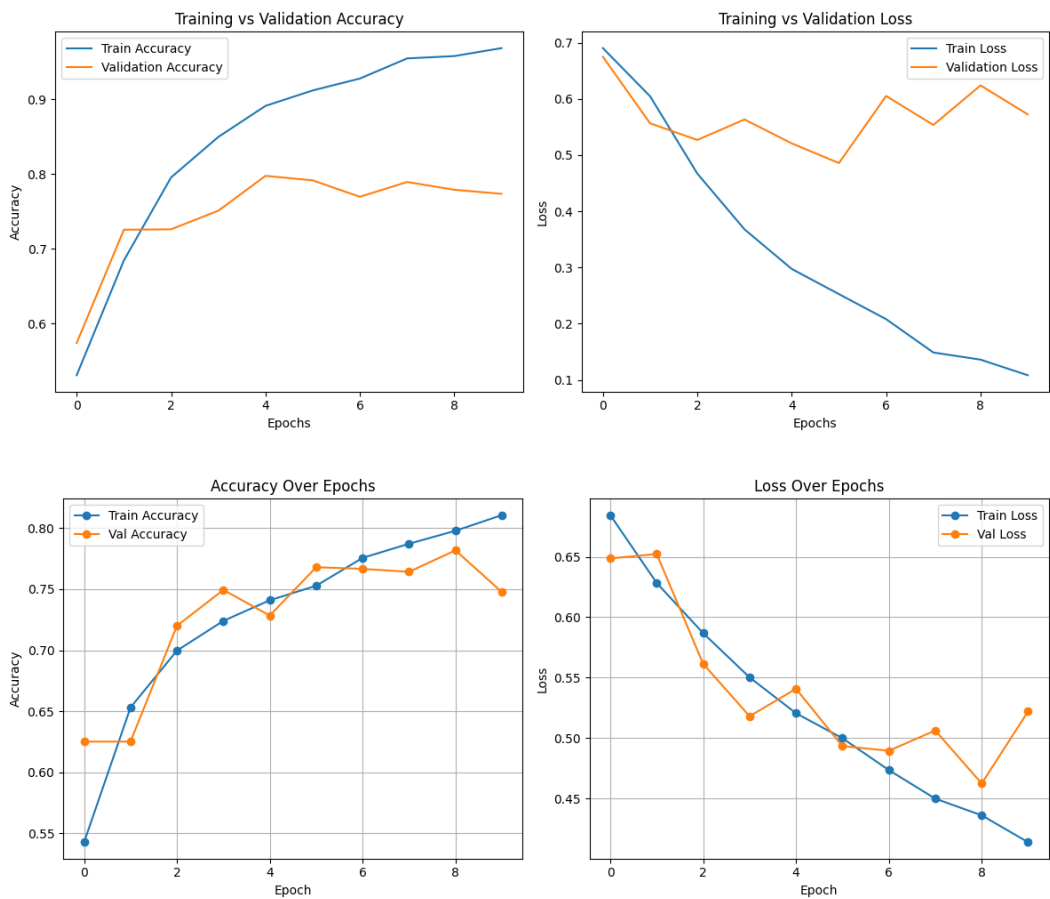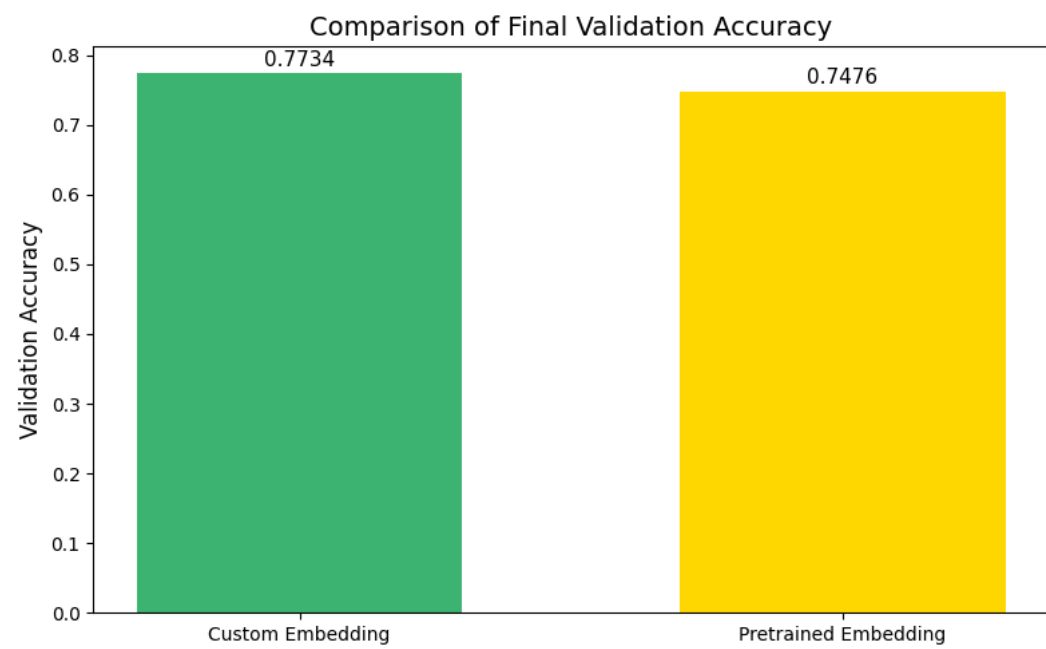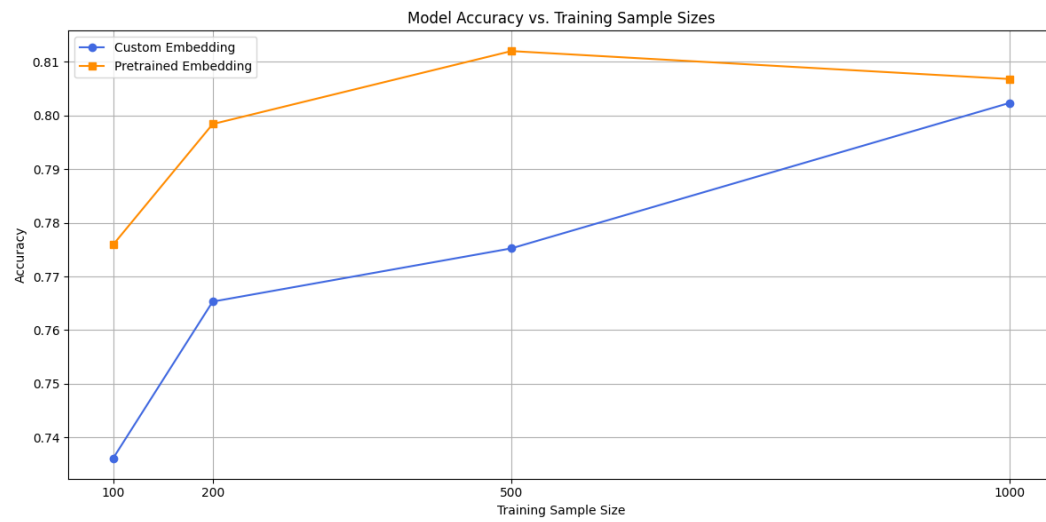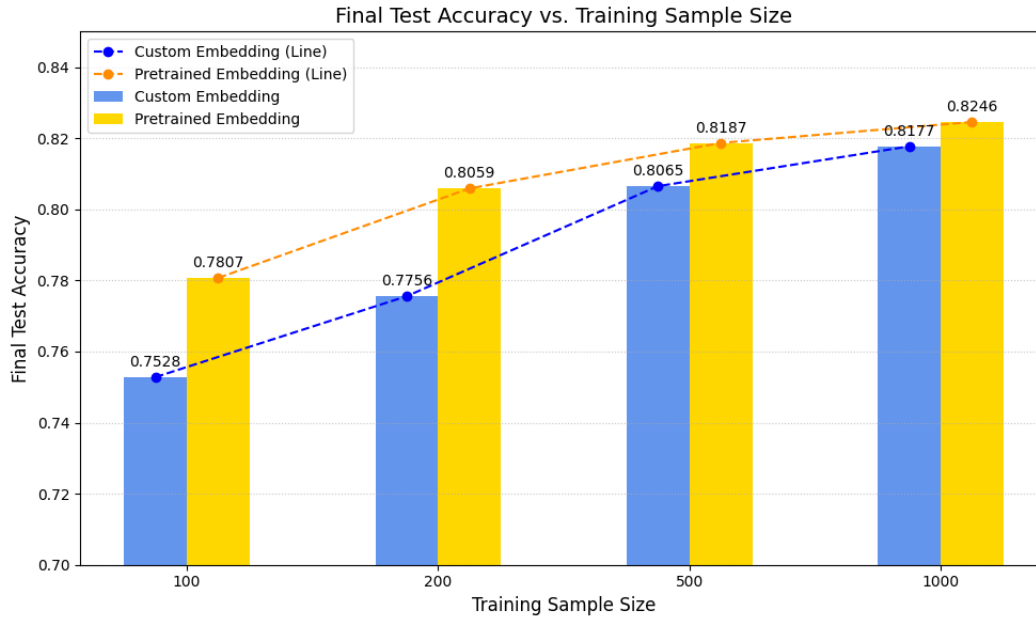# Summary Report: aml_4.ipynb

Introduction

This report explores the application of machine learning models—particularly neural networks like multilayer perceptrons (MLPs)—to classify visual satellite data. The primary objective is to distinguish between tree-covered regions and urban structures like cars by training deep learning models on satellite images. This task demonstrates the use of deep learning in remote sensing and image classification.

Model Accuracy vs. Training Sample Sizes

Comparison of Final Validation Accuracy

Final Test Accuracy vs. Training Sample Size

Methods

The methods involve loading satellite image data from Google Maps, pre-processing the image patches into labeled datasets, and feeding them into MLP models. Two deep learning libraries—TensorFlow and PyTorch—are employed to implement these neural network models. The architectures are trained on extracted features, and their accuracy and loss are tracked over multiple epochs. Comparisons are made between different model configurations and training strategies.

Conclusion

This analysis demonstrates that both TensorFlow and PyTorch frameworks are capable of training neural networks effectively for satellite image classification. Performance variations observed across different sample sizes and architectures offer insights into the importance of tuning and dataset preparation. Further improvements could include convolutional neural networks (CNNs) or more advanced architectures to better capture spatial features in image data.