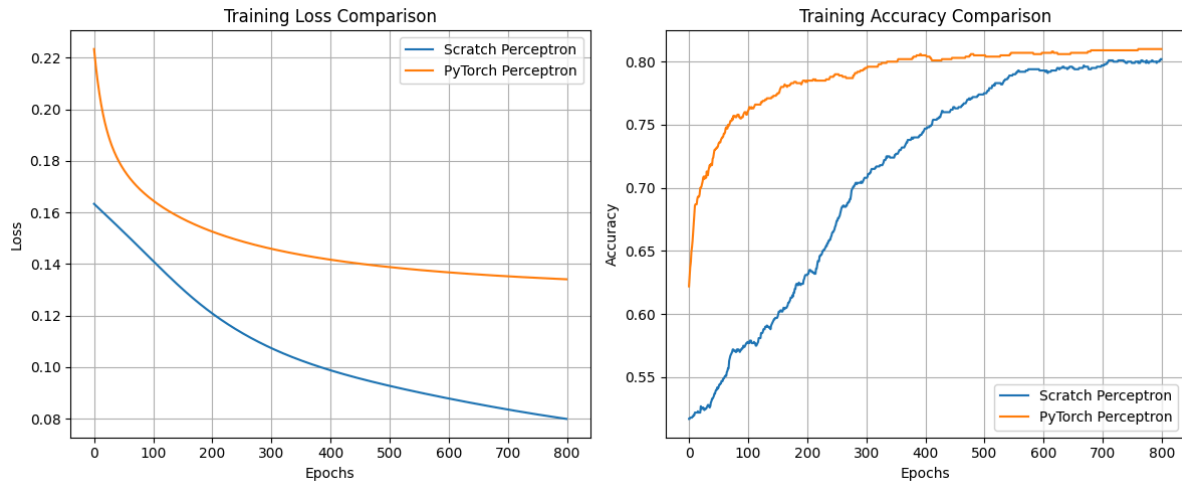


DL - LAB 3

Analysis of the obtained results

Task 1:



Final results:

Scratch Perceptron - Final Loss: 0.0799

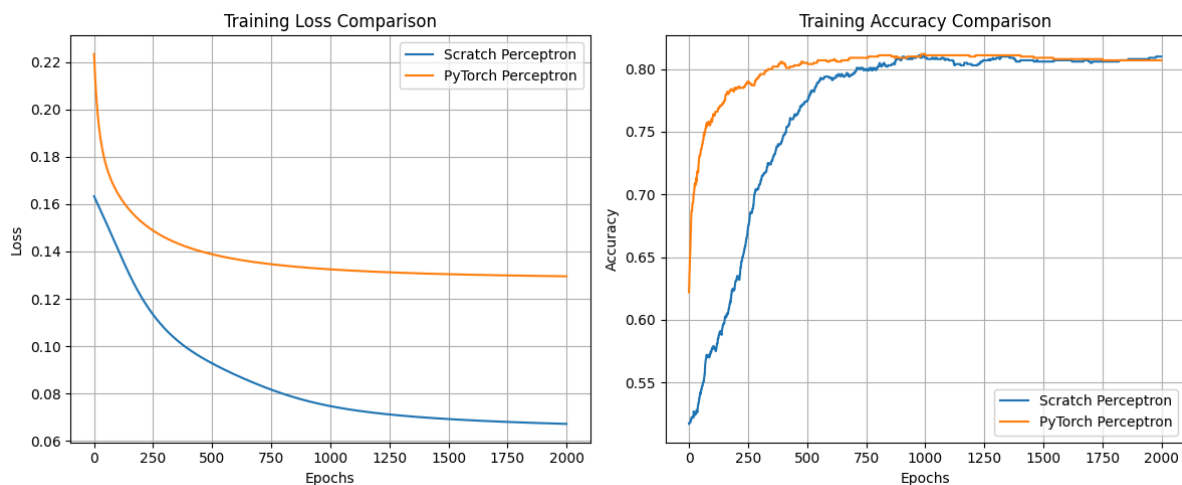
PyTorch Perceptron - Final Loss: 0.1341

Scratch Perceptron - Final Accuracy: 0.8020

PyTorch Perceptron - Final Accuracy: 0.8100

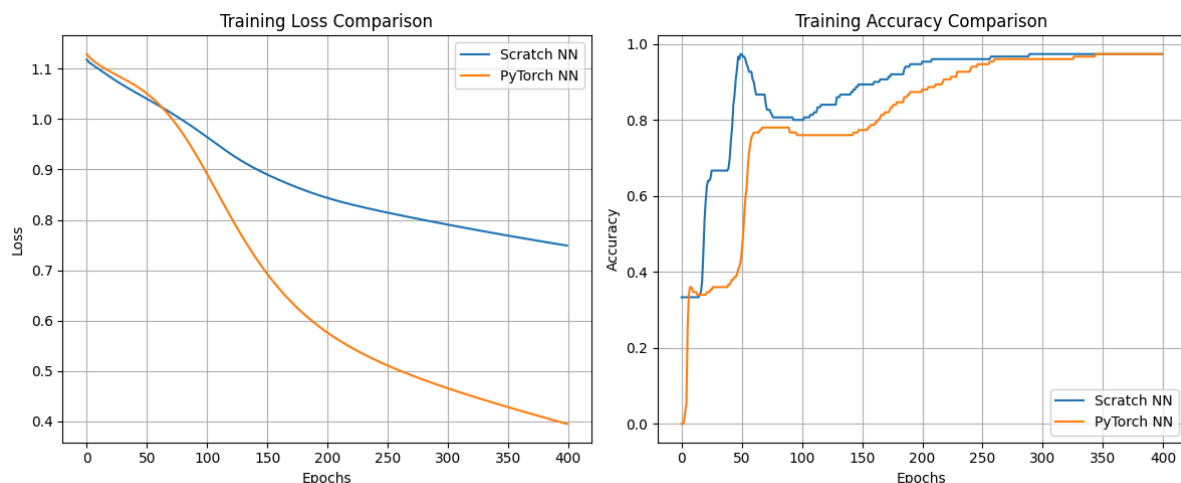
Key points:

- From a **performance perspective**, both models achieve similar behaviour, 80.2% respectively 81% accuracy after 800 epochs. At first sight, the best result seems to be obtained by using the classical PyTorch approach, but we continue training further until around 2000 epochs, and we obtain the same result (81% accuracy). That being said, both models obtain the same performance, the main difference being in the epoch number best from training.



- From a **convergence speed perspective**, the classical PyTorch model seems to outperform our scratch implementation. As a comparison, the Pytorch model achieves 81% accuracy in training after around 800 epochs, while our scratch model achieves the same result after 2000 epochs. This difference in convergence speed is caused by optimisation made inside Pytorch framework.

Task 2:



Final result:

Scratch accuracy: 0.9733333333333334

PyTorch accuracy: 0.9733333587646484

Key points:

- From a **performance perspective**, same as task1, we get some performance results, after around 350-400 epochs, accuracy on both models is 97.33%, only difference being in time required to reach this expected value.
- From a **convergence speed perspective**, we had surprising results, where our scratch model overpass convergence speed. Even though our model is much faster, the PyTorch model seems more consistent, evolution being slow but steady, while our model got a first bump high value of 96.8% after only 50 epochs, we will need 300 more epochs to get back to this value and overcome this value.