

Université de Bordeaux
Image & Son

DLCV Lab 2

Report

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1 Simple Neural Network

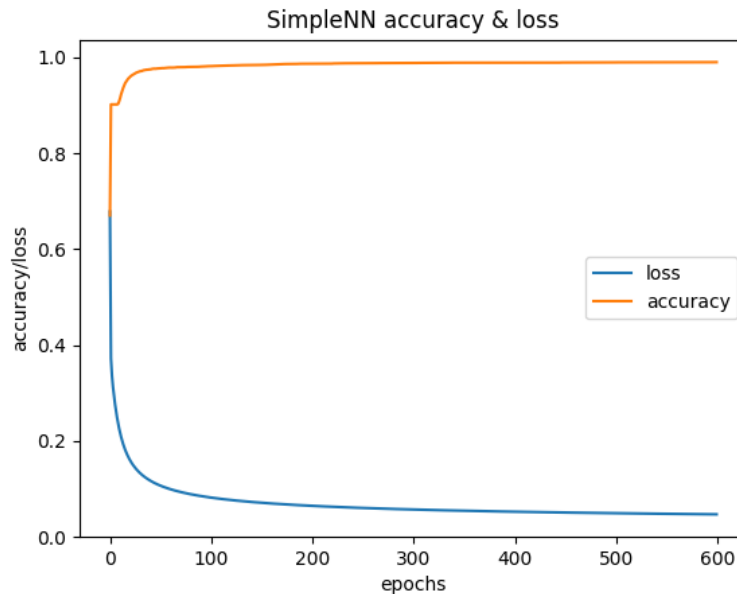
All the mathematical expressions needed for the Neural Networks to run are fully implemented in the code.

We trained our Neural Network with different amounts of epochs, and we saw that the more we put, the more accurate it became. At about 560 epochs, the accuracy started to converge towards 100%. In the meantime, the loss is as well almost not moving anymore.

```
Epoch : 598
Loss value : 0.04677860906823947
Accuracy : 0.9902
Epoch : 599
Loss value : 0.04675829537575301
Accuracy : 0.9902
Epoch : 600
Loss value : 0.046738032436221814
Accuracy : 0.9902
```

The very first epoch being computed considering random values, it is expected to observe a drastic change between epochs 0 and 1.

Figure 1: Accuracy & Loss of Simple Neural Network with 600 epochs



2 Hidden layer Neural Network

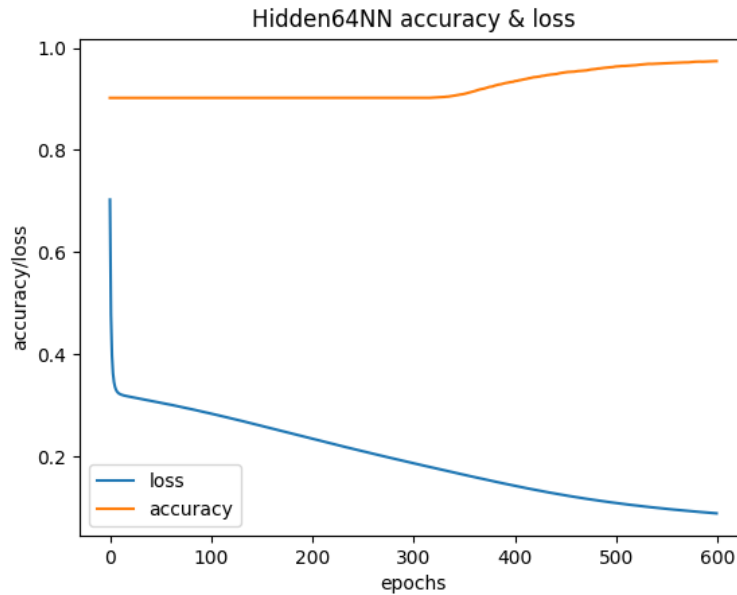
We did the same thing with the hidden layer Neural Network than with the simple one. However we noticed that this one's accuracy stays constant for a large amount of epochs, before it eventually starts increasing.

```
Epoch : 598
Loss value : 0.09607806982240087
Accuracy : 0.97
Epoch : 599
Loss value : 0.09590623067761345
Accuracy : 0.9701
Epoch : 600
Loss value : 0.09573508894688514
Accuracy : 0.9702
```

The accuracy seems to increase faster than the Simple Neural Network's one.

Thus, it can be expected to observe a lighter convergence for the Hidden layer Neural Network's curve, compared to the Simple Neural Network's one at the same epoch beyond around 350 units.

Figure 2: Accuracy & Loss of Hidden layer of 64-sized Neural Network with 600 epochs



3 Comparison

As we mentioned earlier, the Simple Neural Network is globally more accurate than the Hidden layer one, its accuracy starts converging much earlier, around 30 epochs, meanwhile the other, as we said earlier, stays constant until around 350 epochs.

Figure 3: Accuracy & Loss of Hidden layer of 64-sized Neural Network with 600 epochs

