

## **Lab 6 - Report**

*(Note: When we are talking about loss & accuracy, we are referring to the validation values)*

### **Task 1**

**Answer)** The performance of the network is really good with the following results for different settings of number of neurons:

If neurons are set to 20 then we get a loss & MAE of 0.0010 and 0.0279.

If neurons are set to 40 then we get a loss & MAE of 7.5490e-04 and 0.023.

What we can observe, is that increasing the number of neurons results in a slight increase in performance.

### **Task 2**

**Answer)** Again, the performance of the network was really good, and this is to be expected of a task this easy. The results were as following:

If neurons are set to 10 then we get a loss & accuracy of 0.0069 and 1.0000.

If neurons are set to 5 then we get a loss & accuracy of 0.0000 and 1.0000.

When adding more neurons, the network starts to overfit and in turn, produces slightly worse results.

### **Task 3**

**Answer)**

#### **With LSTM layer**

For this task we used data augmentation and 50 epochs. This gave us the following results:

Loss & accuracy of 0.1047 and 0.8957, precision & recall of 0.8920 and 0.9093

There was no overfitting, and the learning curve was stable.

#### **Without LSTM layer**

When using the same 80/20 split and data augmentation without the LSTM layer and the same learning rate (1E-5), the training did not converge.

When lowering the learning rate to 0.0001 we got the following results:

Loss & accuracy of 0.1235 and 0.8770, precision & recall of 0.8788 and 0.8843

### **Conclusion**

The LSTM layer thus provided slightly better results, with a much more stable learning curve than compared to the network without LSTM layer.