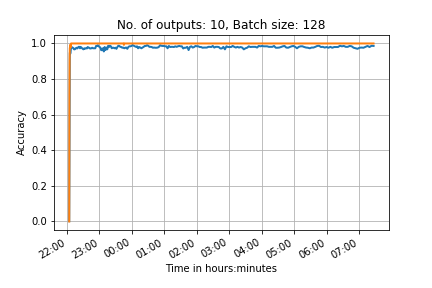
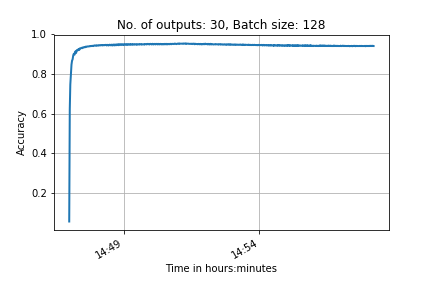
**Weekly report**

*Work on transfer learning*

Successfully transferred from a neural network with ten outputs to a network with 30 outputs yielding 95% accuracy. This must now be compared with training for 30 outputs from scratch.

Below is the training graph for training on ten outputs for the usual CNN structure. In addition is the training graph for retraining the last layer.





*Work on Neural network class*

Neural networks are now easy to build using the class that Seb finished. The class has been successfully implemented numerous times.

*Work on TFRecords*

TFRecords now works entirely successfully.

We can normalise the images to the range [-0.5,0.5] which speeds up training by a factor of 4 when tested on 10 outputs.

We can shuffle the data which improves training accuracy and decreases training time (drastically).

We can perform a more advanced normalisation that takes into account the image’s mean and standard deviation (in pixel values). This works even better!

A final normalisation would be to normalise each batch at a time. This is not done yet.

Because normalisation speeds up the process, we can train networks with many more convolution layers. A network for 10 outputs was trained on 6 convolution layers.

It was found that increasing the number of layers is more effective than increasing the number of outputs per layer (which slows down the process).

Our graphs may show overfitting. We may want to increase the dropout factor.

All relevant graphs are in the lab book so have not been copied here.

**Action points for the next week**

1. Carry on working on visualising the feature maps of our neural network for 100 outputs .

2. Train a network for 30 outputs to compare with transfer learning

3. train a network for 100 outputs and transfer learn to 3866 outputs

4. Start working on the GAN for Chinese characters.

6. Segment the entire Baotu Spring poem.