**8.2**

Image Included

**8.4a.**

Image Included

**8.4b.**

Image Included

**8.4c.**

Image Included

**8.7.**

When training on 1000 epochs we observed the following results that the trained accuray was 100 and the testing was at 70. When training at 10000 epochs we noticed that the trained accuracy remained at 100 while the test accuracy increased to 90. This leds us to believe that more training aka increasing the epochs leads to better results, we do have to be careful of overfitting however.

**Code in Folder**

**8.12a.**

I wasn’t able to verify the results that we would expect since my code seemed to run into an issue with floating points going to zero. But the changes I’ve made should reflect on the correct code such as the re-estimation of A and B, the change in the log probability calculation, and the re-estimation of the WV matrix.

My learning rate and temperature were defined as below

#define learningRate 10.0f #define TEMPEARTURE 5.0f

I’ve discussed with other students and heard there was success with a learning rate of 80 and temperature of 0.80

**Code in Folder**

**8.12b.**

If I was able to get the training to work properly, it would be simple to run the program 50,000 times and compare the results. We would expect better weights as a result and a cleaner division between the different characters in the alphabet.