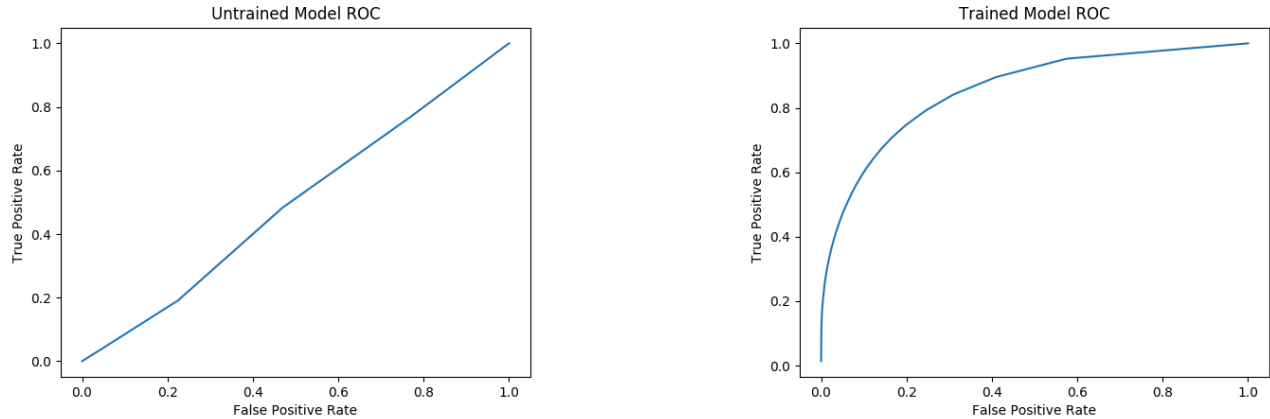# 1 Question 5

FIGURE 1 – **Classification Performance.** This figure shows the ROC curves for the model before and after training. The AUC was 0.5068 and increased to 0.7586 after training. We notice there was a significant performance increase.

For questions 5.2 to 5.5, the maximum activations for each kernel were recorded. Then, each kernel is converted into a normalized PWM by counting the base-pair occurences of sequences that reach at least 50% of the max activation. Finally, a Pearson correlation coefficient is used to find the most similar PWMs to CTCF.
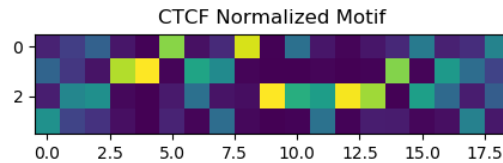

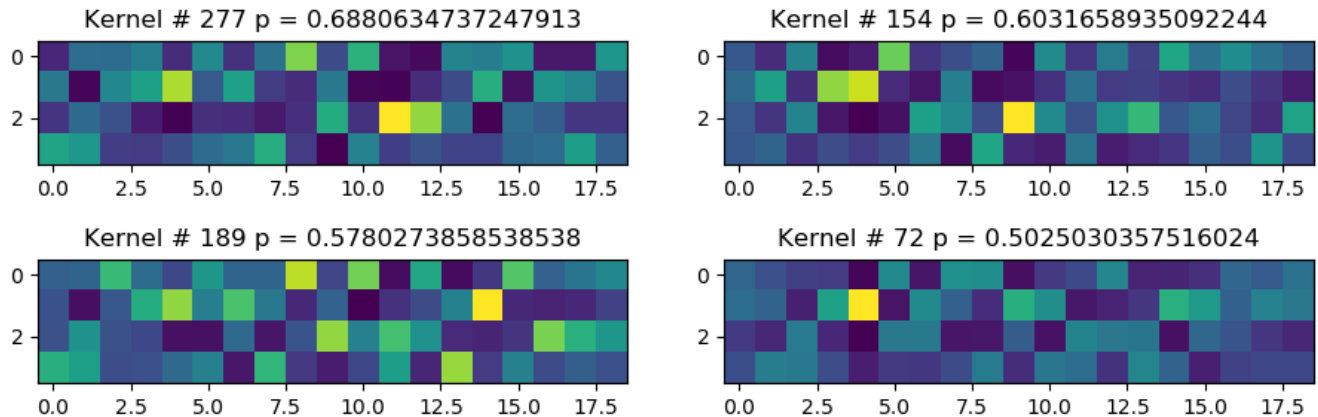FIGURE 2 – **CTCF.** Normalized CTCF Motif loaded from the provided jaspar file.

FIGURE 3 – **Learned kernel-derived PWMs.** This figure shows the four most similar PWMs to CTCF derived from the learned kernels of the first convolution of our network. We can see that there are some similar patterns, and deduce that the first convolutional layer learns to detect some known PWM features. The highest similarity score is 0.688