CS498 Final Take Home Exam Report

Wei Shi	Shuo Feng	Yuchen Qian
weishi3	sfeng15	yqian14

Problem 1: See the graph p1.png **accuracy 0.9811**
Problem 2: See the graph p2.png **accuracy 0.9837**
Problem 3: See the graph p3.png **accuracy 0.500 after 2000 steps training**
Problem 4: See the graph p4.png **accuracy 0.809 after 10000 steps training (0.540 after 2000 steps training)**

Modifications we made:
For problem 2, we added a new convolutional layer and fully connected layer. In the convolutional layer, we increased convolutional filters from 64 to 128 to keep the total number of weights unchanged so that the information is preserved. The reason why we doubled the number of neurons it is that the last max pooling layer reduces the size of the feature map half of the original size. Also, we set the size of each convolutional filter to be 5*5 according to the heuristics according to literature. In order to increase the non-linear properties fo the decision function, we added a relu layer after For fully connected layer, we decided to use 1024 neurons according to the heuristics. It turns out that the accurary is better than before. We also tried dropping the max-pooling layer while the training speed is much slower than before. Therefore, we decide to keep the original max-pooling layer.

For problem 4, we added a new convolution layer, a normalization of the layer and a deeply condense layer. The reason why we used a normalization layer was that we wanted to ensure that there were no large values fed into each layer. We set the size of each convolutional filter to be 5*5 according to the heuristics according to literature. We chose this size because filters with smaller size can extract the pattern better. In order to increase the non-linear properties fo the decision function, we added a relu layer after and fed the output of the convolution. For fully connected layer, we decided to use 192 which is consistent with before. It turns out that the accurary is better than before. As we mentioned earlier,we decide to keep the original max-pooling layer to have a decent training speed.