機器學習概論 Introduction to Machine Learning
Assignment 4 – Convolutional Neural Network
Department: 理學院學士班
Student ID: 108020017 Name: 黃珮綺
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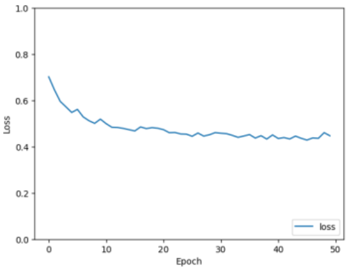
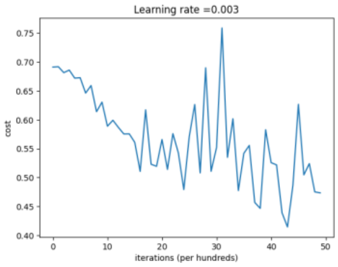
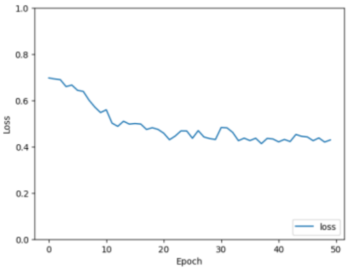
1. Comparing models

	Linear Model	CNN Model	Tensorflow CNN
epoch	50	50	50
training time	10.8s	51m 25.2s	2m 58.7s
accuracy	0.8167	0.8416	0.8250
numbers of parameters	1, 025	7, 153	2, 184577
training loss curve			
others	The CNN models improve the accuracy. However, the accuracy of Tensorflow CNN is lower than my CNN model. It could be the reason of overfitting. Moreover, the two CNN models have larger numbers of parameters and take more time on training.		

2. Advanced Part Implementaion

I designed my model based on the basic part, and added more convolution layers and max pooling layers. I also adjusted the output dimension of each layer. The reason why I didn’t add more convolution layer is that the data dimension would become too small for the training process, which led to low accuracy. As for the output dimension of each layer, I manually check the model is not overfitted nor underfitted. This is done by comparing the loss curve of the training dataset and validation dataset, respectively. Furthermore, I used binary cross entropy as the loss function, and Adam as the optimizer. Since the model is a binary classier, I simply use binary cross entropy as my loss function. And Adam is generally the best choice for optimizer, because it takes advantage of RMSprop and is similar to momentum. In the end the model is as below: