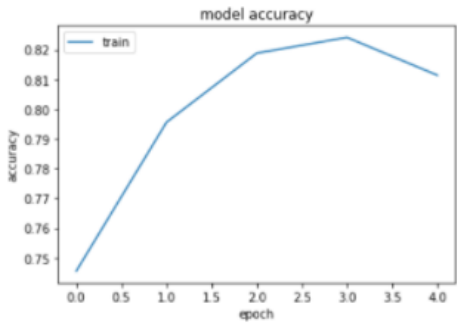
HW4

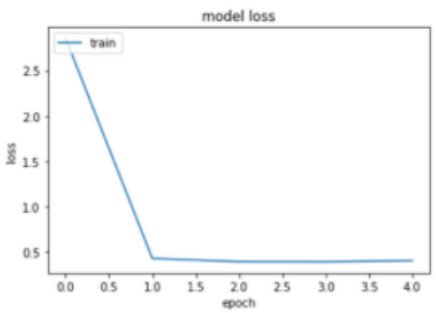
basic

- model architecture：3 layers Convolution Neural Network and 2 layers Fully Connected Neural Network
  - First layer：CNN with 32 filters, 3 x 3 kernel size, relu activation function, and (2, 2) pooling
  - Second layer：CNN with 64 filters, 3 x 3 kernel size, relu activation function, and (2, 2) pooling
  - Third layer：CNN with 128 filters, 3 x 3 kernel size, relu activation function, (2, 2) pooling, and flatten the output
  - Fourth Layer：Fully Connected Neural Network with output dimension 256, relu activation function, and then dropout 0.5 to the output
  - Fifth Layer：Fully Connected Neural Network with output dimension 1, and sigmoid activation function
  - hyperparameter
    - loss：calculated by using binary cross entropy
    - optimizer：adam
    - learning rate：0.001
- training：traing the data with 5 epochs and the batch size is 64

the accuracy of the traing data



the loss of the training data

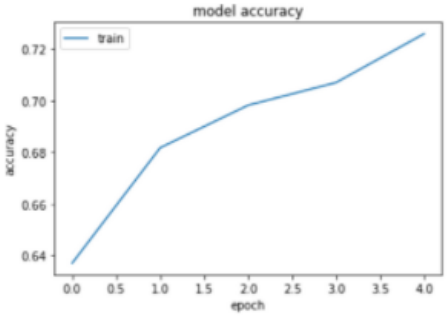


- Validation：The weighted F1 score for the validation dataset is 0.84
- Problem encountered：Tunning the hyperparameter, ex: tunning the drop out from 0.25 to 0.5 in the last layer, and the accuracy of the training dataset changes from 0.77 to 0.82

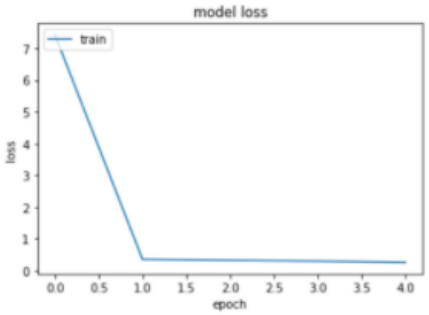
Advanced

- model architecture：2 layers Convolution Neural Network and 2 layers Fully Connected Neural Network
  - First layer：CNN with 32 filters, 3 x 3 kernel size, relu activation function, and (2, 2) pooling
  - Second layer：CNN with 64 filters, 3 x 3 kernel size, relu activation function, (2, 2) pooling, and then flatten the output dimennsion
  - Third Layer：Fully Connected Neural Network with output dimension 512, relu activation function, and then dropout 0.5 to the output
  - Fourth Layer：Fully Connected Neural Network with output dimension 1, and sigmoid activation function
  - loss：calculated by using binary cross entropy
  - optimizer：adam
  - hyperparameter
    - loss：calculated by using binary cross entropy
    - optimizer：adam
    - learning rate：0.001
- training：traing the data with 5 epoch and the batch size is 64

the accuracy of the traing data



the loss of the training data



- Validation：the Weighted F1 Score of the validation dataset is 0.59
- Problem encountered：原本在advanced problem嘗試使用3層CNN和2層Fully Connected Neural Network，但是發現accuracy一直都很低，後來改成使用2層CNN和2層Fully Connected Neural Network，並調整部分參數，就得到了比原本好很多的accuracy。