HW 4 Dingying Lu

1. Parameter tuning
   The accuracy for different combinations of learning rate η and λ of logistic loss and hinge loss is shown below.

(1) Logistic loss

λ \ η	0.0001	0.001	0.01	0.1
0.1	0.95	0.85	0.85	0.8
0.3	0.95	0.9	0.75	0.75
1	0.95	0.85	0.7	0.6

For logistic loss, we find that the combination of $\eta = 0.001, \lambda = 1, \eta = 0.01, \lambda = 0.1$, $\eta = 0.1, \lambda = 0.3$ generate relatively better performance. So we report the loss of each iteration for these three combinations in Logistic.txt.

(2) Hinge loss

λ \ η	0.0001	0.001	0.01	0.1
0.1	0.7	0.8	0.75	0.9
0.3	0.7	0.8	0.9	0.75
1	0.9	0.9	0.65	0.6

For hinge loss, we find that the combination of $\eta = 0.0001, \lambda = 1, \eta = 0.0001, \lambda = 0.3$, $\eta = 0.0001, \lambda = 0.1$ generate relatively better performance. So we report the loss of each iteration for these three combinations in Hinge.txt.

2. Results on test data
   After tuning the parameters on development data, we choose $\eta = 0.0001, \lambda = 1$ for logistic loss, $\eta = 0.001, \lambda = 1$ for hinge loss. And the accuracy is shown as below.

(1) Logistic loss

λ \ η	0.0001
1	0.8529

(2) Hinge loss

λ \ η	0.001
1	0.8235

3. Inspecting the model

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Sentence (negative):
[array([u'CALC'],
      dtype='<U4'), array([u'CALC'],
      dtype='<U4'), array([u'CALC'],
      dtype='<U4'), array([u'CALC'],
      dtype='<U4'), array([u'CALC'],
      dtype='<U4'), array([u'CALC'],
      dtype='<U4'), array([u'CALC'],
      dtype='<U4'), array([u'CALC'],
      dtype='<U4'), array([u'CALC'],
      dtype='<U4')]
Picture (positive):
[array([u'LDLPFC'],
      dtype='<U6'), array([u'LDLPFC'],
      dtype='<U6'), array([u'CALC'],
      dtype='<U4'), array([u'LDLPFC'],
      dtype='<U6'), array([u'CALC'],
      dtype='<U4'), array([u'CALC'],
      dtype='<U4'), array([u'LDLPFC'],
      dtype='<U6'), array([u'CALC'],
      dtype='<U4'), array([u'LDLPFC'],
      dtype='<U6'), array([u'LDLPFC'],
      dtype='<U6')]
```