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CS 4342 D 21 D01
Professor Jacob Whitehill
15 April 2021
Homework 3

Training loss during the last 20 mini-batches of SGD:

```
C:\Users\loren\AppData\Local\Microsoft\WindowsApps\p
Batch 80 : fCE: 0.19685091355898932 ,  fPC: 0.95
Batch 81 : fCE: 0.19684932268521205 ,  fPC: 0.95
Batch 82 : fCE: 0.19684788020234037 ,  fPC: 0.95
Batch 83 : fCE: 0.19684659324263284 ,  fPC: 0.95
Batch 84 : fCE: 0.19684540571473905 ,  fPC: 0.95
Batch 85 : fCE: 0.19684436326853522 ,  fPC: 0.95
Batch 86 : fCE: 0.19684341377429582 ,  fPC: 0.95
Batch 87 : fCE: 0.1968425652040616 ,  fPC: 0.95
Batch 88 : fCE: 0.1968417916686978 ,  fPC: 0.95
Batch 89 : fCE: 0.1968410887656968 ,  fPC: 0.95
Batch 90 : fCE: 0.19684045697740665 ,  fPC: 0.95
Batch 91 : fCE: 0.1968398833106219 ,  fPC: 0.95
Batch 92 : fCE: 0.1968393692981218 ,  fPC: 0.95
Batch 93 : fCE: 0.19683889857477121 ,  fPC: 0.95
Batch 94 : fCE: 0.1968384809491852 ,  fPC: 0.95
Batch 95 : fCE: 0.19683809747800676 ,  fPC: 0.95
Batch 96 : fCE: 0.1968377485694136 ,  fPC: 0.95
Batch 97 : fCE: 0.19683742874134333 ,  fPC: 0.95
Batch 98 : fCE: 0.19683714115519096 ,  fPC: 0.95
Batch 99 : fCE: 0.19683688492555387 ,  fPC: 0.95
PC Accuracy for Training Set: 0.95
PC Accuracy for Testing Set: 0.882
CE Loss for Training Set: 0.19683688492555387
CE Loss for Testing Set: 0.4179812872540566

Process finished with exit code 0
```

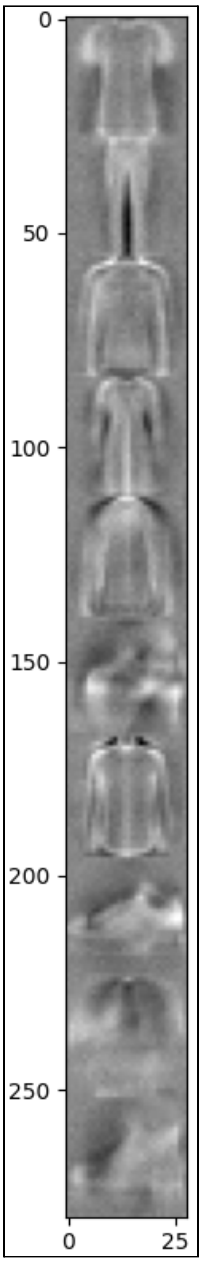
CE loss and the PC accuracy (percent correctly classified images) on the test set:

From the screenshot above:

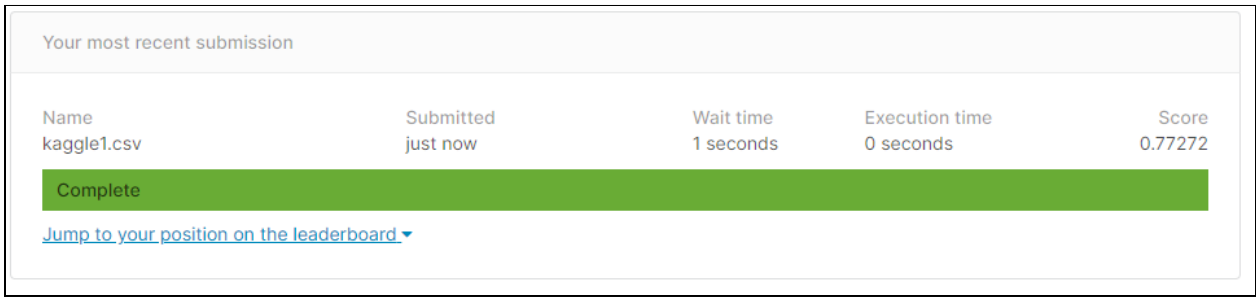
a) PC Accuracy for Testing Set: 0.882
b) CE Loss for Testing Set: 0.4179812872540566

The implementation of Stochastic gradient descent leads to better accuracy/less CE loss over the n = 100 batches, though this amount is only slight as noted by the fCE values across the final 20 batches.

Create an image to visualize each of the trained weight vectors w1, . . . , w10 (similar to what you did in homework 2) and include it in the PDF



2) Kaggle Titanic Competition Results:



The model had an accuracy of **0.77272**.

Some conclusions could be drawn from the data, including:

Sex: There was a large disparity in the survival rate of males and females, as women (and children) were evacuated off of the Titanic before men.
Pclass: Passengers with a first class ticket were more likely to survive than passengers with a second or third class ticket.
SibSp: Passengers who were part of a group had a higher survival rate than those who were aboard alone.

*Note: to run either the fashion or titanic implementations, change the “fashion” or “titanic” variables to true in the main class