✖

Lecture 6 Quiz

5 questions

<div style="border:1px solid; display:inline-block; padding:10px; text-align:center;">

1
point

</div>

1.

Suppose w is the weight on some connection in a neural network. The network is trained using gradient descent until the learning *converges*. We plot the change of w as training progresses. Which of the following scenarios shows that convergence has occurred? **Notice that we're plotting the change in w, as opposed to w itself.**

Note that in the plots below, each *iteration* refers to a single *step* of steepest descent on a *single minibatch*.

○

○

Change
in w

0

Iterations

○

Change
in w

0

Iterations

○

Change
in w

0

Iterations
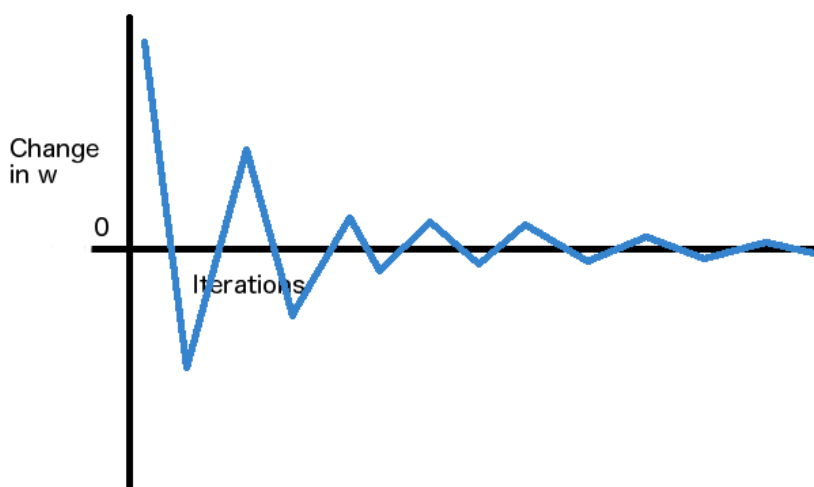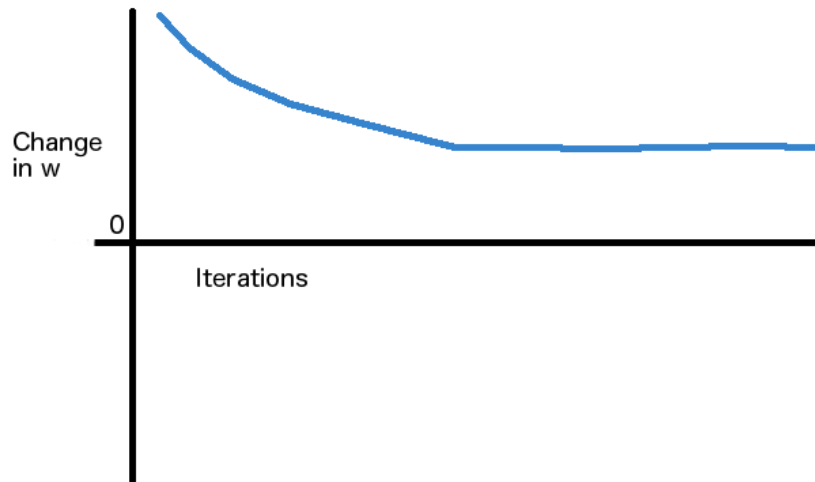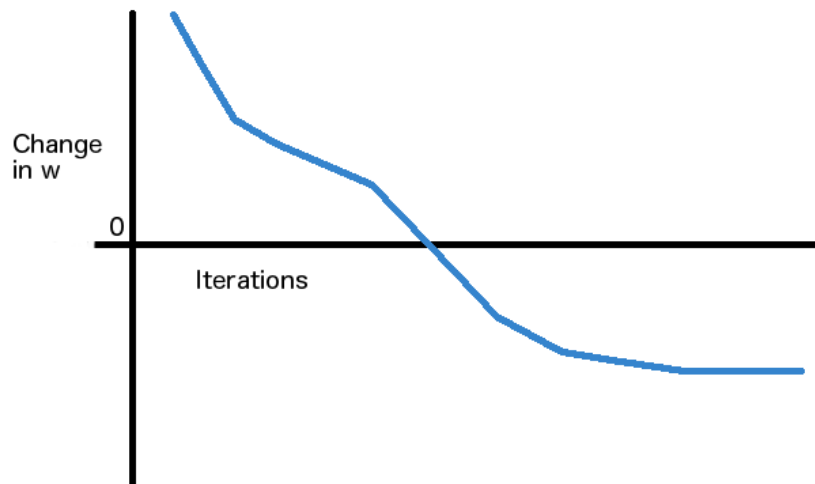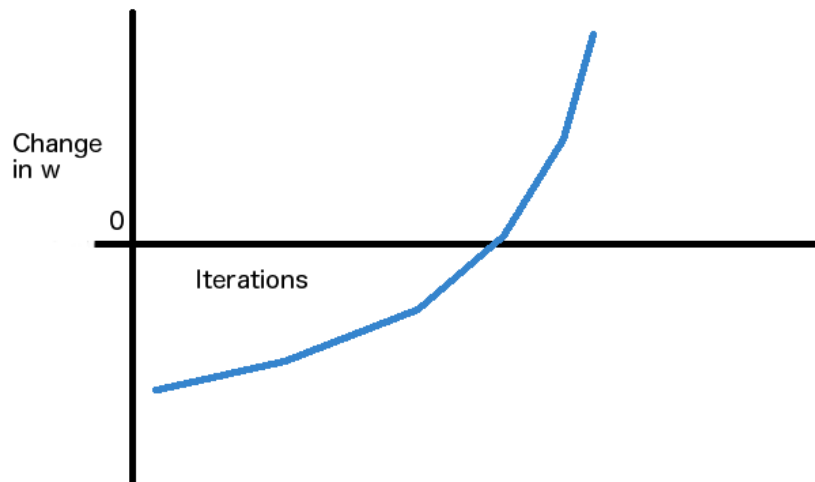
1
point

2.

Suppose you are using mini-batch gradient descent for training some neural net on a large dataset. You have to decide on the learning rate, weight initializations, preprocess the inputs etc. You try some values for these and find that the value of the objective function on the training set decreases smoothly but very slowly. What could be causing this? Check all that apply.

☐   The learning rate may be too small.

☐   The minibatch size is too small.

☐   The inputs might have a very large scale (hint: think of what this would do to the logistic hidden units).

☐   The weights might have been initialized to very large values (hint: think of what this would do to the logistic hidden units).


1
point

3.

Full-batch gradient descent can be used to minimize an objective function if the dataset is not too large. Which statement regarding full-batch gradient descent is **false**?

○   There is always a learning rate schedule such that the objective function monotonically decreases.

○   Adaptive learning rate methods perform well for full-batch (or large mini-batch) gradient descent.

○   For every **fixed** learning rate, the objective function will monotonically decrease.

○   For some setting of the learning rate, it is possible that the objective function increases in some iteration.


1
point

4.

Claire is training a neural net using mini-batch gradient descent. She chose a particular learning rate and found that the training error decreased as more iterations of training were performed as shown here in blue

Training
Error
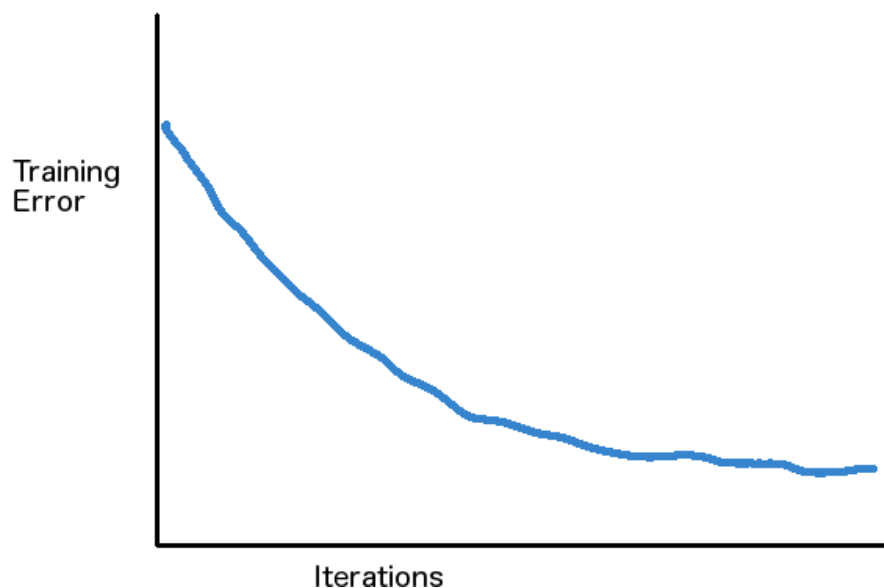
Iterations

She was not sure if this was the best she could do. So she tried a **smaller** learning rate. Which of the following error curves (shown in red) might she observe now? Select the two most likely plots.

Note that in the plots below, each *iteration* refers to a single *step* of steepest descent on a *single minibatch*.

☐

Training
Error

Iterations

☐

☐

☐
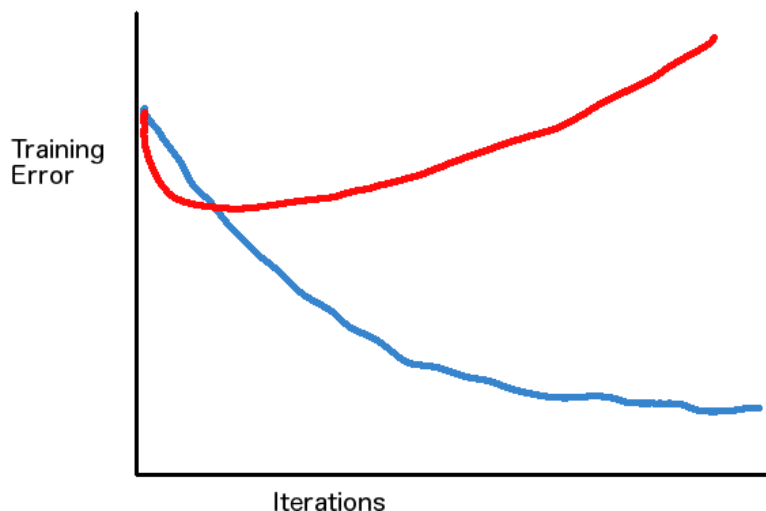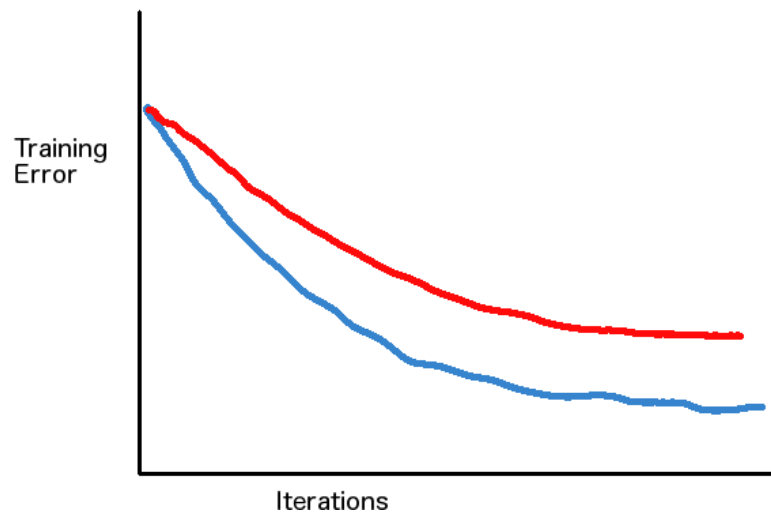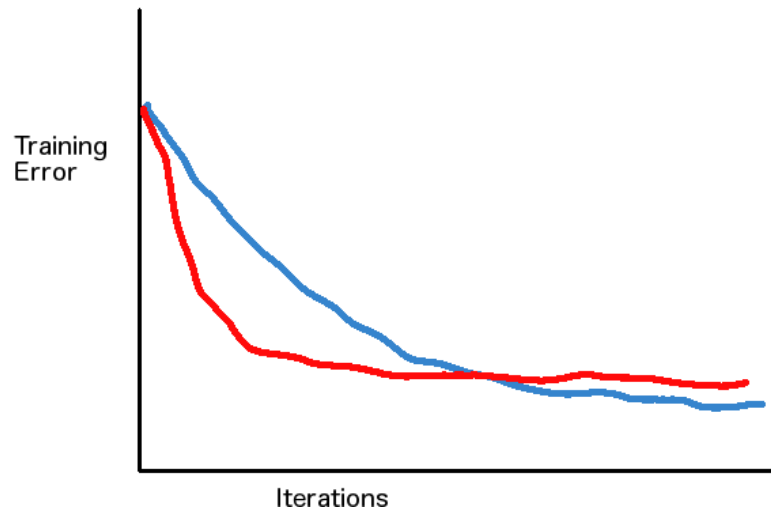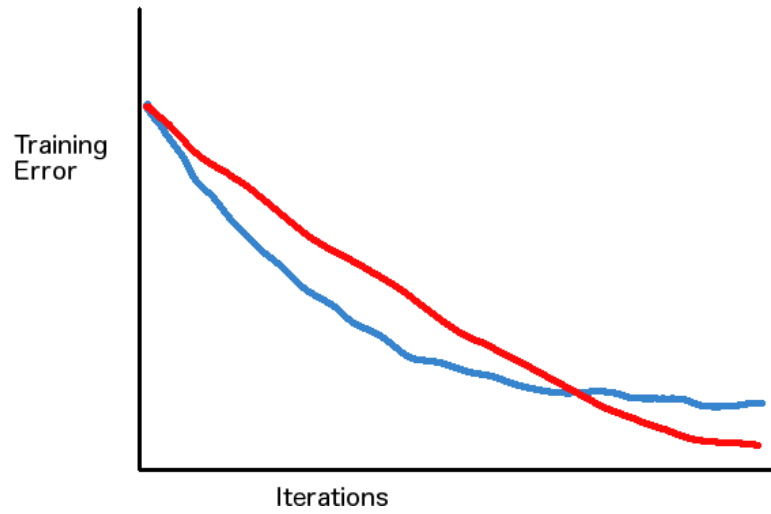
1
point

5.

In the lectures, we discussed two kinds of gradient descent algorithms: mini-batch and full-batch. For which of the following problems is mini-batch gradient descent likely to be **a lot better** than full-batch gradient descent?

- ☐ Sentiment Analysis: Decide whether a given movie review says that the movie is 'good' or 'bad'. The input consists of the word count in the review, for each of 50,000 words. The training set consists of 100 movie reviews written by experts for a newspaper.

- ☐ Disease prediction: Predict if a person will get cancer. The input consists of 1000 medical indicators (blood pressure, family cancer history, etc.); the training set consists of 100 patients who all suffered the same type of cancer, and 100 healthy patients.

- ☐ Object detection: Identify which of 1000 categories an object image belongs to, given 10 million 256 X 256 pixel images.

- ☐ Speech recognition: Identify which of 40 phonemes is being pronounced in a 10-millisecond window of speech sound. The training data consists of 50,000 hours of speech data (this is more than 10 billion 1800 dimensional training points)

☐ I, **Jian Wang**, understand that submitting work that isn't my own may result in permanent failure of this course or deactivation of my Coursera account. Learn more about Coursera's Honor Code

2 questions unanswered

Submit Quiz

👍   👎   🏳