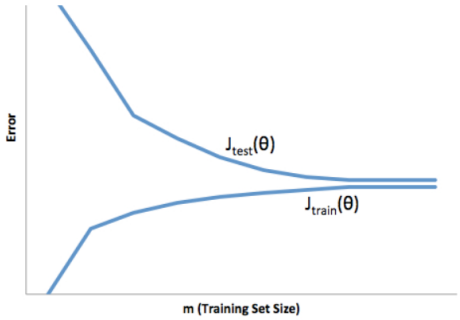
Advice for Applying Machine Learning

TOTAL POINTS 5

1. You train a learning algorithm, and find that it has unacceptably high error on the test set. You plot the learning curve, and obtain the figure below. Is the algorithm suffering from high bias, high variance, or neither? 1 point



- ○ High variance
- ◉ High bias
- ○ Neither

2. Suppose you have implemented regularized logistic regression to classify what object is in an image (i.e., to do object recognition). However, when you test your hypothesis on a new set of images, you find that it makes unacceptably large errors with its predictions on the new images. However, your hypothesis performs **well** (has low error) on the training set. Which of the following are promising steps to take? Check all that apply. 1 point

- ☑ Try using a smaller set of features.
- ☐ Use fewer training examples.
- ☑ Get more training examples.
- ☐ Try adding polynomial features.

3. Suppose you have implemented regularized logistic regression to predict what items customers will purchase on a web shopping site. However, when you test your hypothesis on a new set of customers, you find that it makes unacceptably large errors in its predictions. Furthermore, the hypothesis performs **poorly** on the training set. Which of the following might be promising steps to take? Check all that apply. 1 point

- ☑ Try adding polynomial features.
- ☐ Try using a smaller set of features.
- ☐ Try increasing the regularization parameter λ.
- ☑ Try to obtain and use additional features.

4. Which of the following statements are true? Check all that apply. 1 point

- ☑ A typical split of a dataset into training, validation and test sets might be 60% training set, 20% validation set, and 20% test set.

- [ ] Suppose you are training a logistic regression classifier using polynomial features and want to select what degree polynomial (denoted d in the lecture videos) to use. After training the classifier on the entire training set, you decide to use a subset of the training examples as a validation set. This will work just as well as having a validation set that is separate (disjoint) from the training set.

- [x] Suppose you are using linear regression to predict housing prices, and your dataset comes sorted in order of increasing sizes of houses. It is then important to randomly shuffle the dataset before splitting it into training, validation and test sets, so that we don't have all the smallest houses going into the training set, and all the largest houses going into the test set.

- [ ] It is okay to use data from the test set to choose the regularization parameter λ, but not the model parameters (θ).

5. Which of the following statements are true? Check all that apply. 1 point

- [ ] We always prefer models with high variance (over those with high bias) as they will able to better fit the training set.

- [x] When debugging learning algorithms, it is useful to plot a learning curve to understand if there is a high bias or high variance problem.

- [x] If a learning algorithm is suffering from high variance, adding more training examples is likely to improve the test error.

- [x] If a learning algorithm is suffering from high bias, only adding more training examples may **not** improve the test error significantly.

- [x] I, **Long Hải Hoàng**, understand that submitting another's work as my own can result in zero credit for this assignment. Repeated violations of the Coursera Honor Code may result in removal from this course or deactivation of my Coursera account.

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