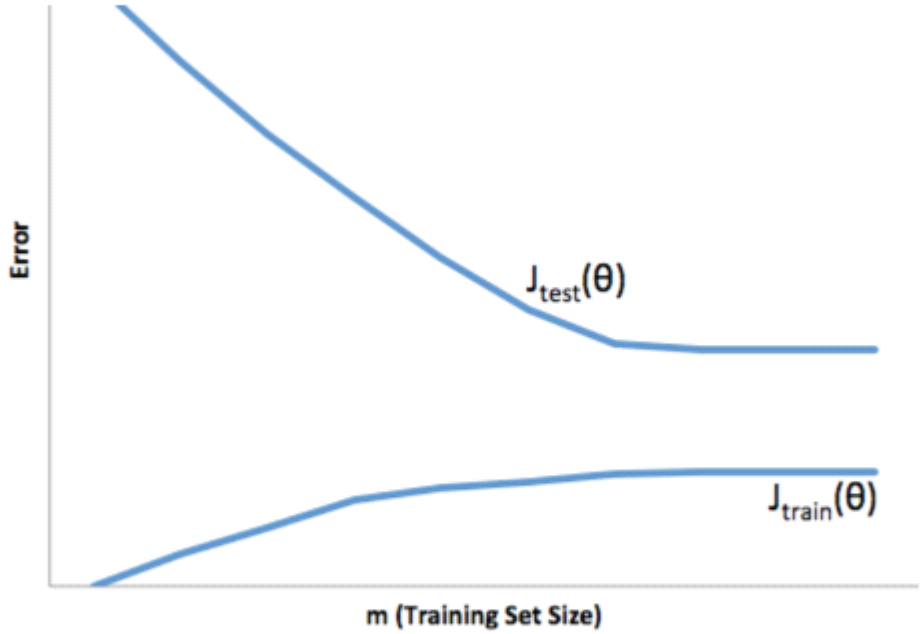
W6-1 Advice for Applying Machine Learning

Saturday, September 3, 2016 8:53 PM

Right: 1, 2, 3, 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?



- ○ Neither
- ○ High bias
- ● High variance

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.

- [ ] Try adding polynomial features.
- [x] Try using a smaller set of features.
- [ ] Use fewer training examples.
- [x] Get more training examples.

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.

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

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

- [ ] Suppose you are training a regularized linear regression model.The recommended way to choose what value of regularization parameter λ to use is to choose the value of λ which gives the lowest **training set** error.
- [ ] Suppose you are training a regularized linear regression model. The recommended way to choose what value of regularization parameter λ to use is to choose the value of λ which gives the lowest **test set** error.
- [x] Suppose you are training a regularized linear regression model. The recommended way to choose what value of regularization parameter λ to use is to choose the value of λ which gives the lowest **cross validation** error.
- [ ] The performance of a learning algorithm on the training set will typically be better than its performance on the test set.

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

- [ ] 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.