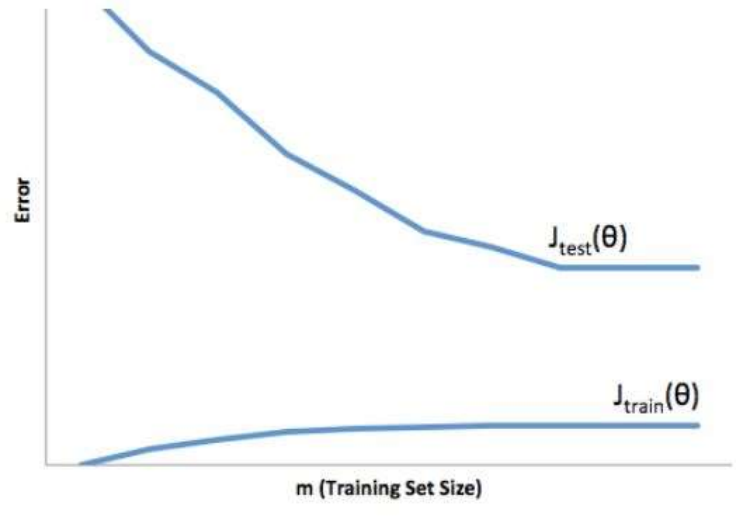# Advice for Applying Machine Learning

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

- ○ Neither
- ● High variance
- ○ High bias

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 using a smaller set of features.

   - ☐ Try adding polynomial features.

   - ☐ Use fewer training examples.

   - ☑ 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 adding polynomial features.

- [ ] Use fewer training examples.

- [ ] Try evaluating the hypothesis on a cross validation set rather than the test set.

- [x] Try decreasing the regularization parameter λ.

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

☑ The performance of a learning algorithm on the training set will typically be better than its performance on the test set.

☐ 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 **cross validation** 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.

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

☐ If a neural network has much lower training error than test error, then adding more layers will help bring the test error down because we can fit the test set better.

☑ A model with more parameters is more prone to overfitting and typically has higher variance.

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

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