! 准备好后再次尝试

通过条件 80% 或更高

再试

成绩
40%

Machine Learning System Design

最新提交作业的评分

40%

1. **You are working on a spam classification system using regularized logistic regression. "Spam" is a positive class (y = 1) and "not spam" is the negative class (y = 0). You have trained your classifier and there are m = 1000 examples in the cross-validation set. The chart of predicted class vs. actual class is:**

0/1 分

	Actual Class: 1	Actual Class: 0
Predicted Class: 1	85	890
Predicted Class: 0	15	10

For reference:

- **Accuracy = (true positives + true negatives) / (total examples)**
- **Precision = (true positives) / (true positives + false positives)**
- **Recall = (true positives) / (true positives + false negatives)**
- **F_1 score = (2 * precision * recall) / (precision + recall)**

What is the classifier's F_1 score (as a value from 0 to 1)?

Enter your answer in the box below. If necessary, provide at least two values after the decimal point.

0.87

! **Incorrect**

2. **Suppose a massive dataset is available for training a learning algorithm. Training on a lot of data is likely to give good performance when two of the following conditions hold true.**

0/1 分

Which are the two?

□ We train a learning algorithm with a

large number of parameters (that is able to

learn/represent fairly complex functions).

☑ When we are willing to include high

order polynomial features of x (such as x_1^2, x_2^2,

$x_1 x_2$, etc.).

! **This should not be selected**

As we saw with neural networks, polynomial features can still be insufficient to capture the complexity of the data, especially if the features are very high-dimensional. Instead, you should use a complex model with many parameters to fit to the large training set.

□ The features x contain sufficient

information to predict y accurately. (For example, one

way to verify this is if a human expert on the domain

can confidently predict y when given only x).

☑ We train a learning algorithm with a

small number of parameters (that is thus unlikely to

overfit).

! **This should not be selected**

If the model has a small number of parameters, then it will underfit the large training set and not make good use of all the data.

3. **Suppose you have trained a logistic regression classifier which is outputing $h_\theta(x)$.**

1/1 分

Currently, you predict 1 if $h_\theta(x) \geq \mathrm{threshold}$, and predict 0 if $h_\theta(x) < \mathrm{threshold}$, where currently the threshold is set to 0.5.

Suppose you increase the threshold to 0.7. Which of the following are true? Check all that apply.

☑ The classifier is likely to now have higher precision.

✓ Correct

Increasing the threshold means more y = 0 predictions. This will decrease both true and false positives, so precision will increase.

□ The classifier is likely to have unchanged precision and recall, but higher accuracy.

□ The classifier is likely to have unchanged precision and recall, and thus the same F_1 score.

□ The classifier is likely to now have higher recall.

4. **Suppose you are working on a spam classifier, where spam emails are positive examples ($y = 1$) and non-spam emails are negative examples ($y = 0$). You have a training set of emails in which 99% of the emails are non-spam and the other 1% is spam. Which of the following statements are true? Check all that apply.**

1/1 分

□ If you always predict spam (output $y = 1$), your classifier will have a recall of 0% and precision of 99%.

☑ If you always predict non-spam (output $y = 0$), your classifier will have a recall of 0%.

✓ Correct

Since every prediction is y = 0, there will be no true positives, so recall is 0%.

☑ If you always predict spam (output $y = 1$), your classifier will have a recall of 100% and precision of 1%.

✓ Correct

Since every prediction is y = 1, there are no false negatives, so recall is 100%. Furthermore, the precision will be the fraction of examples with are positive, which is 1%.

☑ If you always predict non-spam (output $y = 0$), your classifier will have an accuracy of 99%.

✓ Correct

Since 99% of the examples are y = 0, always predicting 0 gives an accuracy of 99%. Note, however, that this is not a good spam system, as you will never catch any spam.

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

0/1 分

☑ The "error analysis" process of manually examining the examples which your algorithm got wrong can help suggest what are good steps to take (e.g., developing new features) to improve your algorithm's performance.

✓ Correct

This process of error analysis is crucial in developing high performance learning systems, as the space of possible improvements to your system is very large, and it gives you direction about what to work on next.

□ After training a logistic regression classifier, you **must** use 0.5 as your threshold for predicting whether an example is positive or negative.

☑ Using a **very large** training set makes it unlikely for model to overfit the training data.

✓ **Correct**

A sufficiently large training set will not be overfit, as the model cannot overfit some of the examples without doing poorly on the others.

□ It is a good idea to spend a lot of time collecting a **large** amount of data before building your first version of a learning algorithm.

☑ If your model is underfitting the training set, then obtaining more data is likely to help.

! **This should not be selected**

If the model is underfitting the training data, it has not captured the information in the examples you already have. Adding further examples will not help any more.