

! This quiz has been regraded; your score was not affected.

Quiz 1

Due Sep 11 at 2:09pm

Points 10

Questions 5

Available until Sep 11 at 2:09pm

Time Limit 7 Minutes

This quiz was locked Sep 11 at 2:09pm.

Attempt History

	Attempt	Time	Score	Regraded
LATEST	Attempt 1	6 minutes	8 out of 10	8 out of 10

Score for this quiz: **8** out of 10

Submitted Sep 11 at 2:09pm

This attempt took 6 minutes.

Question 1

Original Score: 2 / 2 pts **Regraded Score: 2 / 2 pts**

! This question has been regraded.

Suppose we are using linear regression to predict y using two features x_1 and x_2 . If we include an additional feature x_3 and run the regression again, which of the following observations is possible

☒ The R-square for the regression will either stay the same or increase.

☐ The adjusted R^2 for the regression will either stay the same or increase.

☐ Both.

☐ None of the two.

You Answered

Correct Answer

Question 2**0 / 2 pts**

Consider the problem of fitting polynomial models on a fixed training set and evaluating their performance on a fixed test set. In particular, let us fit polynomial models from degrees 0 to 20 on the same training set and plot the expected training mean square error against the degree of the model. Similarly, for evaluation, we use a fixed testing set and plot the expected testing mean square error against the degree of the model. Which of the following observations must be true for our plots?

You Answered

☒ The Expected Mean square error on the training data is non-decreasing

Correct Answer

☐ The Expected Mean square error on the training data is non-increasing☐ The Expected Mean square error on the testing data is non-increasing☐ The Expected Mean square error on the testing data is non-decreasing**Question 3****2 / 2 pts**

For Lasso regression, if the regularization tuning parameter λ is set to a high value, which of the following is true:

Correct!

☐ The loss function stays the same as the OLS loss function.☒ It tends to drive some parameters (weights) to zero.☐ It will always yield a higher MSE than the corresponding unregularized model.☐ It will yield a lower MSE than the corresponding unregularized model.**Question 4****2 / 2 pts**

The maximum likelihood principle is used to (select the best response):

☐

Determine which dataset a given model is most likely to generate (among a selection of datasets).

☐

Determine if a dataset has been generated by a Gaussian distribution or not.

Correct!

☒

Which model parameters are most likely to have generated an observed dataset.

☐

Compare different types of models (e.g. neural networks versus decision trees) in terms of their suitability for a given prediction problem with associated dataset.

Question 5

2 / 2 pts

The true loss/error (aka Generalization Error) for a given problem is defined with respect to which dataset or data distribution?

Your Answer:

The true loss/error (also known as Generalization Error) for a given problem is defined with respect to the entire data distribution from which the samples are drawn. This data distribution represents the universe of possible data points for the given problem.

In machine learning and statistics, we often work with a sample of data (training set, validation set, test set) drawn from this larger distribution. The goal is to generalize well to new, unseen data points from this distribution.

In summary, the Generalization Error is defined with respect to the entire data distribution of the problem, not just a specific dataset.

Quiz Score: **8** out of 10