Chapter 9 Concept Test

Due May 20 at 12pm **Points** 1 **Questions** 3 **Time Limit** None
Allowed Attempts Unlimited

Instructions

Support Vector Machines

Take this test after reading chapter 9 and completing the other pre-class activities.

Take the Quiz Again

Attempt History

	Attempt	Time	Score
LATEST	Attempt 1	11 minutes	0 out of 1 *

* Some questions not yet graded

Correct answers are hidden.

Score for this attempt: **0** out of 1 *
Submitted May 20 at 9:19am
This attempt took 11 minutes.

Question 1 — 0 / 0 pts

Consider the logistic regression prediction formula (4.2, page 132) versus the simple hyperplane-based decision boundary formula (9.2, page 338 & 9.6 & 9.7 on page 340). Both logistic regression and the maximal margin classifier use a set of beta coefficients in their formulas. Suppose both models were fit on training data for a classification problem and the betas were determined for each model separately. Now a new p-dimensional datapoint (x) is to be classified. If the datapoint is on the decision boundary (where we are equally likely to call it one class or the other class) what is the difference between the value generated by the logistic regression prediction and the value resulting from the hyperplane-based prediction?

In both predictions, the point will yield a value of 0.

In both predictions, the point will yield a value of 0.5.

If the point is on the decision boundary in logistic regression, it will yield a value of 0.5; in the hyperplane prediction method it will yield a value of 0.

If the point is on the decision boundary in logistic regression, it will yield a value of 0; in the hyperplane prediction method it will yield a value of 0.5.

Logistic regression will yield a value between 0 and 1 where 0.5 is often used to represent the notion that either class is equi-probable. In the hyperplane classifier, points will yield values which are positive, negative, or zero - with zero being on the decision boundary.

Question 2

0 / 0 pts

Consider altering a single training datapoint and its effect on model fit of a logistic regression model versus the effect on model fit of a Support vector classification model (section 9.2, page 344-349)

Examine figure 9.6-left panel and consider the training data points 1-10. Explain what would happen to both the logistic regression classifier (LRC) and to the support vector classifier (SVC) if the X2 feature value of training data point number 4 was altered and the model was refit to the revised training data:

- If point 4's X2 was set to +1 then the SVC model parameters would change and the LRC model parameters would change
- If point 4's X2 was set to +1 then the parameters for neither the LRC nor the SVC model would change
- If point 4's X2 was set to +1 then the SVC model parameters would not change but the LRC model parameters would change
- If point 4's X2 was set to +1 then the LRC model parameters would not change but the SVC model would change

Changing a value of any training datapoint will change the values of LRC since it considers all training points when fitting a model. If, when a point is altered in SVC, it becomes a support vector, then it will change the model parameters. If X2 is set to +1, then it will be in the margin of the SVC model, and the model parameters will change.

Question 3

Not yet graded / 1 pts

Please answer the following question in text form. Be specific - wherever possible, include page numbers, filenames, concept names to help your instructor understand what you are referring to: What was the most confusing aspect of the material you reviewed?

Your Answer:

Why the kernel function only needs to calculate on n choose 2 points.

Quiz Score: **0** out of 1