2. Review and the Lambda parameter

Exercises due Sep 30, 2020 05:29 IST *Completed*

Introduction and Review

Start of transcript. Skip to the end.

Welcome back.

This is machine learning lecture number four.

Last time, we talked about how to formulate maximum margin

linear classification as an optimization problem.

Today, we're going to try to understand

0:00 / 0:00 1.25x

Video
Download video file

Transcripts
Download SubRip (.srt) file
Download Text (.txt) file

Distance from a line to a point in terms of components

1.0/1 point (graded)

In a 2 dimensional space, a line L is given by $L: ax + by + c = 0$, and a point P is given by $P = (x_0, y_0)$. What is d, the shortest distance between L and P? Express d in terms of a, b, c, x_0, y_0.

(a*x_0+b*y_0+c)/sqrt(a^:

STANDARD NOTATION

Submit You have used 1 of 3 attempts

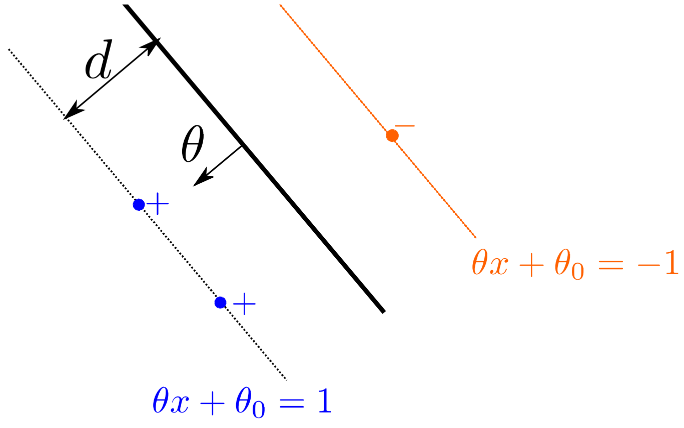
Varying Lambda in the Geometric Sense

1/1 point (graded)

Remember that the objective

$$J(\theta, \theta_0) = \frac{1}{n}\sum_{i=1}^{n} \text{Loss}_h\left(y^{(i)}\left(\theta \cdot x^{(i)} + \theta_0\right)\right) + \frac{\lambda}{2} \,||\, \theta \,||^2.$$

In the picture below, what happens to d, the distance between the decision boundary and the margin boundary, as we increase λ?



- d decreases
- d increases
- d converges to λ

Hint: You can answer with your intuition in this question. To see whether d converges to λ, think of a simple setting where we are working in 1 dimension with just two points with labels $x_1 = -1, x_2 = 2, y_1 = -1, y_2 = 1$ and assume that λ is large enough where it dominates the loss function and pushes θ close enough to 0 where all points are margin violators.

Submit You have used 1 of 2 attempts

Discussion

Hide Discussion

Topic: Unit 1 Linear Classifiers and Generalizations (2 weeks):Lecture 4. Linear Classification and Generalization / 2. Review and the Lambda parameter

Add a Post

Show all posts by recent activity

I am unable to figure out how to enter subscripts in standard notation. Can anyone help? Thanks!

- Does anybody write a summary? — 2
  Is anybody writing a summary for this course and would like to upload it? Or do you know any existing summaries or scripts?
- How to use the objective function formula in the given example? — 7
- [Staff] Maybe a bit incorrect grader in the qustion 1 — 1
  I have got hte correct answer, but actually afterwards I have realized that I missed the absolute value in the nominator. According to ...
- The first question is not visible. — 1
  I was unable to submit the solution to the first solution. After reloading the page, this was there: "Could not format HTML for proble...
- could not parse — 4
  When trying to submit the first question I get "Invalid Input: Could not parse \'....\' as a formula
- First question not loading. (Could not format HTML for problem) — 5
  it shows: Could not format HTML for problem. Contact course staff in the discussion forum for assistance. I tried to restart my brows...
- [STAFF] Will the slides from all lectures be made available? — 3
  Per title.
- Grader not showing the correct progress — 4
  Staff, Please note that grader is not showing proper marks in the progress for lecture 4 finger exercise. regards
- Signed or Absolute distance?