

VC dimension, shattering, breakpoint

- Calculate the breakpoint and VC dimension of a 2D rectangle binary classifier

Logistic Regression

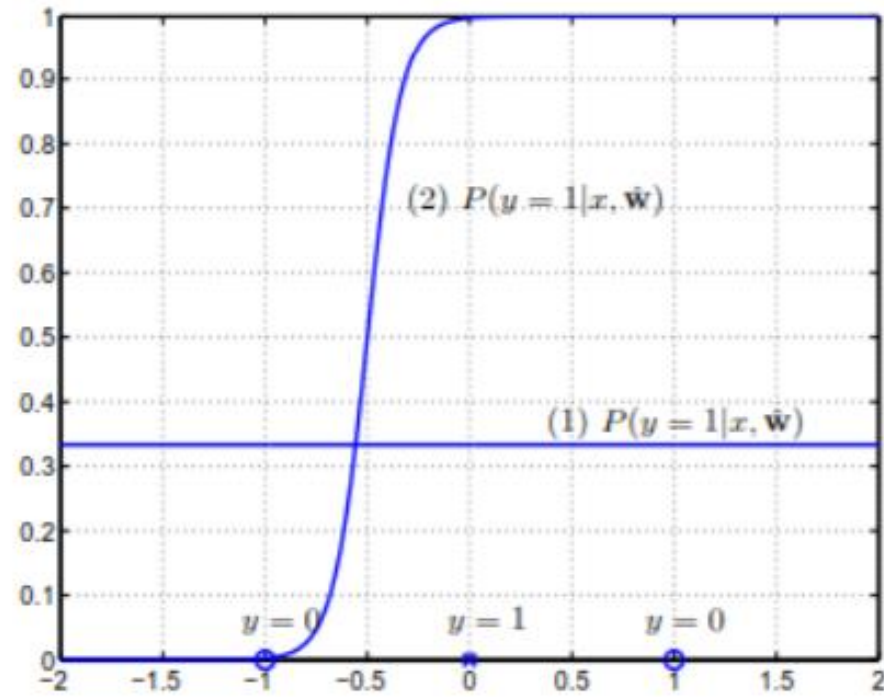
9. (4) Consider a simple one dimensional logistic regression model:

$$P(y = 1|x, \mathbf{w}) = g(w_0 + w_1x)$$

where $g(z) = \frac{1}{1+e^{-z}}$ is the logistic function.

A, What is the number of classification errors for each conditional given the labeled examples in the figure?

B, Which one of the conditionals corresponds to the maximum likelihood setting of the parameters $\hat{\mathbf{w}}$ based on the labeled data in the figure?



The figure shows two possible conditional distributions $P(y = 1|x, \mathbf{w})$, viewed as a function of x , that we can get by changing the parameters \mathbf{w} .

Multiclass

- Predict heart disease severity (0 is no disease, 1 is non severe, 2 is severe)
- Implement One vs One or One vs Rest multiclass classification using your Logistic Regression model
- Visualize class probabilities for the binary classifications and for the merged multiclass classification as well
- Bonus
 - Implement balanced classification accuracy

Multiclass (Homework)

- Standardize and split data into training and test sets
- Implement softmax error
- Implement softmax error gradient
- Rewrite Logistic Regression to handle multiclass error
- Visualize accuracy as a function of training iterations for the training and test set as well
- Visualize decision boundaries