Text, letter

Description automatically generated

Yuichi Hamamoto

Text

Description automatically generated with low confidence

1. Find the equation for the LDA boundary between Y = +1 and Y = +2.

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1. Find the equation for the LDA boundary between Y = +1 and Y = +3.

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1. Find the equation for the LDA boundary between Y = +2 and Y = +3.

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1. Make a plot with x1 along horizontal axis, x2 along vertical axis and draw each of the LDA boundaries you found. For each region, write the class label (e.g. “+2”) that would be chosen for a new sample that appeared in that region.



x2

**+1**



x1

0

**+2**



**+3**



x2 = -x1



1. If you wanted to use Naive Bayes in addition to LDA (thus still assuming Gaussianity) for this problem, explain what would change (if anything).

In case the features are not independent, then the result could be bad.

Text

Description automatically generated

P(The team makes it to the playoffs) = 0.3

P(The team does not make it to the playoffs) = 0.7

Distribution of whether the rugby team makes it to the playoffs: X~N(30,)

Distribution of whether the rugby team does not make it to the playoffs: X~N(15, )

∴P(Score 20 points | Finish in playoffs)

= X~N(30,)

=

= 0.020755371

Similarly,

P(Score 20 points | Not finish in playoffs) = X~N(15,)

=

= 0.038151055

∵bayes theorem

Aside: P(Scores 20 points)

= 0.020755371 \* 0.3 + 0.038151055 \* 0.7

= 0.03293235

P(The team makes it to the playoffs | Scores 20 points)

= (P(Scores 20 points The team makes it to the playoffs)\*P(The team makes it to the playoffs)) / P(Scores 20 points)

(0.020755371 \* 0.3) / 0.03293235 = 0.18907279

∴The probability is 18.9%