

# Spring 2016

## Problem 4

- (4.1) (4 points) Figure 1 shows the ‘two-corners’ dataset. It is clear that the two classes (marked with ‘+’ and ‘∇’) are not linearly separable.

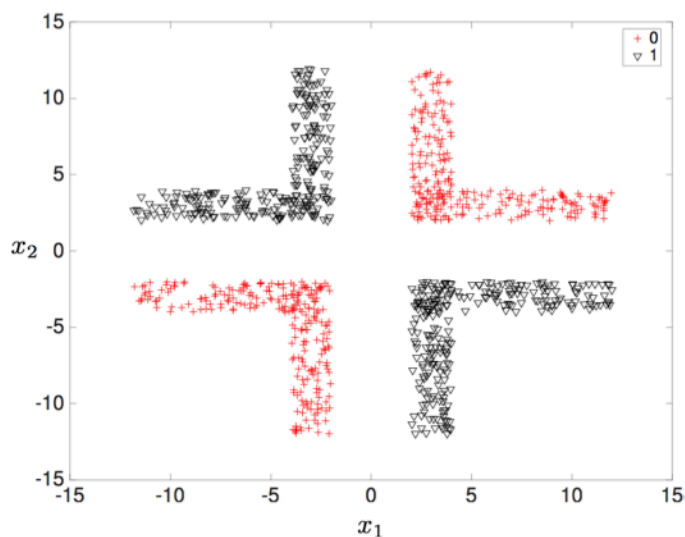


Figure 1: Two-corners dataset

The points labeled ‘+’ live in the first and third quadrants, whereas the ‘∇’ points live in the second and fourth quadrants. Perhaps we can make them separable if we introduce non-linear coordinates. We list a few possible choices below. Mark all the choices that would make this data linearly separable

- (a) ☐  $[x_1, x_2, x_1x_2]$
- (b) ☐  $[x_1^2, x_2^2, \frac{x_1+x_2}{2}]$
- (c) ☐  $[x_1, x_2, \tanh(x_1 + x_2)]$
- (d) ☐  $[x_1 + x_2, x_1x_2, 1]$