

Final - 12-13

- similar to midterm
- cumulative
- 1 page notes, 2-sided
- practice problems in advance

e.g. Logistic Regression

given  $\hat{\beta}_0, \hat{\beta}_1, X$ , compute  $P(Y=1|X)$

## LDA

Get linear decision boundaries between categories  
learn  $P(X|Y)$  - distribution of  $X$  in each of the categories of  $Y$

$X \sim$  Multivariate Normal Distribution

different means for each group

Some  $\sigma$ 's,  $\rho$  for each group  $\rightarrow$   $MVN(\mu_k, \Sigma)$

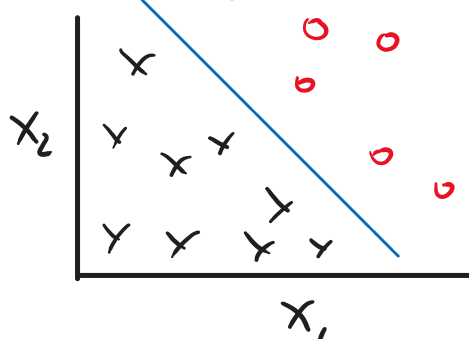
same for  
all  $k$



Logistic Regression doesn't work if  
separate data

$p=2$

$k=2$



LDA ✓

LR ✗

## Regression Tree

$p=1$

data =  $\begin{pmatrix} x_1, y_1 \\ x_2, y_2 \\ \vdots \end{pmatrix}$

want  $f(x)$  = predicts  $Y$   
at value of  $x$

$$f(x) = \hat{\beta}_0 + \hat{\beta}_1 x$$

$\hat{f}(x)$  at node = mean of  $Y$ 's in that node

