

## Week 3: Classification

### LOGISTIC REGRESSION

Recall classification examples:

- Spam detection
- fraudulent transactions
- malignant tumors

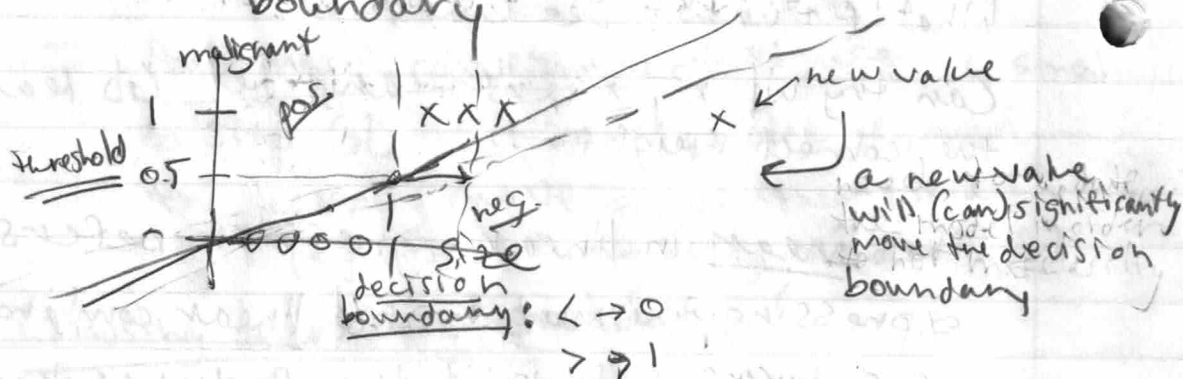
binary: yes or no  
(pos. class) (neg. class)

(Note: classes = categories)

Linear regression?

- Predicts a continuous line of numerical values.
- Pick some threshold?

→ With one additional value you might need to drastically change the decision boundary



- Can work, but often not well!

### Logistic regression

- Most used alg. for classification.
- Fits an S-shaped curve b/w 0 and 1.
- Predicts probabilities.

Sigmoid function is a class of mathematical fn. that always outputs b/w 0 and 1.

$$\text{Eg. } g(z) = \frac{1}{1 + e^{-z}} \quad \lim_{z \rightarrow \infty} g(z) = 1 \quad \lim_{z \rightarrow -\infty} g(z) = 0$$

