GENERAL ASSEMBLY

DATA SCIENCE

CONFUSION MATRIX

Confusion Matrix: table to describe the performance of a classifier

n=165	Predicted: NO	Predicted: YES
Actual: NO	50	10
Actual: YES	5	100

Example: Test for presence of disease
NO = negative test = False = 0
YES = positive test = True = 1

- How many classes are there?
- How many patients?
- How many times is disease predicted?
- How many patients actually have the disease?

n=165	Predicted: NO	Predicted: YES	
Actual: NO	TN = 50	FP = 10	60
Actual: YES	FN = 5	TP = 100	105
	55	110	

Accuracy:

- Overall, how often is it correct?
- (TP + TN) / total = 150/165 = 0.91

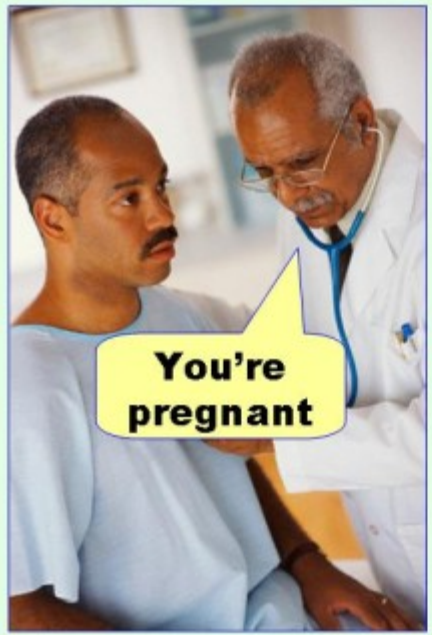
Basic Terminology:

- True Positives (TP)
- True Negatives (TN)
- False Positives (FP)
- False Negatives (FN)

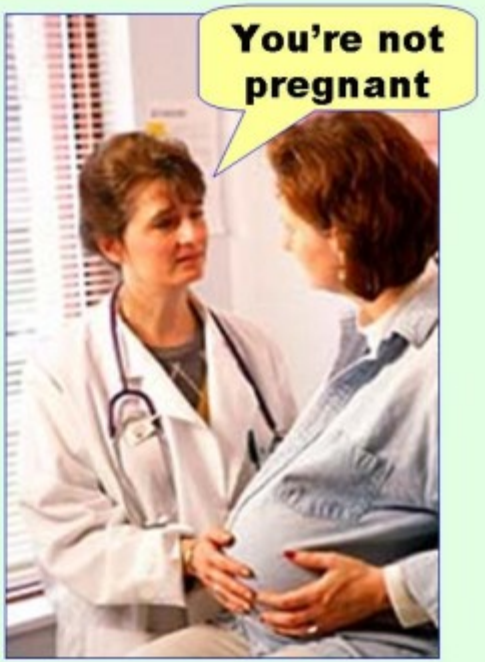
Misclassification Rate (Error Rate):

- Overall, how often is it wrong?
- (FP + FN) / total = 15/165 = 0.09

Type I error
(false positive)



Type II error
(false negative)



CONFUSION MATRIX

n=165	Predicted: NO	Predicted: YES	
Actual: NO	TN = 50	FP = 10	60
Actual: YES	FN = 5	TP = 100	105
	55	110	

Sensitivity:

- When actual value is positive, how often is prediction correct?
- TP / actual yes = 100/105 = 0.95
- "True Positive Rate" or "Recall"

False Positive Rate:

- When actual value is negative, how often is prediction wrong?
- FP / actual no = 10/60 = 0.17

Specificity:

- When actual value is negative, how often is prediction correct?
- TN / actual no = 50/60 = 0.83