Testing Models

prediction (eg, via regression) versus classification:

REGRESSION AND CLASSIFICATION

Regression returns a numeric value

Classification returns a state

Regression

Classification

WHICH MODEL IS BETTER?

Overfitting
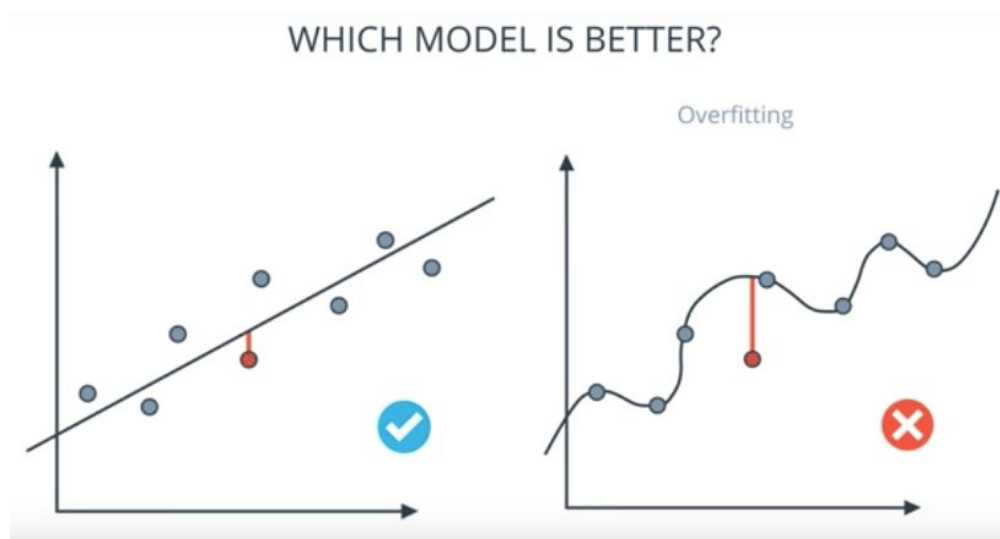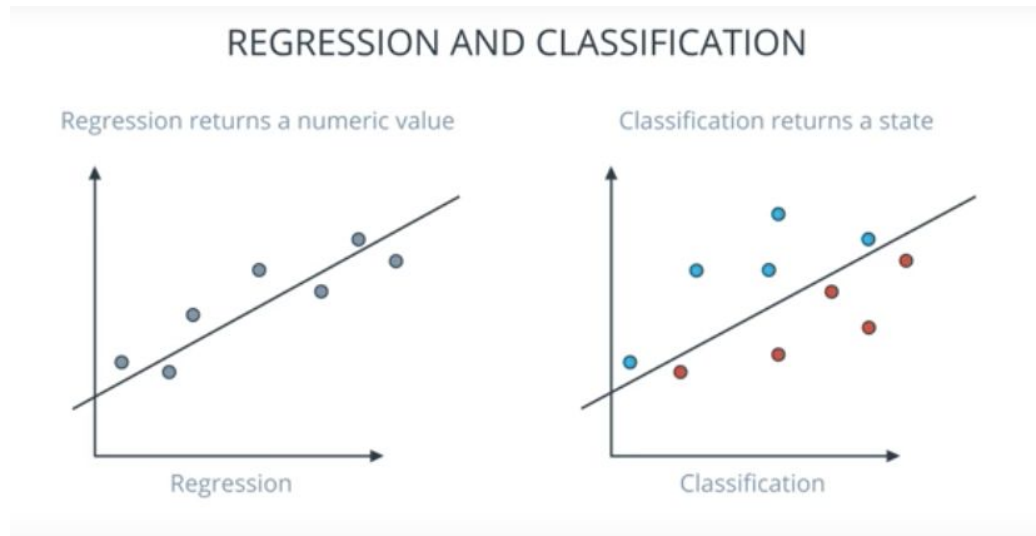
Evaluation metrics

The basis for the evaluation metrics is the socalled confusion matrix (video)

Confusion Matrix

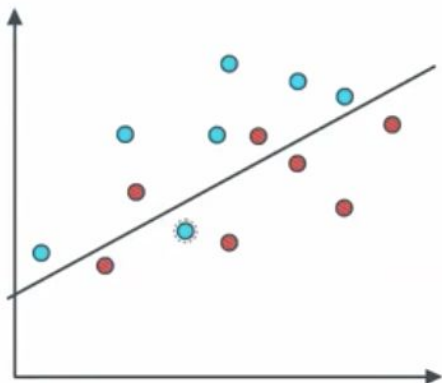**MEDICAL MODEL**

	Diagnosed Sick	Diagnosed Healthy
Sick	True Positive	False Negative
Healthy	False Positive	True Negative

example (quiz):

CONFUSION MATRIX

	Guessed Positive	Guessed Negative
Positive	6 True Positives	1 False Negatives
Negative	2 False Positives	5 True Negatives

accuracy metric (video):
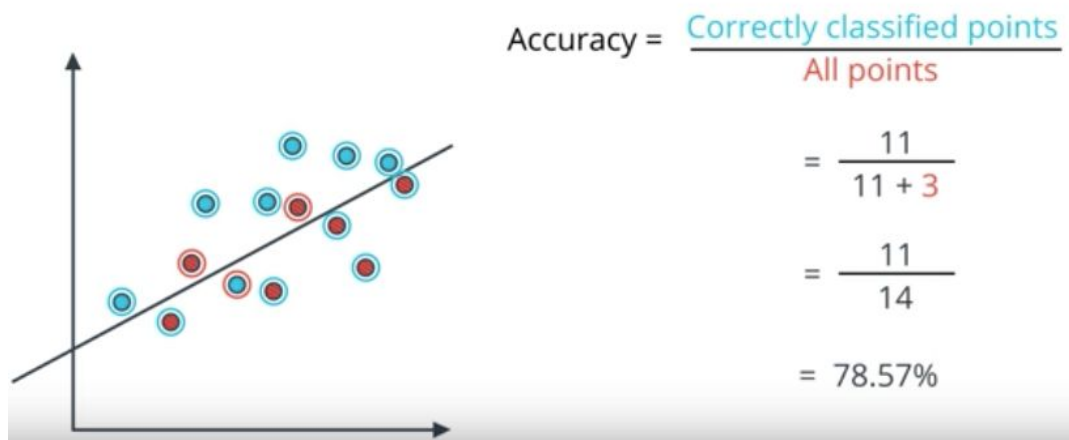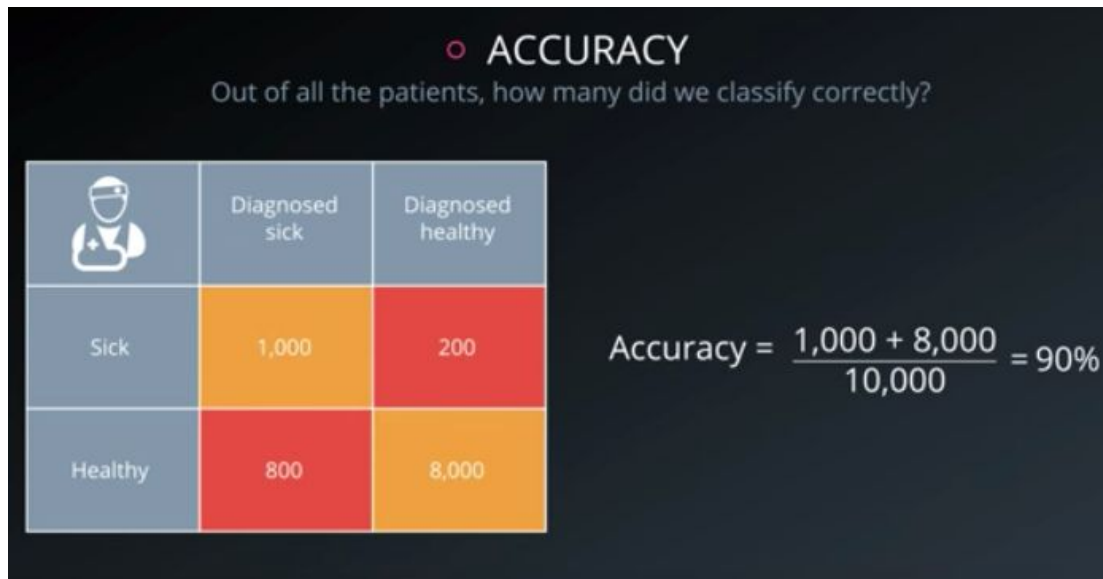
Video with examples for recall versus precision preferences

Precision ([video](#))

○ PRECISION

FOLDER

EMAIL	Sent to Spam Folder	Sent to Inbox
Spam	100	170
Not Spam	30 ⊗	700

OUT OF ALL THE E-MAILS
SENT TO THE SPAM FOLDER,
HOW MANY WERE ACTUALLY SPAM?

$$PRECISION = \frac{100}{100 + 30} = 76.9\%$$

Recall ([video](#))

○ RECALL

FOLDER

EMAIL	Sent to Spam Folder	Sent to Inbox
Spam	100	170
Not Spam	30 ⊗	700

OUT OF ALL THE SPAM E-MAILS,
HOW MANY WERE CORRECTLY
SENT TO THE SPAM FOLDER?

$$Recall = \frac{100}{100 + 170} = 37\%$$

F1 score ([video](#))

F-beta score ([video](#))