Performance Metrics + Linear Algebra

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Recap and Today

- GMM
- k-Means/GMM for Image
- Performance Metrics
- Linear Algebra (to prepare for Principal Component Analysis)

Classification Metrics

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Is this enough??

Classification Metrics

Consider the scenario where 1000 people go for X-ray to detect Covid. They also undergo RT-PCR test for the same. Assuming RT-PCR gives the result with 100% accuracy, this is what was observed, what is the accuracy??

	X-ray	Covid +ve	Covid - ve
RT-PCR			
Covid +ve		50	20
Covid -ve		80	850

Classification Metrics

Consider another scenario where 1000 people go to a magician/future teller/optimistic person to detect Covid. They also undergo RT-PCR test for the same. Assuming RT-PCR gives the result with 100% accuracy, this is what was observed, what is the accuracy now??

	X-ray	Covid +ve	Covid - ve
RT-PCR			
Covid +ve		0 2	70 68
Covid -ve		0 2	930 928

(93%)

Can we conclude that the magician is better than X-ray?

Classification Metrics

	X-ray	Covid +ve	Covid - ve
RT-PCR			
Covid +ve		True Positive(TP)	False Negative (FN)
Covid -ve		False Positive(FP)	True Negative (TN)

$$\text{Precision(P)} = \frac{\text{TP}}{\text{TP} + \text{FP}} \qquad \text{Recall(R)} = \frac{\text{TP}}{\text{TP} + \text{FN}}$$

F-1 score is the harmonic mean of Precision and Recall

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What is meant by positive and negative when we have more than 2 classes?