Error Metrics for Skewed Classes

ex. Cancer classification

$\begin{cases} y=1 & : \text{양성} \\ y=0 & : \text{음성} \end{cases}$

1% error on test (99% 정확 진단)

BUT, 0.50%만 양성이면?

모두 음성이라 예측하면

0.5% error on test 임!

∴ accuracy만으로 모델 평가 ×

Precision / Recall

		Actual 1	Actual 0
Predicted	1	TP	FP
	0	FN	TN

Precision

$TP/(TP+FP)$

* Recall

$TP/(TP+FN)$

recall = 0

※ $y=1$ in presense of rare class that we want to detect

Trading Off Precision and Recall

Logistic regression : $0 \le h_\theta(x) \le 1$

Predict 1 if $h_\theta(x) \ge n$

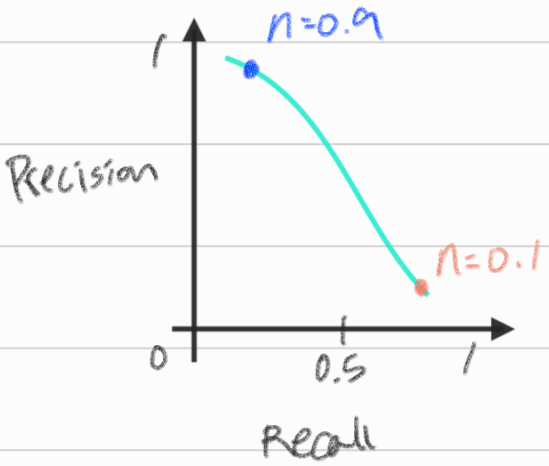
Predict 0 if $h_\theta(x) < (1-n)$

(웬만하면 양성 판정)

n이 높으면: Higher precision, Lower recall

n이 낮으면: Lower precision, Higher recall

(조금만 의심돼도 양성판정)



Average: $\frac{P+R}{2}$ (not a good 척도)

F_1 score: $2\frac{PR}{P+R}$ (good!)

P or R = 0 이면 낮은 점수