Classifier Evaluation Metrics: Accuracy, Error Rate, Sensitivity and Specificity

A\P	C	¬C	
C	TP	FN	P
¬C	FP	TN	N
	P'	N'	All

❑ **Classifier accuracy,** or recognition rate

  ❑ Percentage of test set tuples that are correctly classified

  Accuracy = (TP + TN)/All

❑ **Error rate:** *1 – accuracy,* or

  Error rate = (FP + FN)/All

❑ **Class imbalance problem**

  ❑ One class may be *rare*

    ❑ E.g., fraud, or HIV-positive

  ❑ Significant *majority of the negative class* and minority of the positive class

  ❑ Measures handle the class imbalance problem

  ❑ **Sensitivity** (recall): True positive recognition rate

    ❑ **Sensitivity = TP/P** $=\dfrac{Pos\ ที่เห็จริง}{ผู้ว ทั้วหมด}$

  ❑ **Specificity:** True negative recognition rate

    ❑ **Specificity = TN/N** $=\dfrac{Neg\ ที่แท้จริง}{Neg\ ทั้วหมด}$

ทำนาย
จริง

	0	1
0	TP [30,	FN 6]
1	FP [2,	TN 48]

POS → Sensitivity $= TP/P = \dfrac{30}{30+6} = 0.83$

Neg → Specificity $= TN/N$
$= \dfrac{48}{2+48} = 0.96$

	precision	recall	f1-score	support
0	0.94	0.83	0.88	36
1	0.89	0.96	0.92	50
accuracy			0.91	86
macro avg	0.91	0.90	0.90	86
weighted avg	0.91	0.91	0.91	86

ให้ 0เป็น pos
ให้ 1เป็น pos

$\dfrac{30}{30+2}$ $\dfrac{30}{30+6}$ ค่าเฉลี่ย P, R

$\dfrac{48}{48+6}$ $\dfrac{48}{46+2}$

$\dfrac{48+30}{86}$

$\dfrac{0.83+0.96}{2}$

$\dfrac{(0.83\times36) + (0.96\times50)}{36+50}$

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