

= accuracy

$$\frac{45 + 35}{100} = \frac{80}{100} = 80\%$$

total value

$$\frac{99}{100} = 99\%$$

prop theory
[99] 1

Classification Report

Recall / Sensitivity / TPR
(True +ve rate)

$$\text{Recall} = \frac{\text{TP}}{\text{TP} + \text{FN}}$$

0-1

correctly classified +ve value

actual +ve value

$$\text{+ve} \Rightarrow \frac{250}{225} = 1.11$$



100 spam

$$\frac{90}{100} = 0.9$$

0.9

Recall (Pass)

$$\frac{100}{112}$$

$$= 0.89 \sim 0.9$$

Recall

$$\frac{50}{55} \frac{10}{11} = 0.9$$

R(fail)

$$\frac{15}{20} = 75\% = 0.75$$

AC	Pn	pass	fail
Pass	100	12	$\Rightarrow 112$
fail	5	1.5	

Act	Pnd	App	dec
App	50	5	
dec	3	10	

Precision

$$= \frac{TP}{TP + FP}$$

$$= \frac{100}{105}$$

P (app)

$$= \frac{50}{53}$$

100	12
5	15
App	dec
50	5
3	10
dec	



$$ML = \frac{\checkmark 1's}{\text{total } 1's}$$

pu ..

$$P_{del} = \frac{\checkmark 1's}{\text{total } 1's \text{ pred}}$$

$$\frac{10}{15} = 0.6$$

F-1 / F β score

$$\text{F1 Score} : \frac{(1 + \beta^2)}{2} (\text{Precision} \times \text{Recall})$$

$\beta < 1 \rightarrow \text{precision}$

$\beta > 1 \rightarrow \text{recall}$

$$\beta = 1$$

$$\frac{(1 + 1^2)}{2} (25 \times 99)$$

$$(1 + 1^2) \quad 2 \quad (25 \times 99)$$



$$124$$

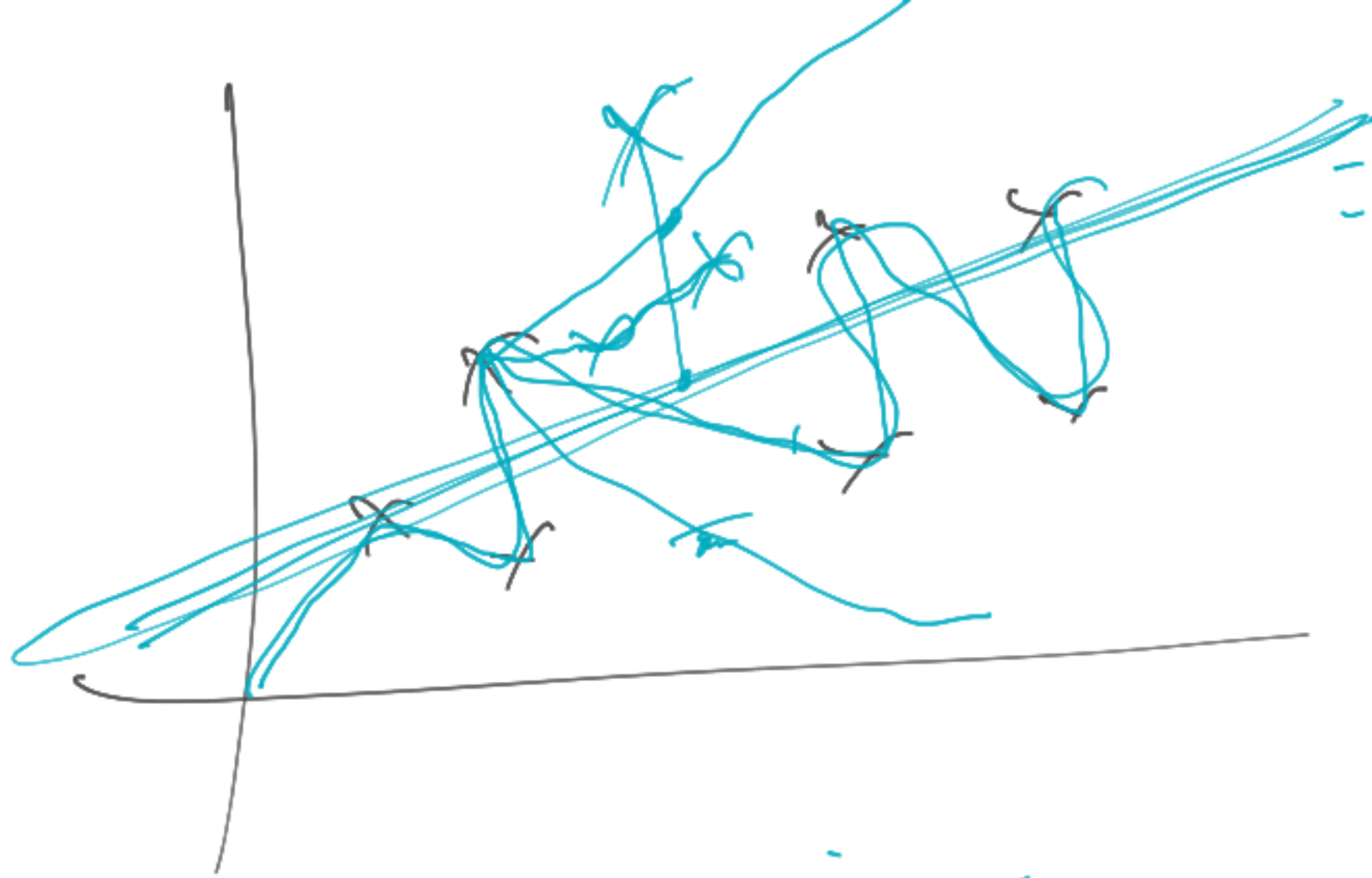
F1 score

$$F1 = \frac{(1 + \beta^2) (\text{Precision} \times \text{Recall})}{\beta^2 \times (P + R)}$$

62

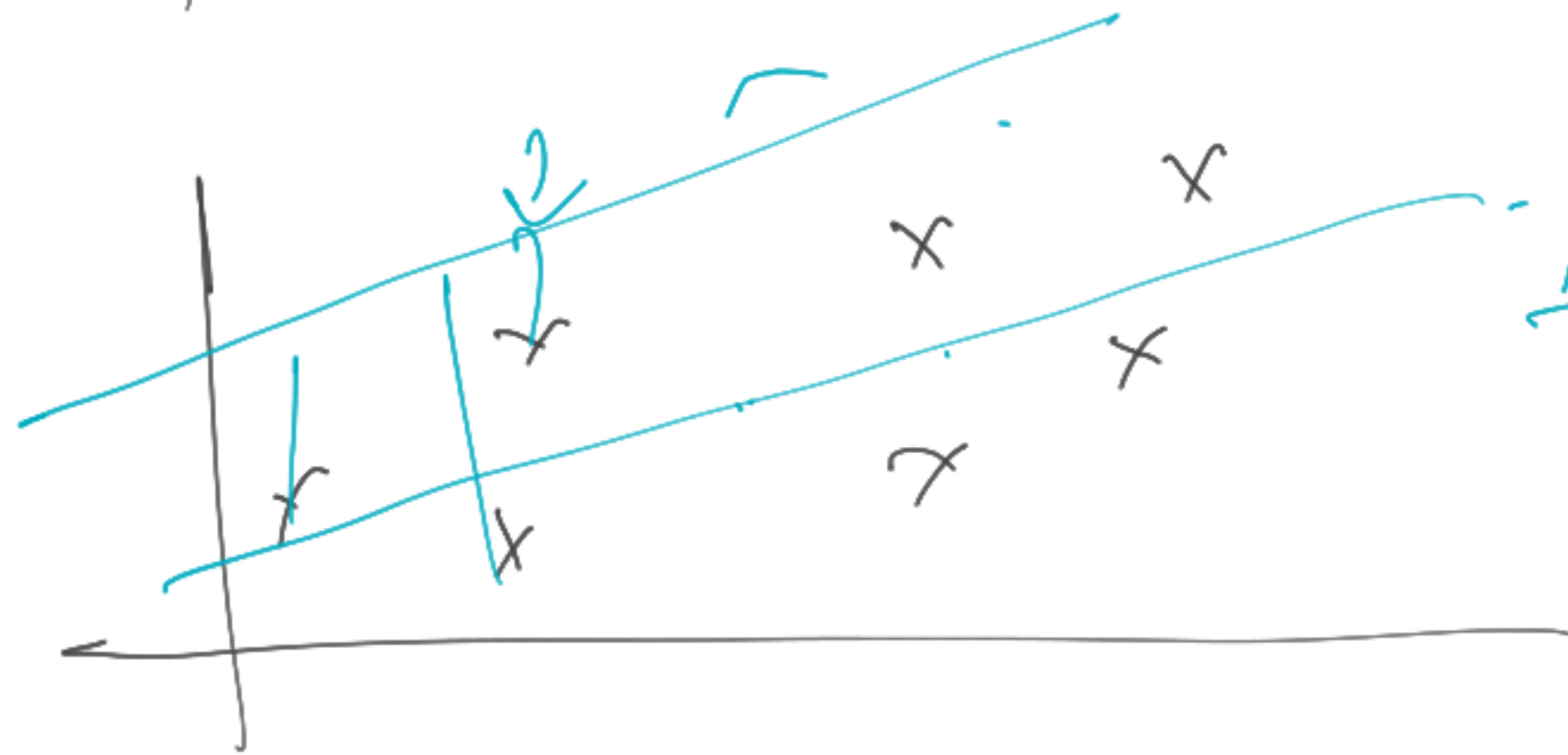
40

$$\frac{(2) (25 \times 99)}{(25 + 99)} = \frac{2 \times 25 \times 99}{124} = 39.9 \approx \underline{\underline{40}}$$



= error - 1

Overfitting : over learning



underfitting : very less learning

hard test.

Adv:

- 1) easy
- 2) works well on simple dataset
- 3) less prone to overfitting
- 4) apply regularization to overcome overfitting

Dis:

- 1) requires feature scaling
- 2) sensitive to outliers
- 3) can't be used for less amount of data

Regularization

$$\frac{1}{n} \sum_{i=1}^n (y_i - \hat{y}_i)^2 + \lambda \sum_{j=1}^p \beta_j^2$$