PAC := probability Approximately correct.

> It is a framework for the mathematical analysis of machine learning.

> The goal of PAC : with high probability, the selected hypothesis will have a lower error.

> Parameters: ε & δ

> with probability at least $(1-\delta)$, a system learn the concept with error at most ε.

> ε is upper bound on the error in accuracy (i), the hypothesis with error less than ε.
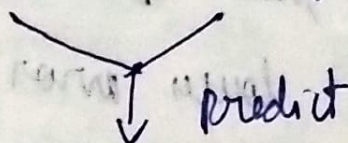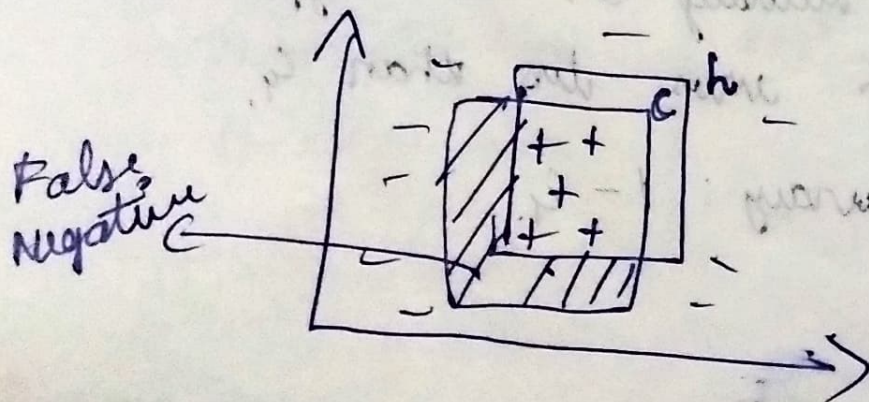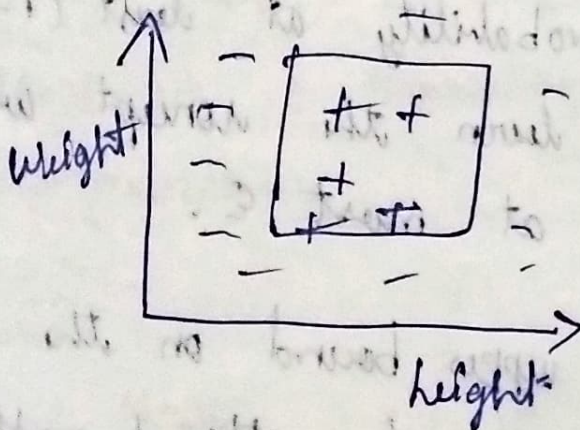
> Accuracy : $1 - \varepsilon$.

> δ gives the probability of
failure in achieving this
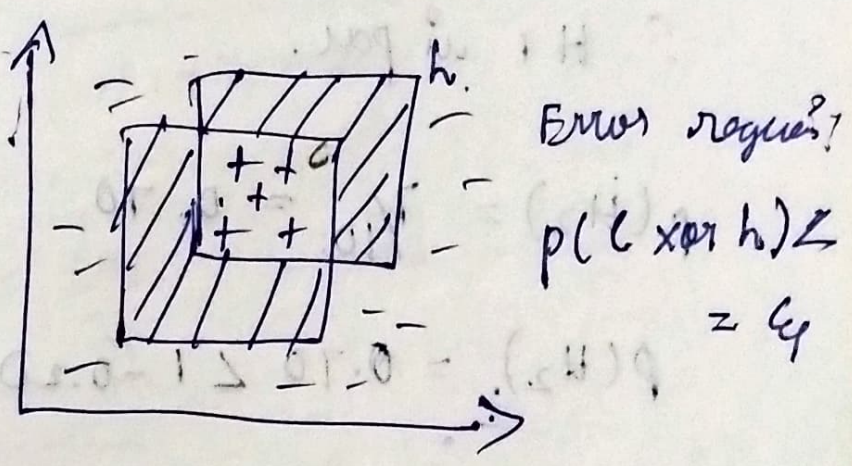accuracy δ, $(0 < \delta \leq 1)$.

Confidence : $1 - \delta$

Eg :

Height & weight

predict

Future → Medium height person as
not.

weight

height

False
Negative

g with Mi...
rect Errors as Early
...ta from Differe...

$\rightarrow$ False positive

Error required?

$$p(c \text{ xor } h) \leq$$
$$= \varepsilon$$

PAC:
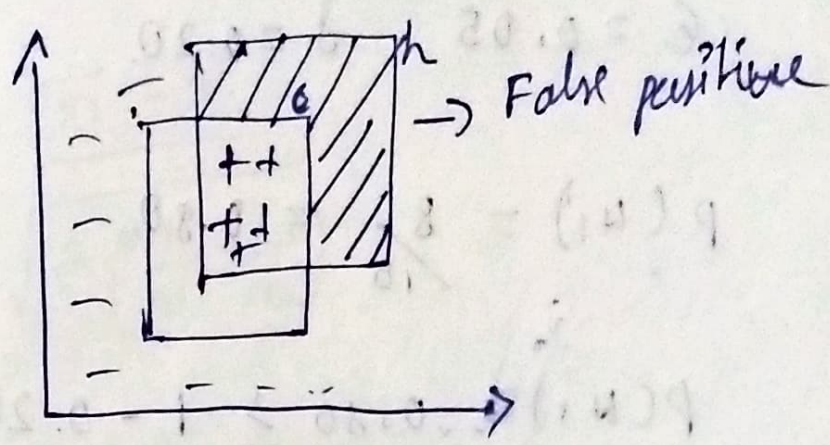
goal: $p(\text{Errors}(t) \leq \varepsilon) \geq 1 - \delta$

i.e. $p(p(c \oplus h) \leq \varepsilon) \geq 1 - \delta$

Eg:

Error (E1)		(E2)	
0.04	0.04	0.04	0.043
0.043	0.03	0.035	0.03
	⟨0.09⟩	⟨0.06⟩	0.021
	⟨0.86⟩	⟨0.058⟩	
	0.025	⟨0.55⟩	
	0.049		
	0.023	0.045	
	0.025	0.025	

$$\epsilon = 0.05 \qquad \delta = 0.20.$$

$$p(H_1) = \frac{8}{10} = 0.80.$$

$$p(H_1) = 0.80 \geq 1 - 0.20$$

∴ H_1 ủ pou.

$$p(H_2) = \frac{7}{10} = 0.70.$$

$$p(H_2) = 0.70 < 1 - 0.20$$

∴ H_2 ủ not PAC.