Supervised

(i/p, o/p)

(2) x (2) = (3)

2 x 4 = 8

Reinforcement L

m/c —action→ environment

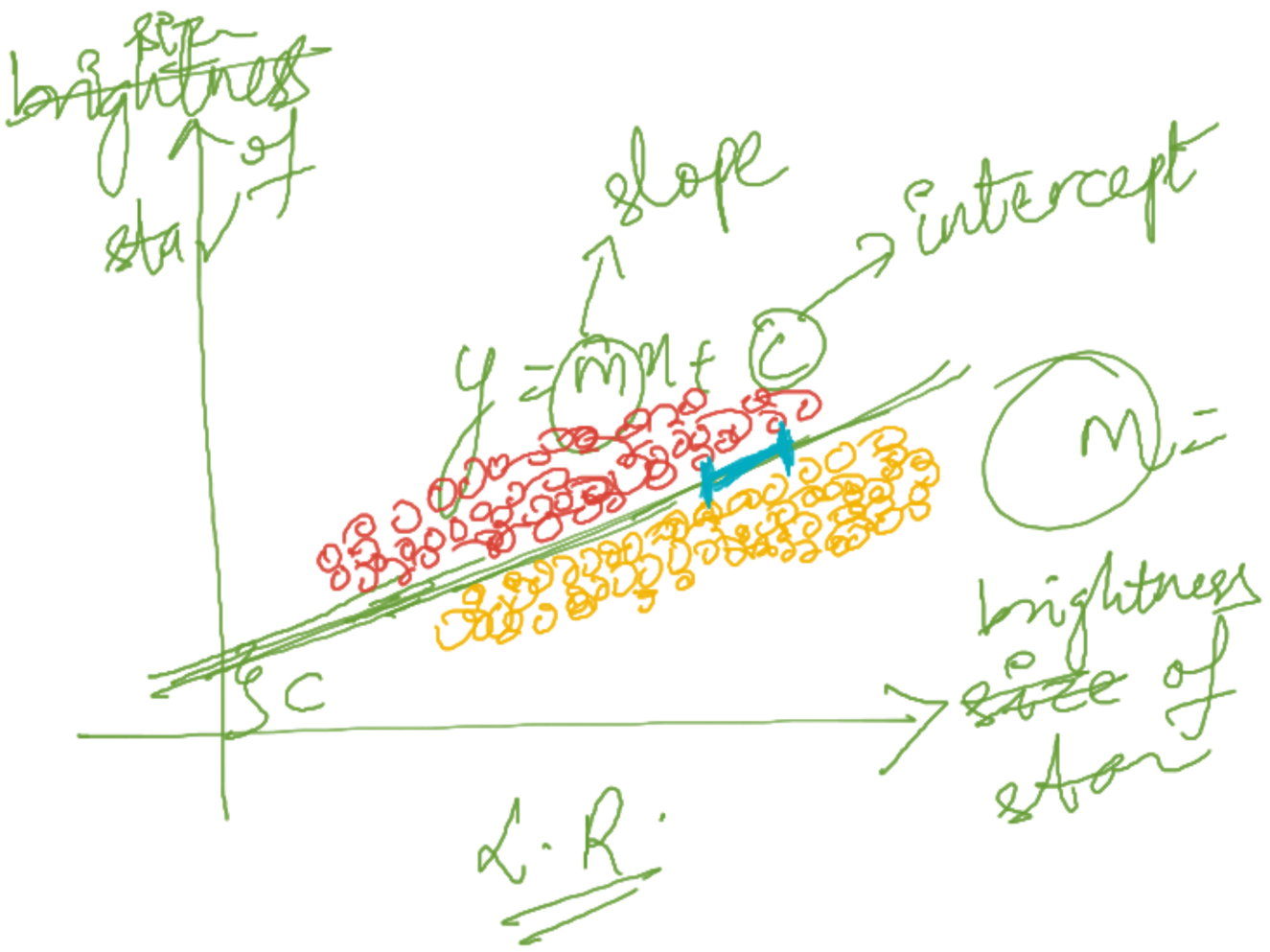
feedback

Unsupervised

pattern recognition

① Regression - continuous

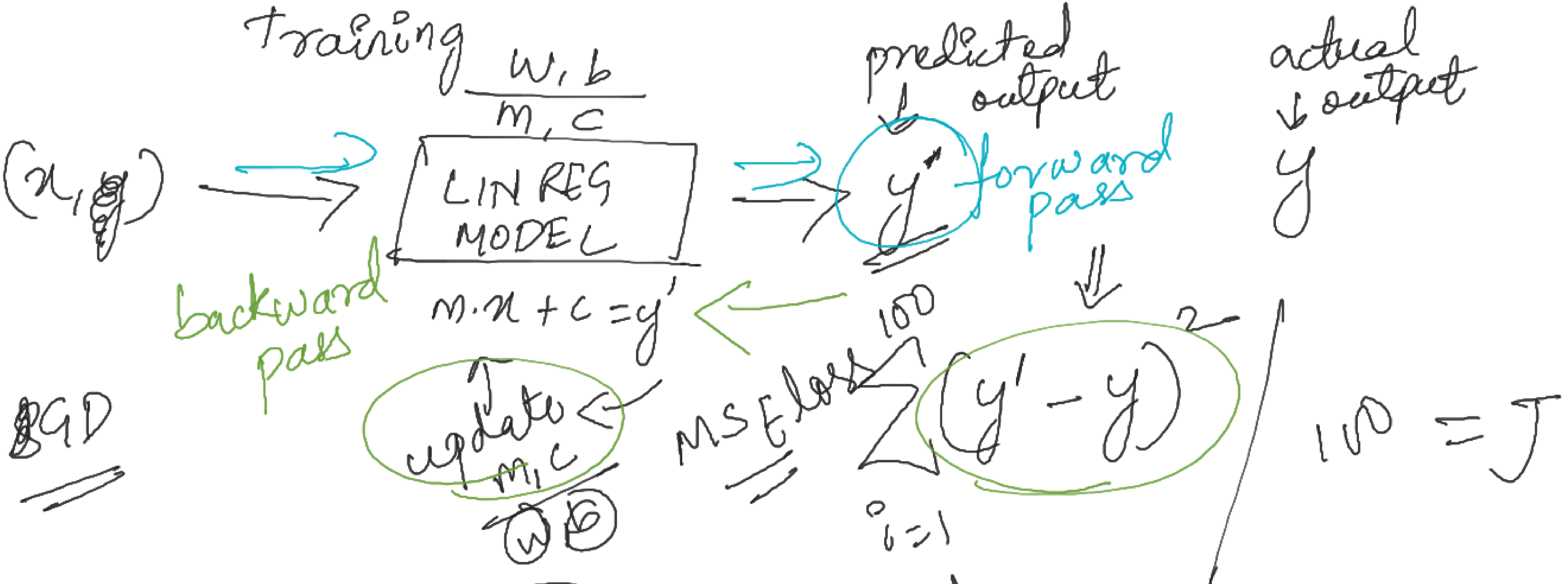
② Classification - discrete



$$m = \frac{dy}{dx} = \frac{y_2 - y_1}{x_2 - x_1}$$

$$y = mx + c$$

dep/op ind/p



$$W_{new} = W_{old} - \alpha \cdot \frac{dJ}{dW}$$

$$b_{new} = b_{old} - \alpha \cdot \frac{dJ}{db}$$

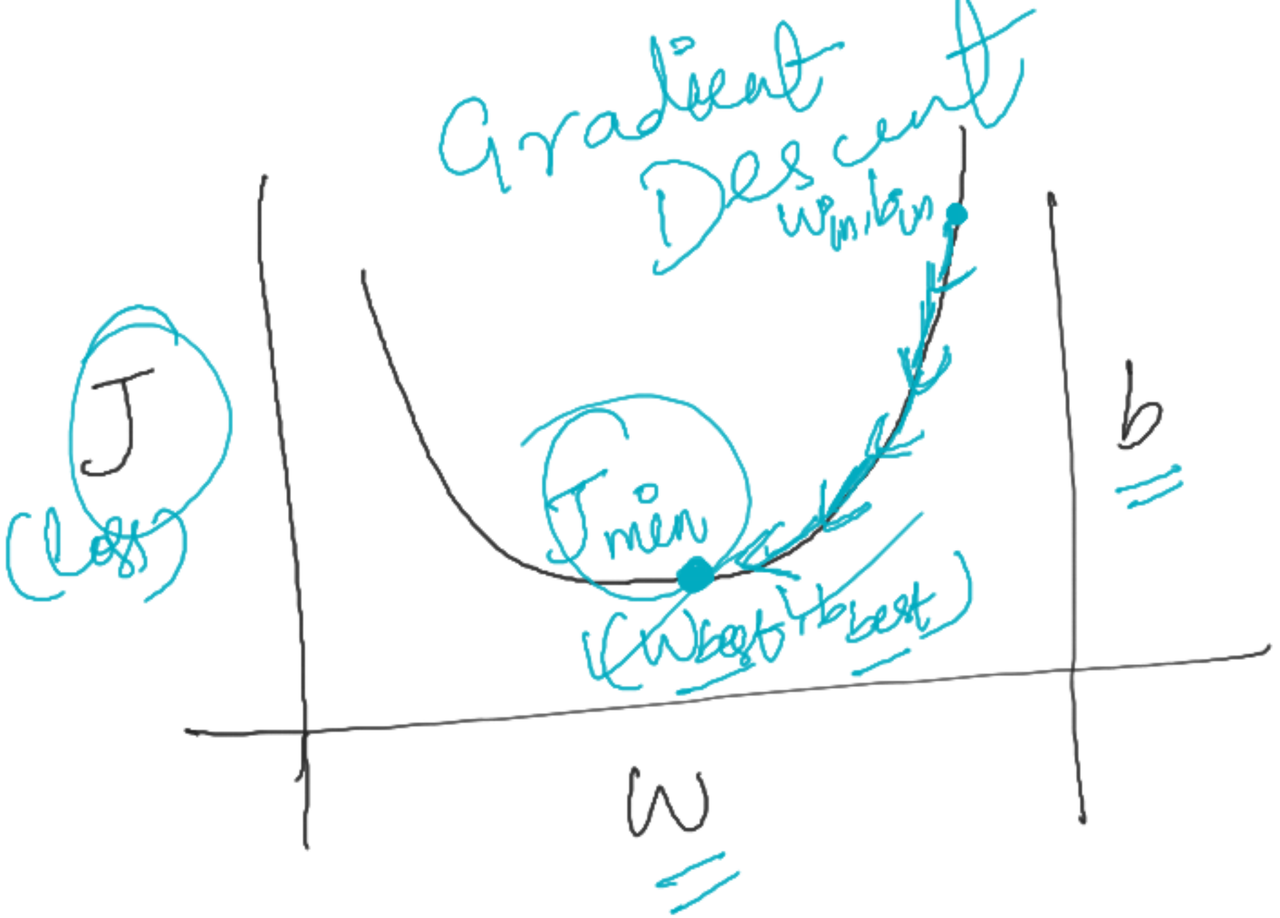
learning rate

Log likelihood loss

FP + BP = 1 iteration of training

SGD

Gradient Descent



$\frac{dJ}{dw}$ $\frac{dJ}{db}$

$$y_i' = mx_i + b$$

$$J = \sum_{i=1}^{N} \left(y_i - (mx_i + b) \right)^2 / N$$

$$\frac{dJ}{db} = 2 \cdot \left(y_i - (mx_i + b) \right) \cdot -1$$

$$\frac{dJ}{dm} = 2 \cdot \left(y_i - (mx_i + b) \right) \cdot -x_i$$