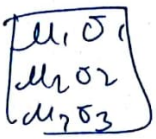
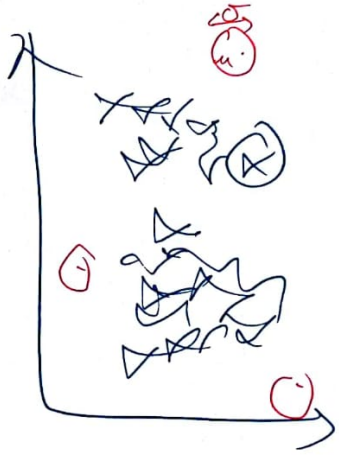
K = 2

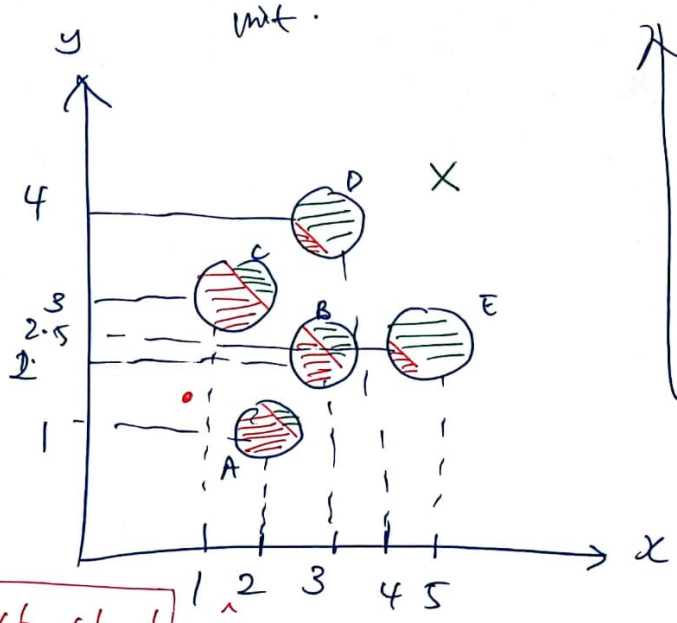
y: red, green



unit.

K is set





$\frac{2}{3}f + \frac{1}{2}f + \frac{1}{2}f + \frac{1}{3}f + \frac{1}{3}f = \hat{n}_{red}$.

Pred = $\frac{2\frac{1}{3}}{5}$

Hard labeling

ABC → $\bar{x}$: $\frac{1+2+3}{3}$, $\bar{y}$: $\frac{1+2+3}{3}$

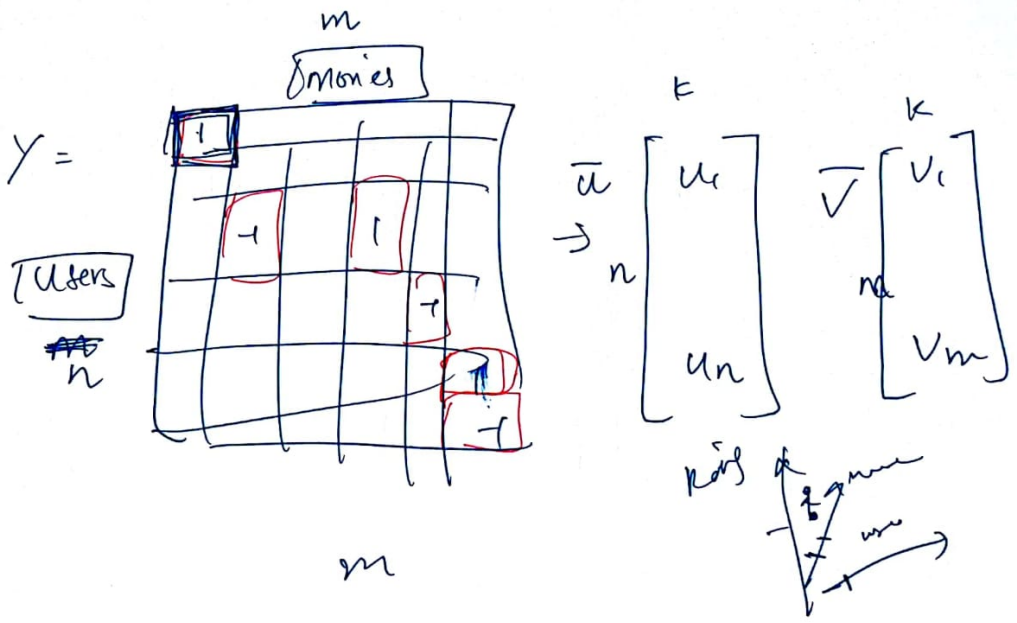
DE → $\bar{x}$: $\frac{5+4}{2}$, $\bar{y}$ = $\frac{2.5+4}{2}$

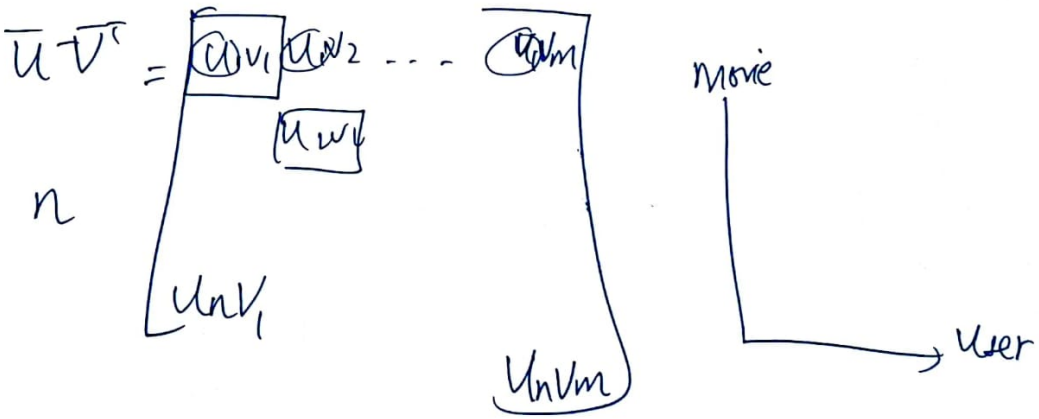
Soft labeling:

$\frac{2}{3}A, \frac{1}{2}B, \frac{1}{2}C, \frac{1}{3}E, \frac{1}{3}D$ → $\bar{x} = \frac{\frac{2}{3}\times 2 + \frac{1}{2}\times 3 + \frac{1}{2}\times 1 + \frac{1}{3}\times 5 + 4\times\frac{1}{2}}{5}$.

$\frac{1}{3}A, \frac{1}{2}B, \frac{1}{2}C, \frac{2}{3}E, \frac{2}{3}D$.

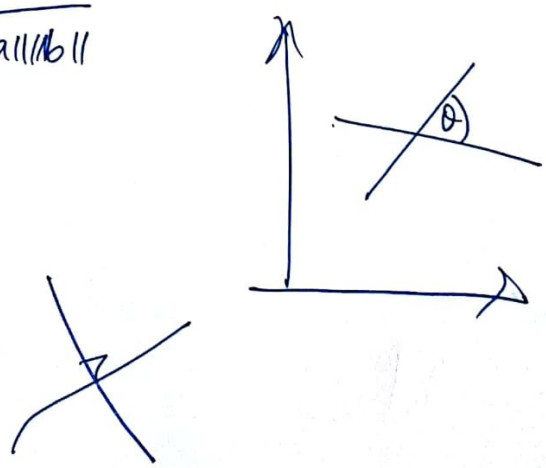
$p(y|x)$ → prob that x is in y. → 1, 2, 3



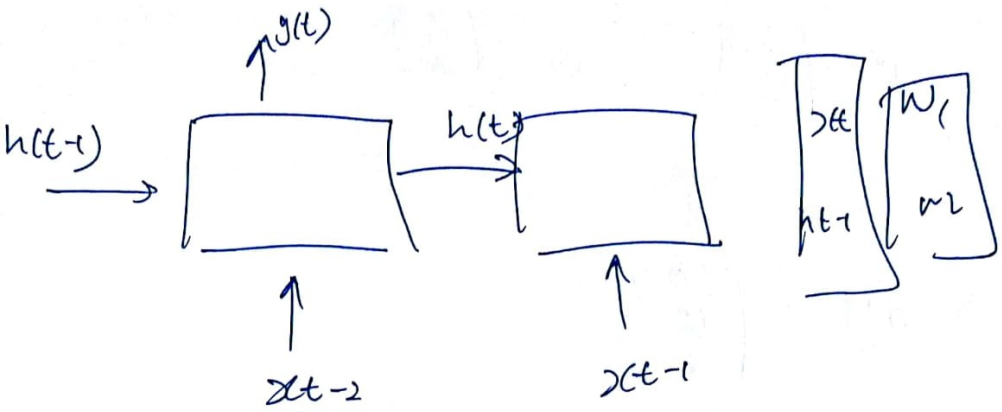


$$\text{Sim}(a,b) = \cos(\theta) = \frac{a \cdot b}{\|a\| \|b\|}$$

$$(y_{11} - u_1 v_1)^2$$

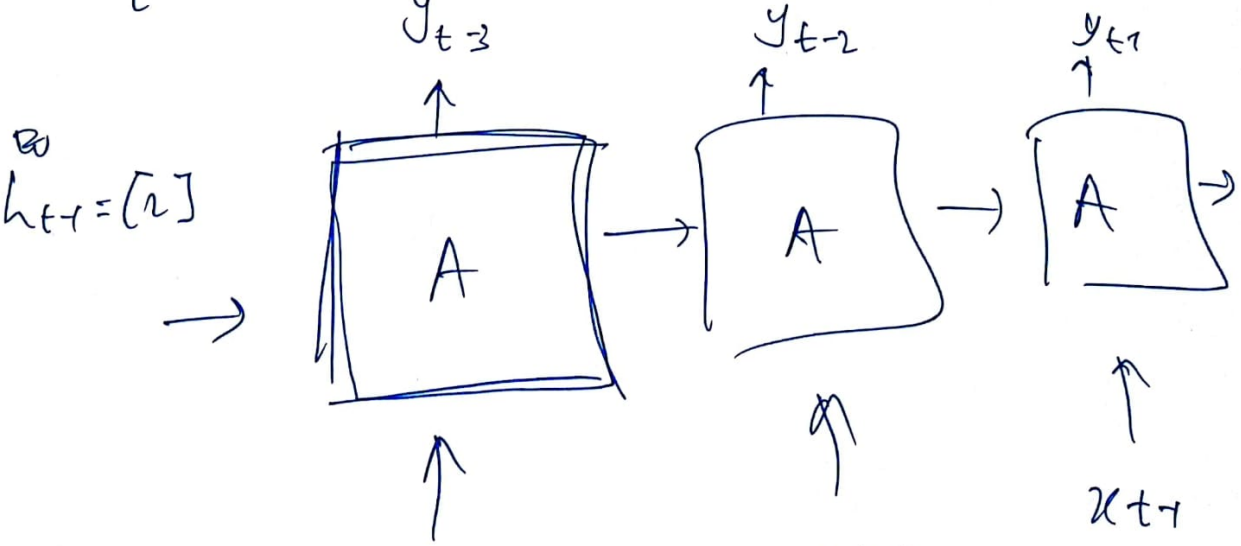


$f = \frac{1}{1 - e^{(W_1)(x_t, h_{t-1})}}$

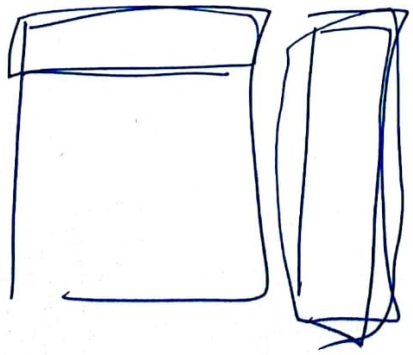


$f(x) = \frac{1}{1-e^x} \rightarrow \bar{x} = \begin{bmatrix} 2 \\ 3 \end{bmatrix}$

$x = [1]$



W

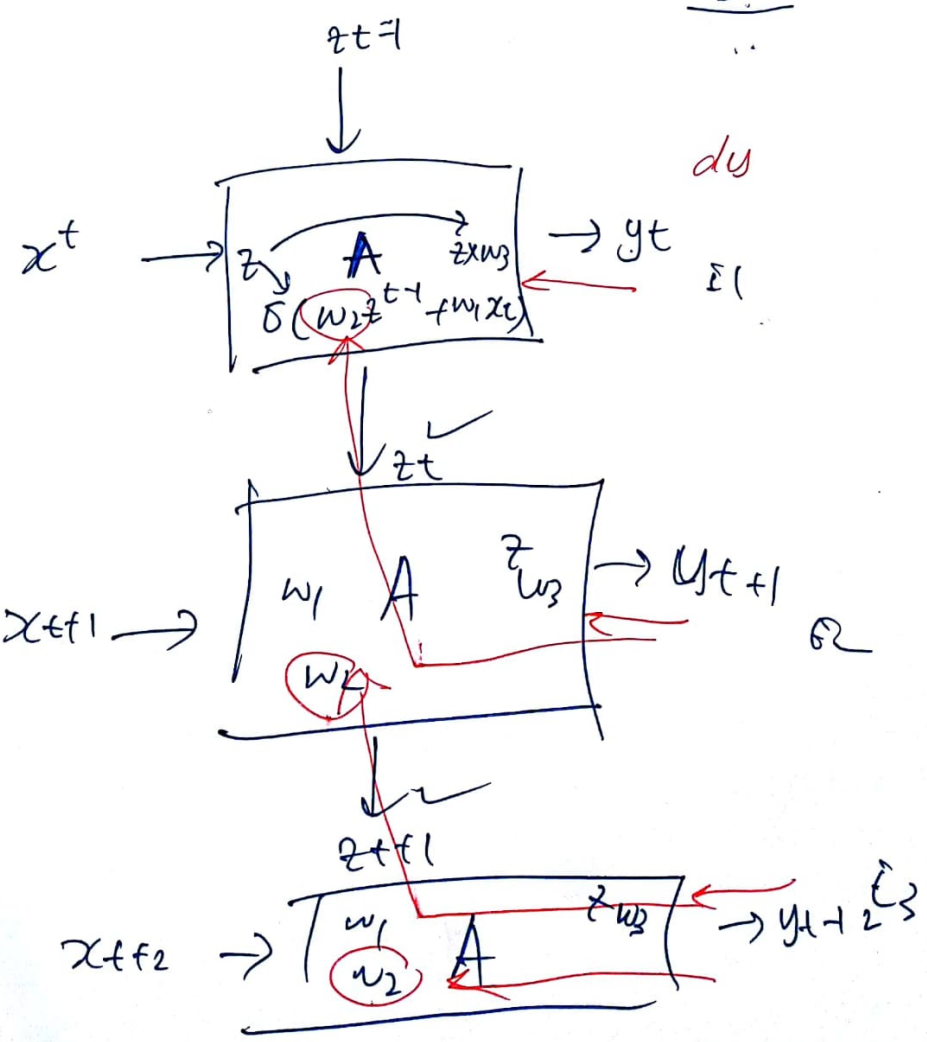


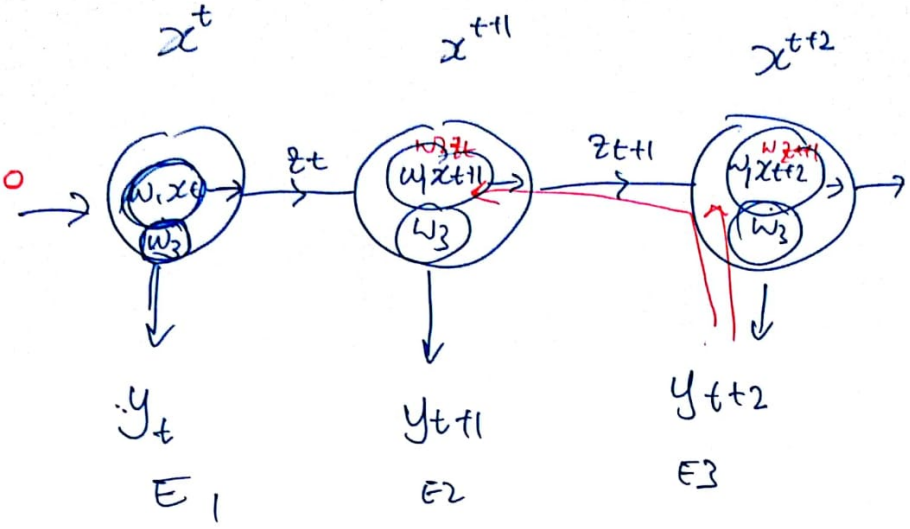
$f = \begin{bmatrix} \frac{1}{1-e^2} \\ \frac{1}{1-e^3} \end{bmatrix}$

at t = 1 → feed in x_1, I get $\hat{y}_1$
I have y_1

at t = 2 → feed in x_2 - I get $\hat{y}_2$
I have y_2

at t = 3 → feed in x_3 - I get $\hat{y}_3$
I have y_3





$\hat{y}_1 = w_3 \sigma(w_1 x_1)$ z_1

$z_1 = \sigma(w_1 x_1)$

$\frac{dE}{dw_3}$

$\hat{y}_2 = w_3 z_2$

$z_2 = \sigma(w_2 z_1 + w_1 x_2)$

$\frac{dE_1}{dy_1} \times \frac{dy_1}{dw_3}$

$+ \frac{dE_2}{dy_2} \times \frac{dy_2}{dw_3}$

$\hat{y}_3 = w_3 z_3$

$+ \frac{dE_3}{dy_3} \times \frac{dy_3}{dw_3}$

$z_3 = \sigma(w_2 z_2 + w_1 x_3)$

$E_1 = (y_1 - \hat{y}_1)^2$

$E = E_1 + E_2 + E_3$

$E_2 = (y_2 - \hat{y}_2)^2$

$E_3 = (y_3 - \hat{y}_3)^2$

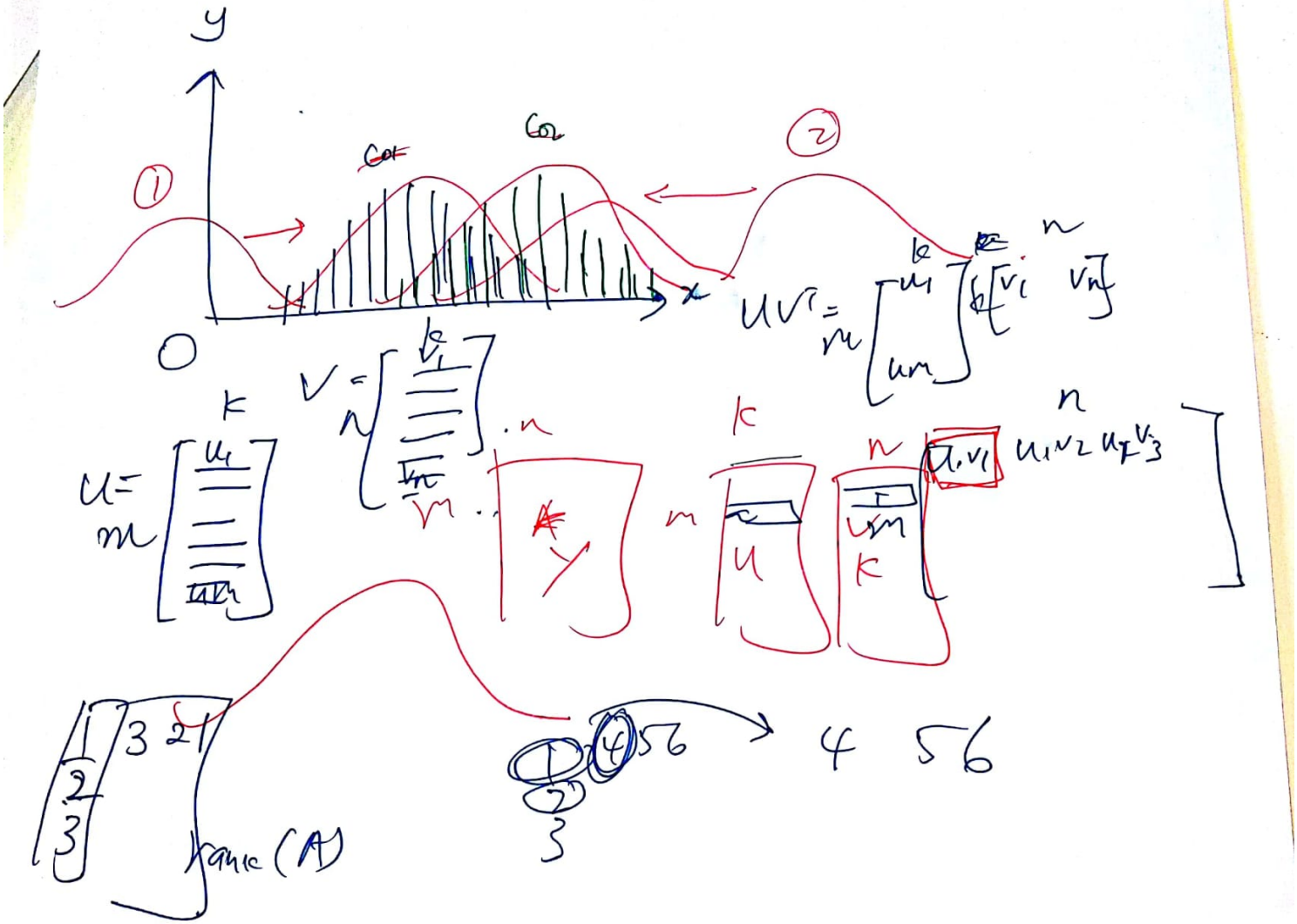
$\frac{dE}{dw_2}$

E_1 X

E_2: $\frac{dE_2}{dy_2} \times \frac{dy_2}{dz_2} \times \frac{dz_2}{dw_2}$

E_3: $\frac{dE_3}{dy_3} \times \frac{dy_3}{dz_3} \times \frac{dz_3}{dw_2}$

$+ \frac{dE_3}{dy_3} \times \frac{dy_3}{dz_3} \times \frac{dz_3}{dz_2} \times \frac{dz_2}{dw_2}$



$$\ell - \frac{k(d+2)}{2} + \log n$$