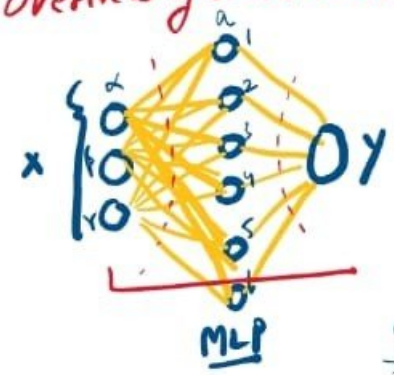
#CNNs y Project plan

10 December 2024 17:32

Overview of last lecture



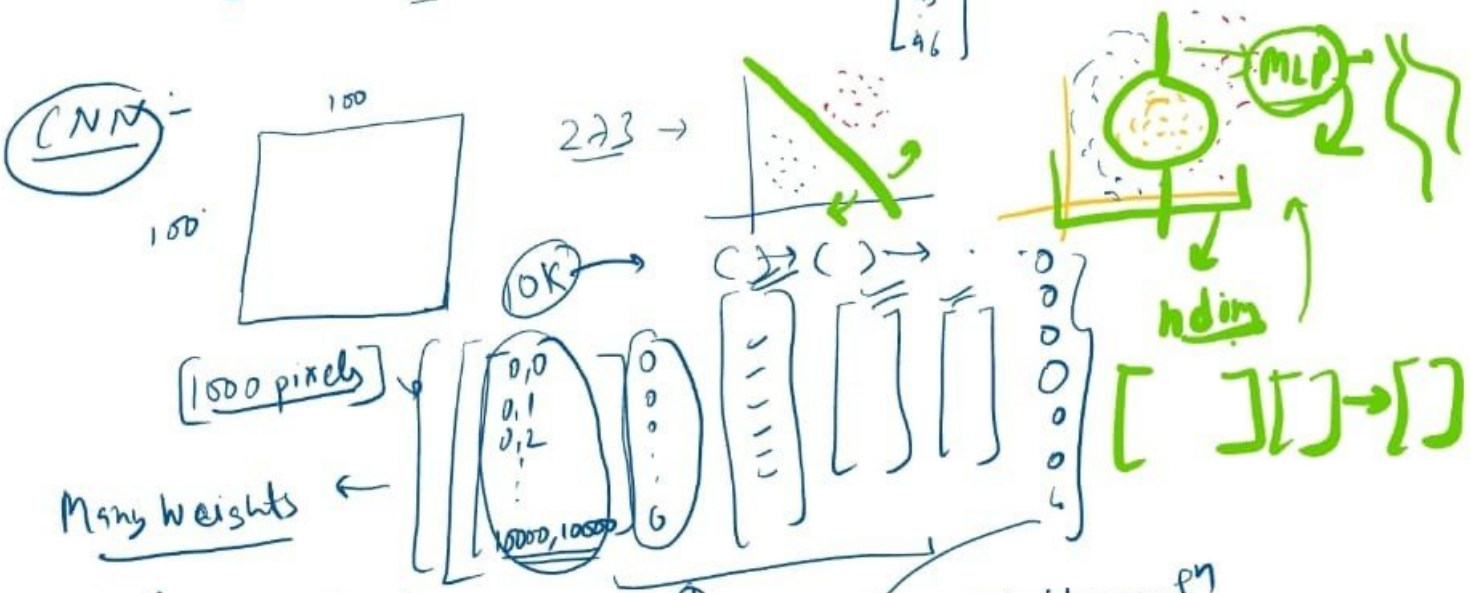
$a = ReLU[WX + b]$

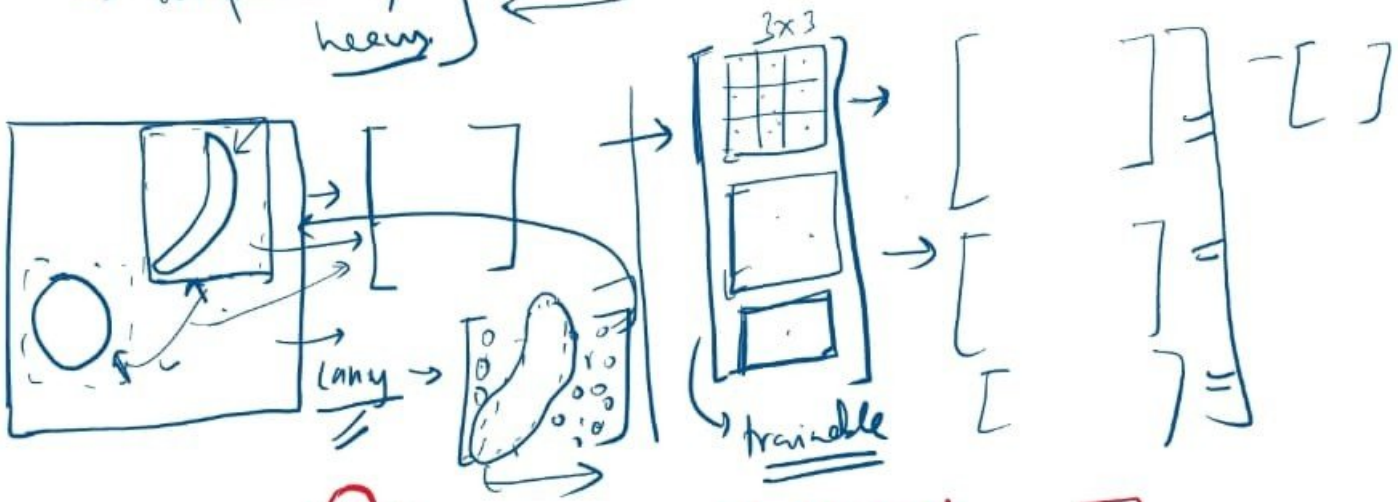
$= Relu\left[\begin{bmatrix} w_1^\alpha & w_1^\beta & w_1^\gamma \\ w_2^\alpha & w_2^\beta & w_2^\gamma \\ & \vdots & \\ w_6^\alpha & w_6^\beta & w_6^\gamma \end{bmatrix}\begin{bmatrix} x^\alpha \\ x^\beta \\ x^\gamma \end{bmatrix} + \begin{bmatrix} b_1 \\ b_2 \\ b_3 \\ \vdots \\ b_6 \end{bmatrix}\right] =$

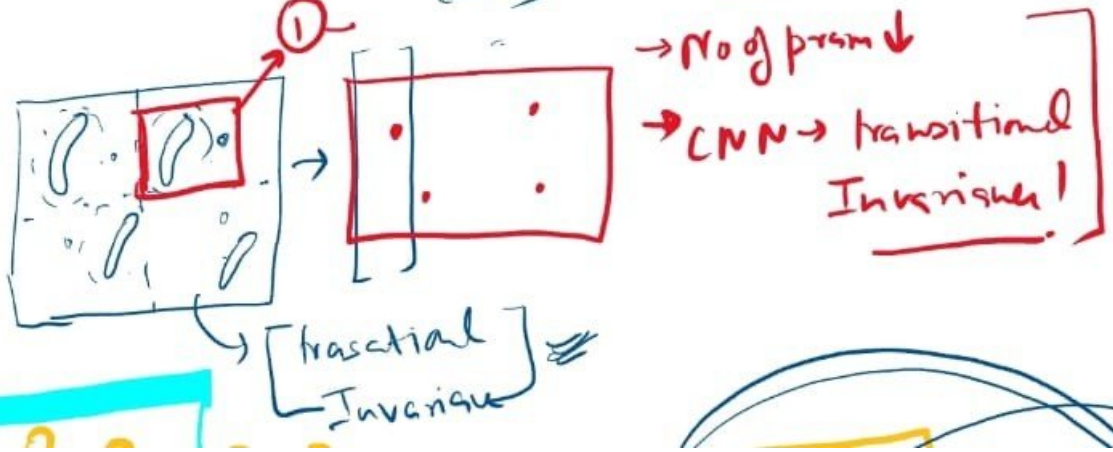
→ Approximate any f^n via "Piecewise Linear function"

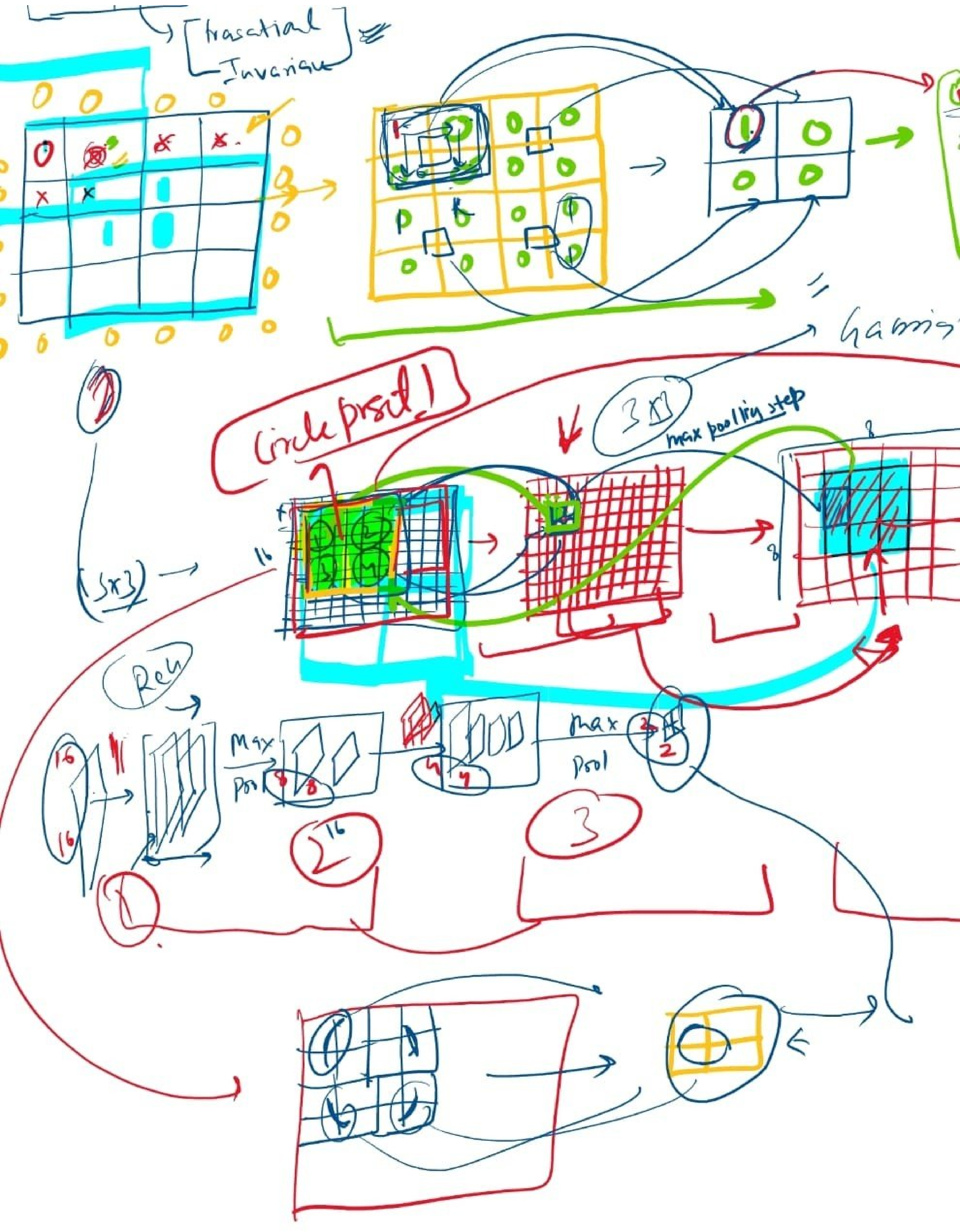
↳ Universal approx. theorem

y then $Y = [w^1\ w^2 \cdots w^6]\begin{bmatrix} a_1 \\ a_2 \\ a_3 \\ \vdots \\ a_6 \end{bmatrix}$

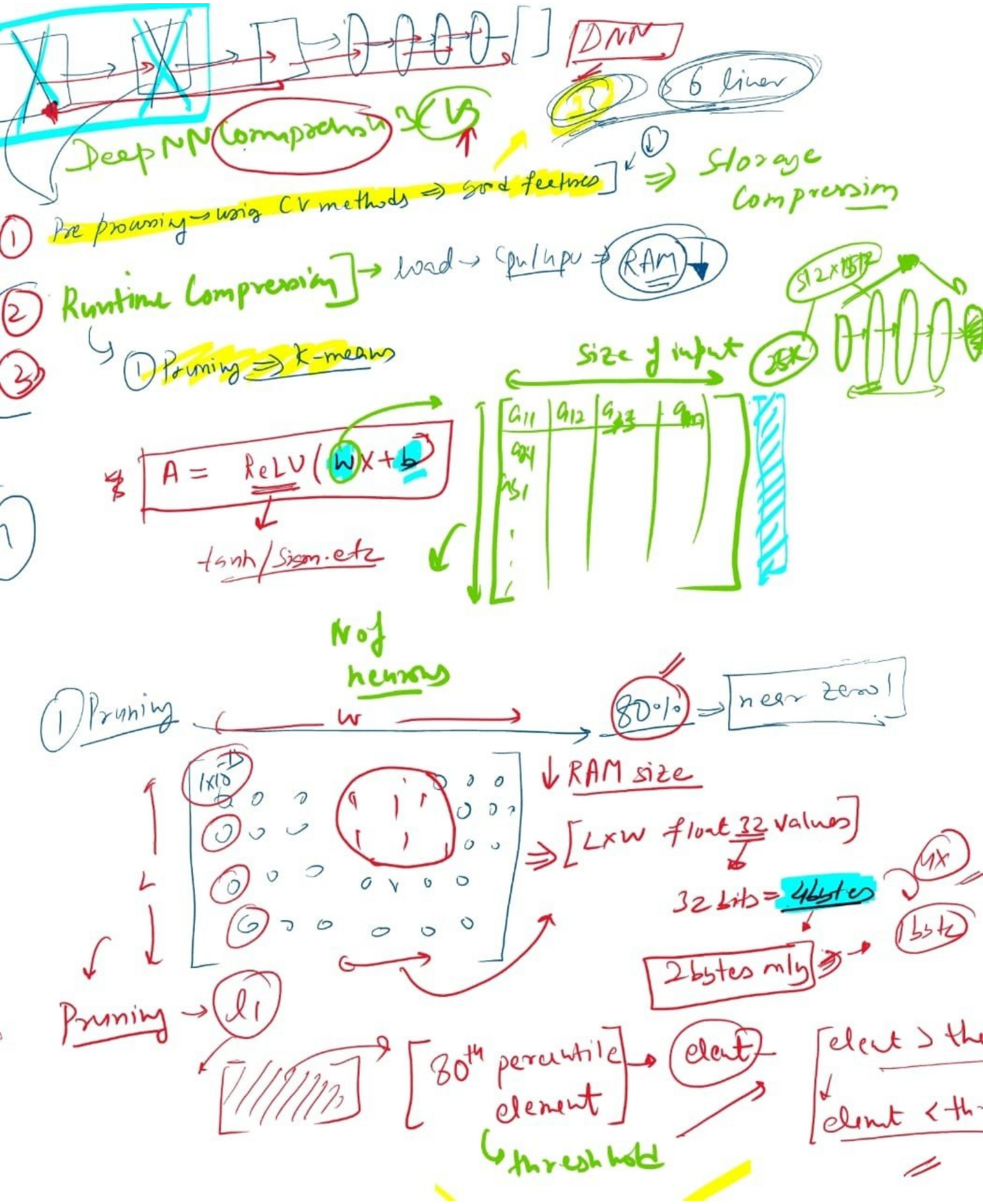


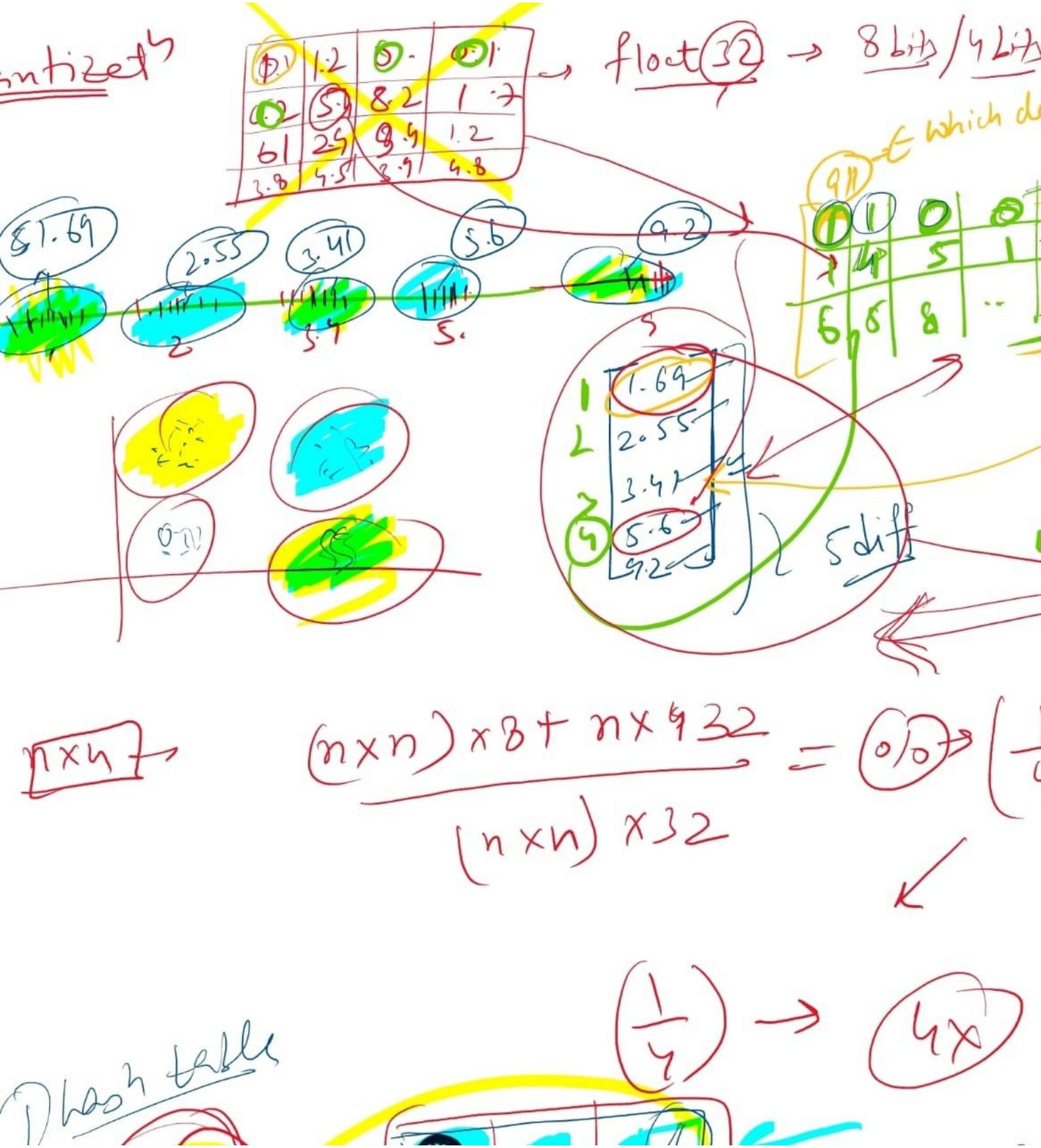






Trasatial Invarique
Circle posit 1
3x1
max pooling step
(3x3)
16
8
Relu
Max Pool
Max Pool
16
16
8
8
4
4
2
2
2[16]
3

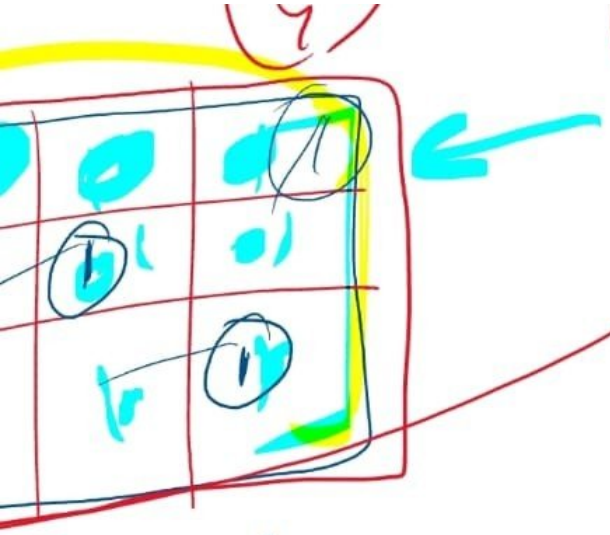

DNN
6 layer
Deep NN Compression
Storage Compression
1) Pre processing → using CV methods ⇒ good features
2) Runtime Compression → load → cpu/gpu ⇒ RAM
3)
1) Pruning ⇒ K-means
Size of input
A = ReLU(WX+b)
tanh/Sigm.etc
No of neurons
1) Pruning
W
80%
near zero!
1x10
RAM size
[LxW float 32 values
32 bits = 4bytes
4x
4bytes
2bytes only
Pruning → l1
80th percentile element
element
threshold
element > th
element < th



$n \times n \rightarrow \dfrac{(n \times n) \times 8 + n \times 4 \times 32}{(n \times n) \times 32} = \dfrac{0}{0} \rightarrow$

$\frac{1}{4} \rightarrow 4x$

Hash table



$$\frac{df}{dt} = \frac{\partial f}{\partial x} \times \frac{dx}{dt}$$

$$\frac{\partial f}{\partial y}\frac{dy}{dt} + \frac{\partial f}{\partial z}$$

assignment

① find values for the elent ~~is~~ ass
1st cluster

② Add their gradient] → 1

[new gradient for mem-1 ⇒ Σ( )

RAM SIZE

Guys small clarification, sorry I forgot why there is dx/dt = 1 is there in the chain rule because the mean stored is the average of all the values inside a cluster.....so

Mean = addition (value/N)

so

d(value)/d(mean) = 1/N which is a constant and will be incorporated in the learning rate

Sorry I said that it is intuition, it is logically sound now

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