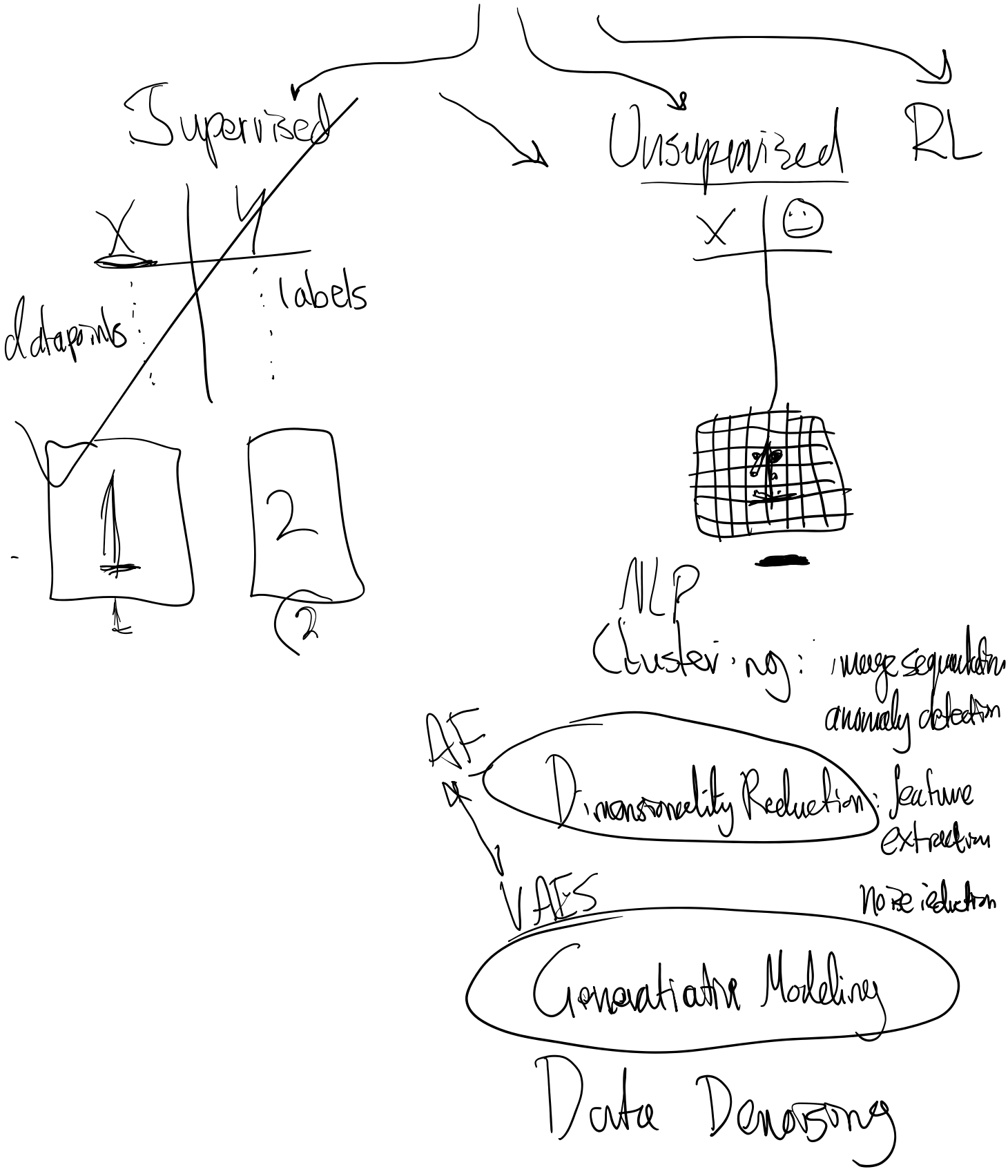
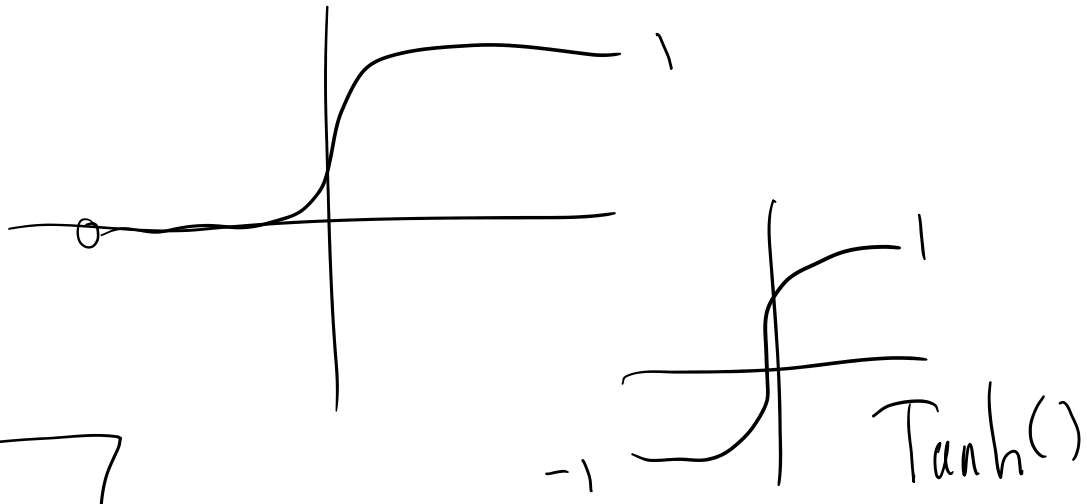
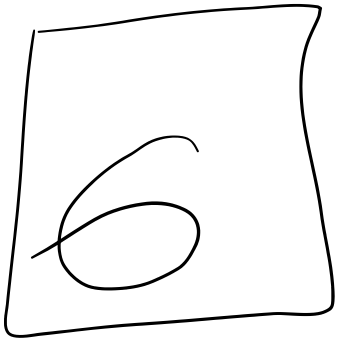
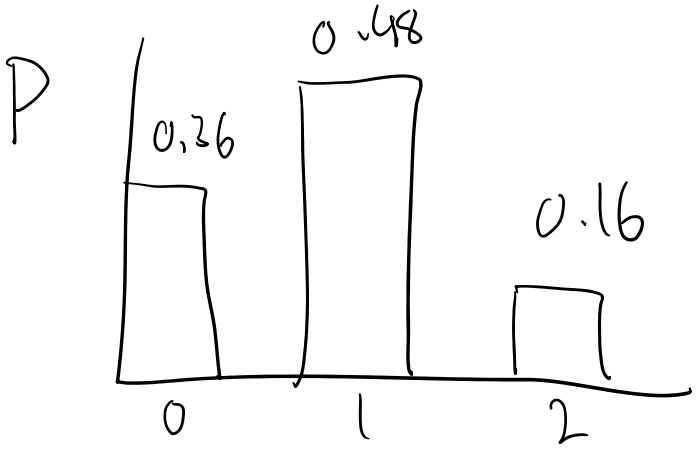
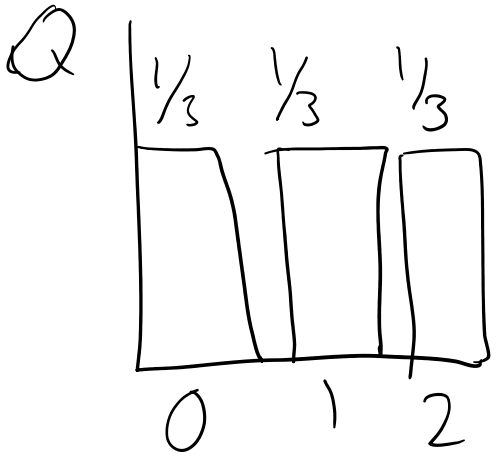

Supervised
Unsupervised
RL
X
y
X
datapoints
labels
1
2
(2)
NLP
Clustering: image segmentation
anomaly detection
AE
Dimensionality Reduction: feature extraction
VAEs
noise reduction
Generative Modeling
Data Denoising





$$D_{KL}(Q \| P) = \sum_x Q(x) \log\left(\frac{Q(x)}{P(x)}\right)$$





$$D_{KL}(Q \| P) = \frac{1}{3}\log\left(\frac{0.3}{0.36}\right) + \frac{1}{3}\log\left(\frac{0.23}{0.48}\right) + \frac{1}{3}\log\left(\frac{0.13}{0.16}\right)$$

$$= 0.09637 \text{ nats}$$

Convolution

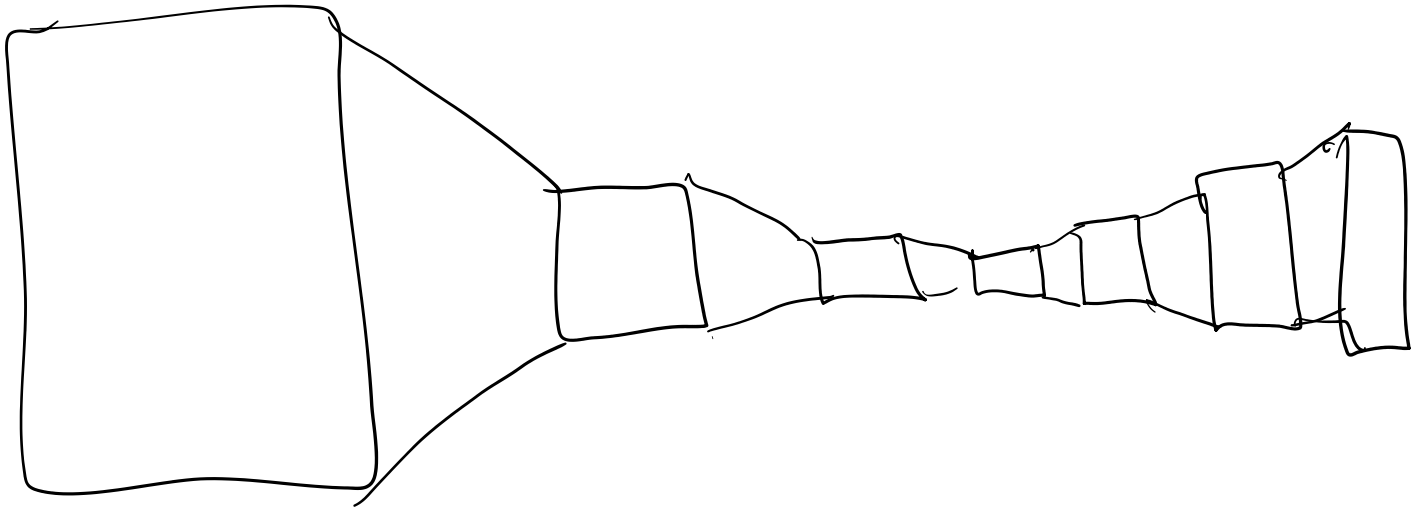
$$\text{Output} = \frac{\text{input} - \text{Kernel} + (2 \times \text{padding})}{\text{Stride}} + 1$$

$$= \frac{28 - 3 + (2 \times 1)}{2} + 1$$

$$= \lfloor 14.5 \rfloor = 14$$

16, 28, 28
32, 14, 14
64, 7, 7

$$\frac{14 - 3(2 \times 1)}{2} + 1 = 7$$



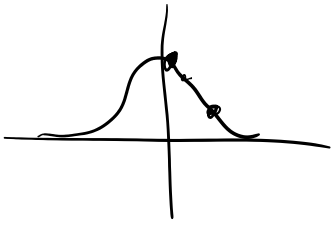
~~Out~~ ConvTranspose

$$Output = (input - 1) \times Stride - (2 \times padding) + Kernel + \underset{padding}{output}$$

$out = (7-1) \times 1 - (2 \times 1) + 3 + 0$

$= 7$

32, 7, 7



$$Out = (7-1) \times 2 - (2 \times 1) + 3 + 1$$

$$= 14$$

$$out = (14-1) \times 2 - (2 \times 1) + 3 + 1$$

$$= 28$$