

(H) (How) are you.
H
How
are
you

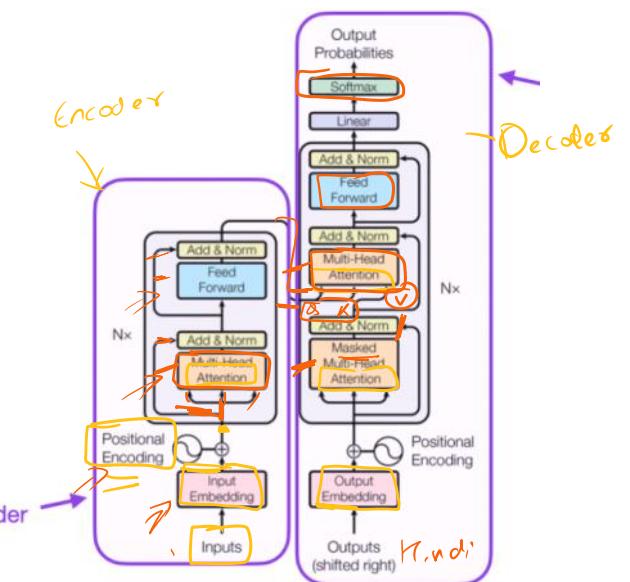
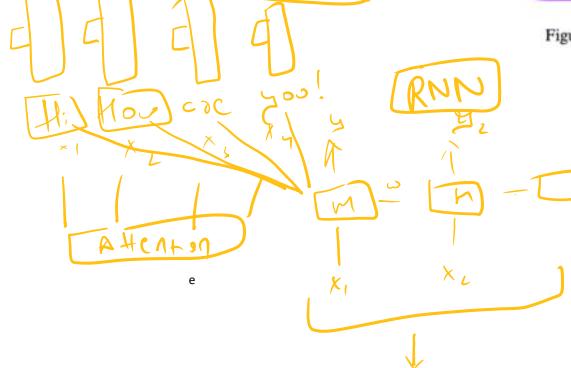
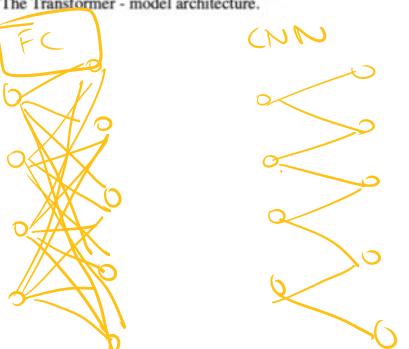


Figure 1: The Transformer - model architecture.



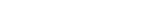


• Self Attention Model

Hi	—	E
How	—	M
Are	—	B
You	—	f
		d.
		J
		n
		o

$$x_1 = \boxed{-21.712100}, \quad x_2 = \boxed{1}$$

$$\begin{array}{r} \times 2 \\ \hline \end{array}$$

x_1 

x_2

A hand-drawn diagram illustrating a softmax function. It shows a vector $x = [x_1, x_2, x_3, x_4]$ being processed by a softmax layer. The softmax layer has four neurons, each with a sigmoid-like activation function. The outputs are labeled as probabilities: $p_1 = 0.15$, $p_2 = 0.25$, $p_3 = 0.28$, and $p_4 = 0.32$.

A hand-drawn diagram consisting of five vertical rectangles arranged horizontally. Each rectangle contains two horizontal lines. Above the first four rectangles are labels X₁, X₂, X₃, and X₄. Above the fifth rectangle is a label E.

Over Key Value

Scale Dot product Attention:

A hand-drawn diagram in orange ink. It features two main rectangular shapes, each with a single circular eye. The top shape has the letters 'K' and 'I' written on its right side. The bottom shape has the letters 'I' and 'I' written on its right side. There are several lines connecting the two shapes, suggesting they are interacting or communicating.

The diagram illustrates the relationship between the singular noun 'sojourn' and the plural noun 'sojourns'. On the left, a single orange-outlined box contains the word 'sojourn'. An arrow points from this box to the right, where three identical boxes are arranged horizontally. Each of these three boxes contains the word 'sojourn' followed by a red 'x' symbol, indicating that each box represents a single instance of the noun.

$$\phi = \omega_q x$$

$$k = w_k x$$

$$V = \omega_x$$

Scale of Attention

Local

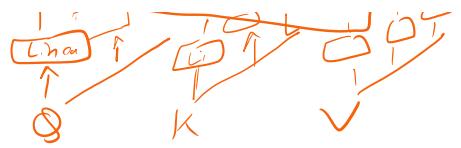
Lid

Global

Single head Attention mode

```

graph LR
    Input(( )) --> Mask[Mask]
    Mask --> Scale[Scale]
    Scale --> MetMul[Met Mul]
    MetMul --> Motor[Motor]
    Motor --> Servo(( ))
  
```



↗ ↗ ↗ ↗

PCA - Principle Component Analysis

nof \geq PC's

(carbohydrates, fats)
Energy

- covariance matrix
- Eigen vectors

Protein Amino Acid
body building

Vitamin Mineral
explain PC2

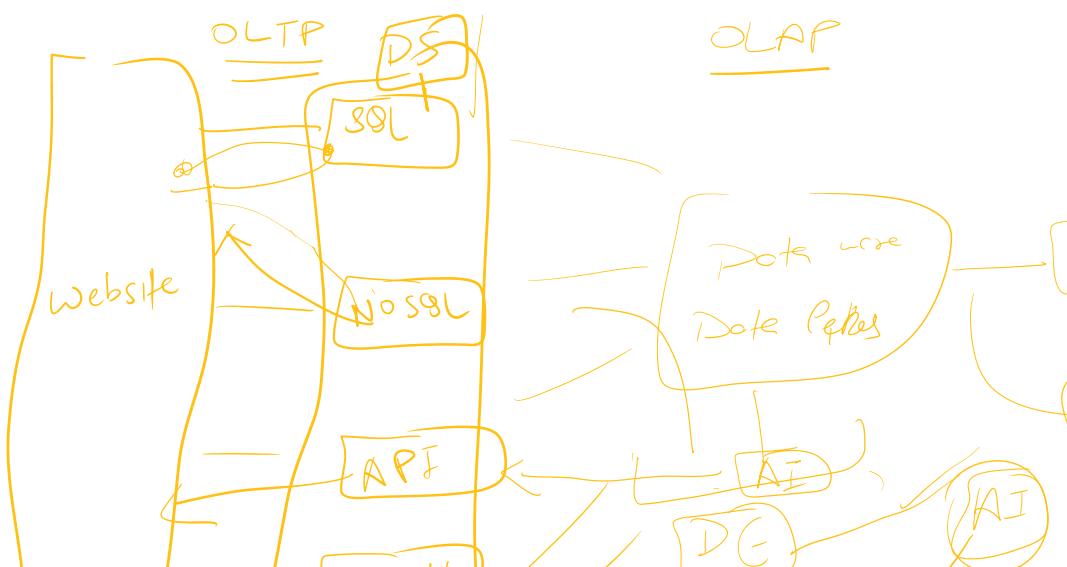
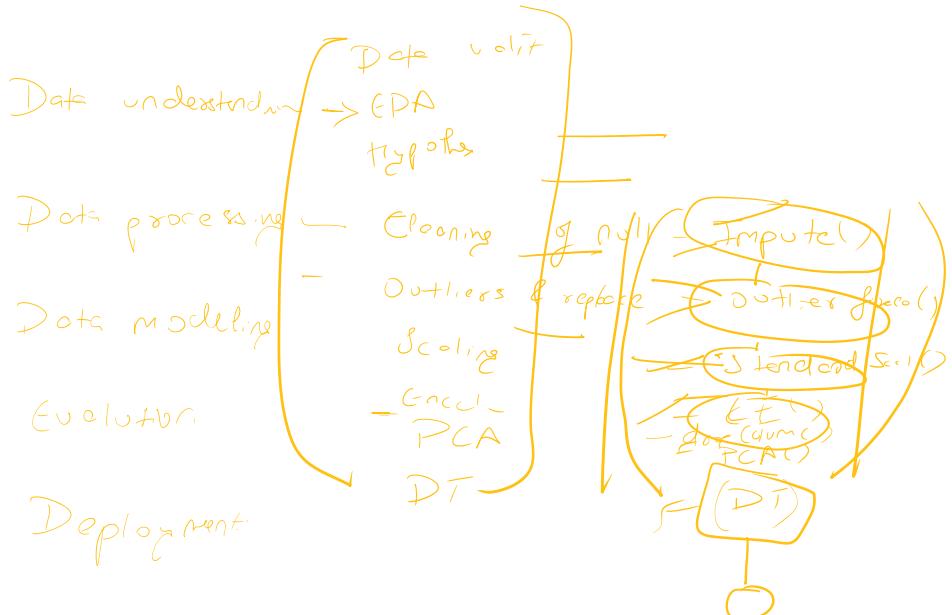
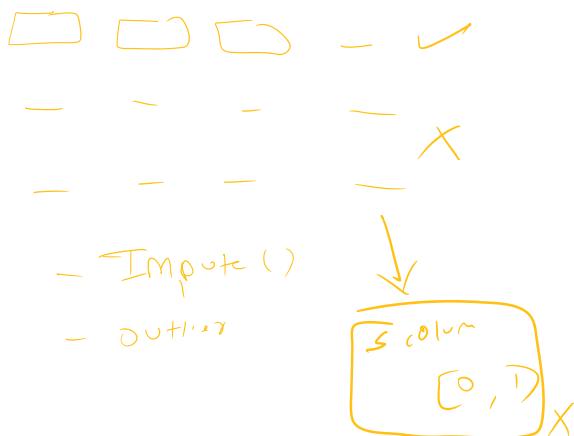
PC2

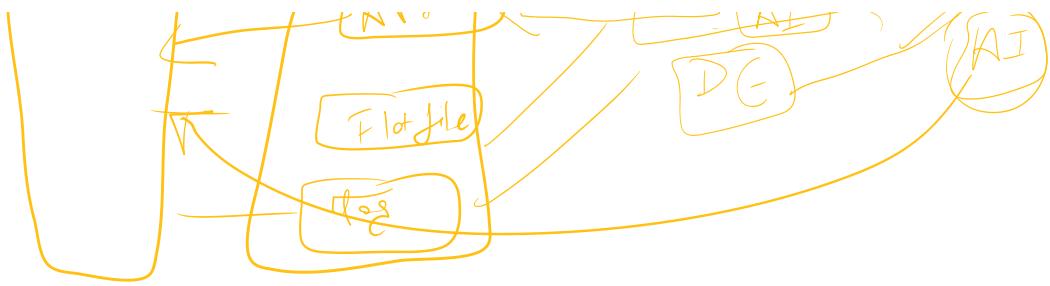
PC3

PC1

PC1

Business Unit \Rightarrow





$\text{Coef} = \frac{\partial L(x,y)}{\partial w}$

$$L(x,y) = \sum_{i=1}^n \frac{(x_i - \bar{x})(y_i - \bar{y}) + (x_i - \bar{x})(y_i - \bar{y})}{n-1}$$

$$\bar{x} = \frac{x_1 + x_2 + \dots + x_n}{n}$$

$$L(\bar{x}, \bar{y}) = 0$$

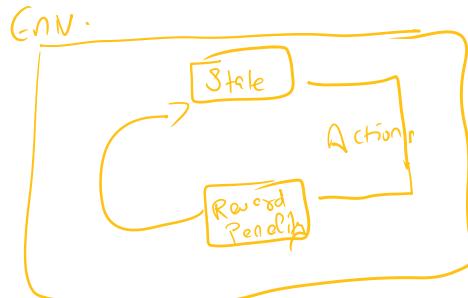
$$[] \rightarrow [0] = 0$$

$$\bar{D} = \bar{D}$$

Reinforcement Learning

- Environment
- State
- Action
- Reward/Penalty

◦ Policy



◦ Goal based learning

Interaction based learning

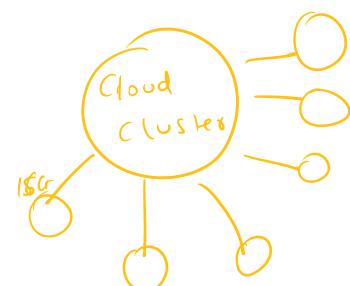
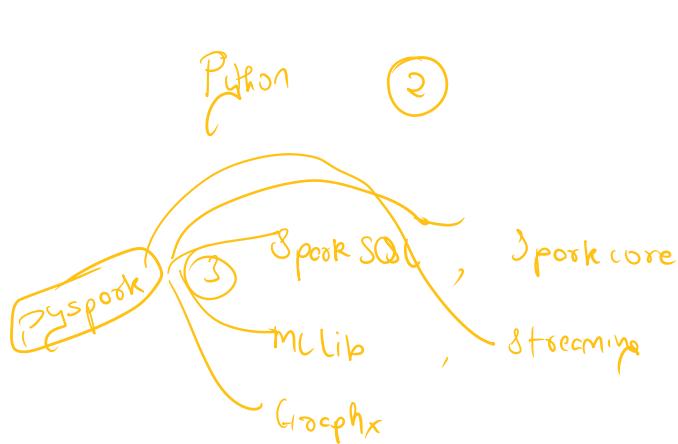
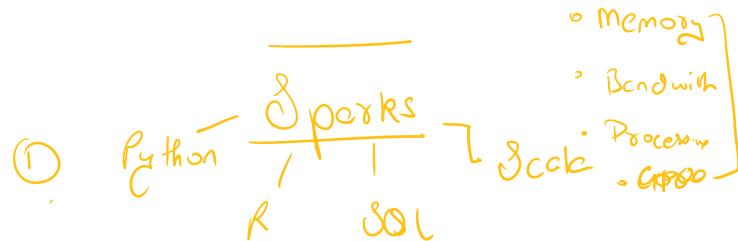
◦ Model based

Model free
Q-learning

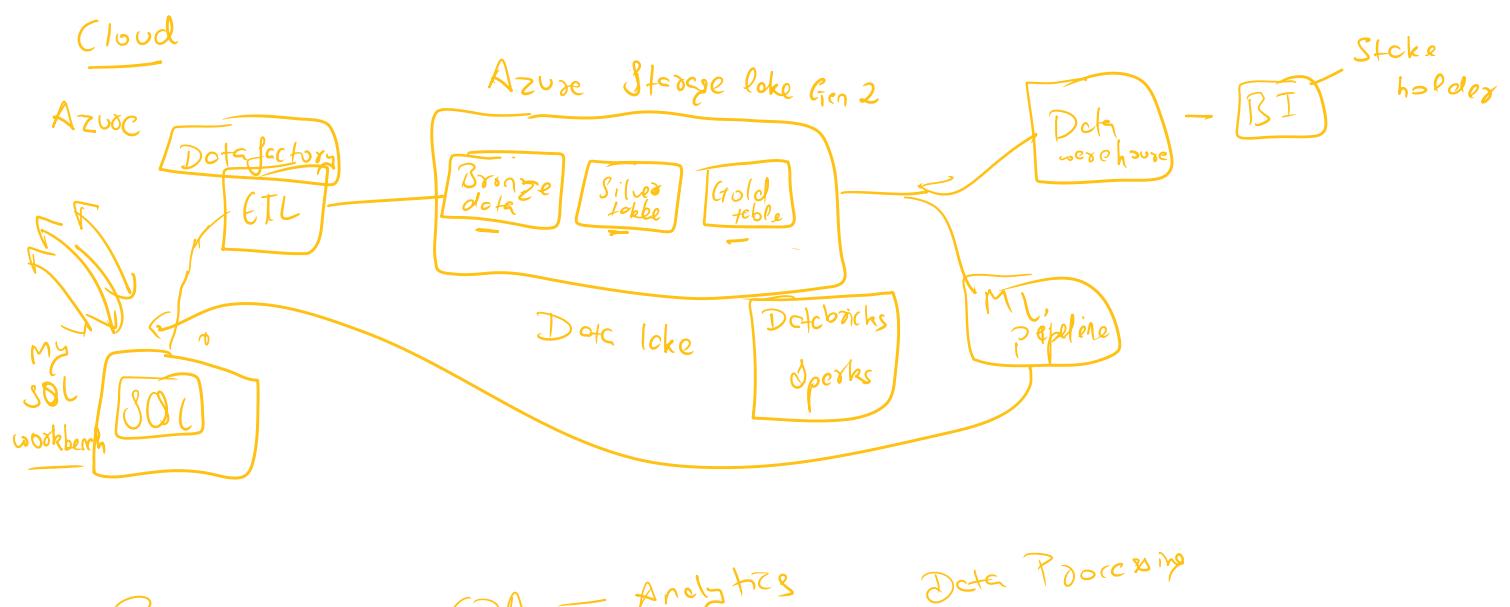
DQN

Big Data - 5 Vs

- Volume
- Velocity
- Value
- Variety
- Veracity



Data Architecture



$$MP = 3$$

