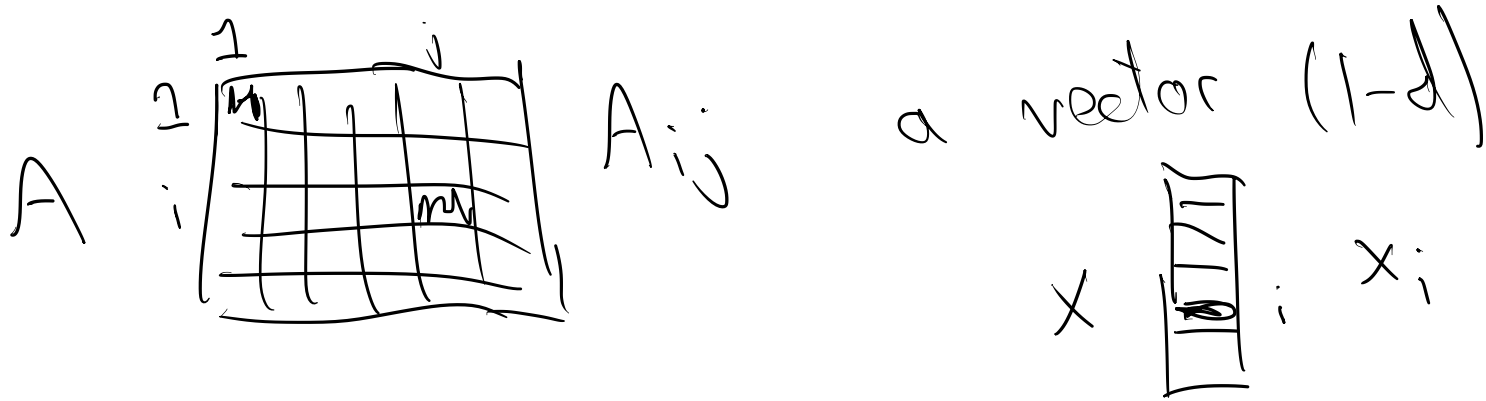


Sep 2, 2020

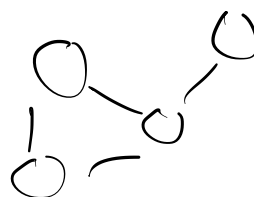
What is a matrix? 2-d array of numbers



Linear algebra:  $T: V \rightarrow W$

A matrix represent linear map, w/lt choice of basis

Matrix from data:  $A_{ij} = \#$  times that words  $i$  and  $j$  appear in some sentence

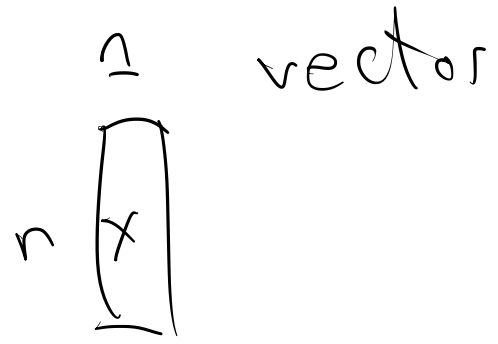
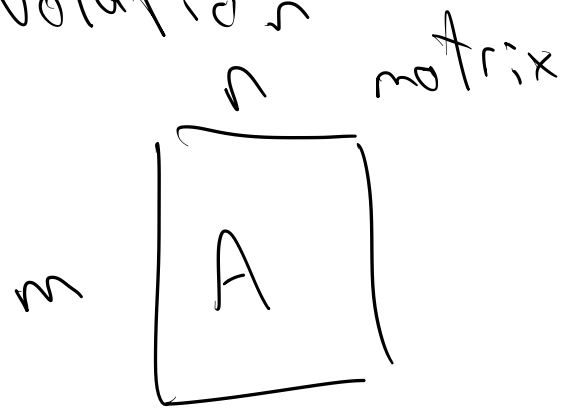
Matrix from graph:   $A_{ij} = \begin{cases} 1 & (i,j) \text{ exists} \\ 0 & \text{else} \end{cases}$

Matrix transformation in NN:  $y_i \approx c^T \sigma(W_2 \sigma(W_1 x_i + b_1) + b_2)$   
 PDE discretized

We'll start from matrices and some LA knowledge

$$A(x+y) = Ax + Ay$$

Notation



entry  $A_{ij}$

$$A \in \mathbb{R}^{m \times n}$$

$x_i$

$$x \in \mathbb{R}^n$$

$$A \in \mathbb{C}^{m \times n}, x \in \mathbb{C}^n$$

finite-dim

