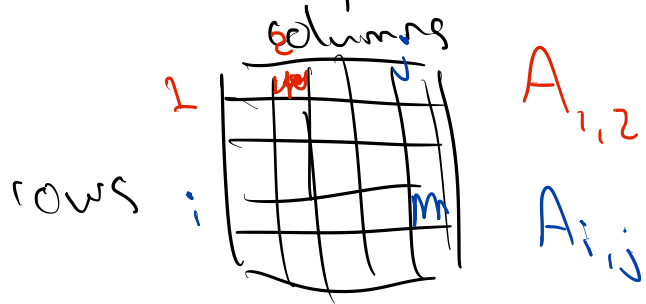


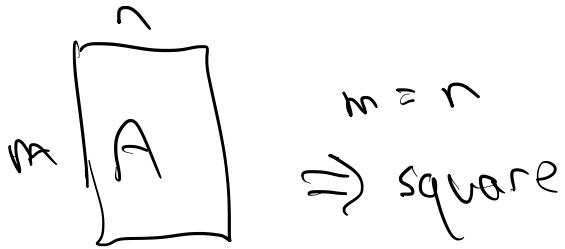
Feb 8, 2021 (CS 4220)

What is a matrix?

2-d array of numbers



A is $m \times n \Rightarrow m$ rows, n cols



All math on computers is dealing with matrices

data users



physics

$A_{ij} =$ force of particle
on particle j

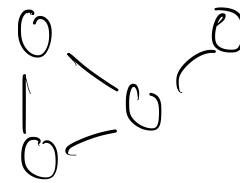
linear algebra

$$L: \underline{V} \rightarrow \underline{W}$$

bases V, W

$$L(v_j) = \sum c_i w_i \quad A_{ij} = c_i$$

other math/CS



$$A_{ij} = \begin{cases} 1 & (i,j) \text{ exists} \\ 0 & \text{otherwise} \end{cases}$$

algorithms

NN:

$$y_i \approx c^T \sigma \left(\underset{\uparrow \text{optimize}}{W_2} \sigma \left(\underset{\uparrow \text{optimize}}{W_1 x_i + b_1} + b_2 \right) \right)$$

Goals

- literate + comfortable with matrix comps + basic opt
- know general building blocks and ideas
- confidence to find a good solution for your problem

Admin

- 6 HWs (6 x 8%)
 - take-home midterm (16%)
 - " " final (32%)
 - participation (4%)
- } see web site

material 4x: readings, lecture, HWs, exam