Simple Youtube Recommendation engine using basic Math

6th oct 2019

AppliedAICourse.com

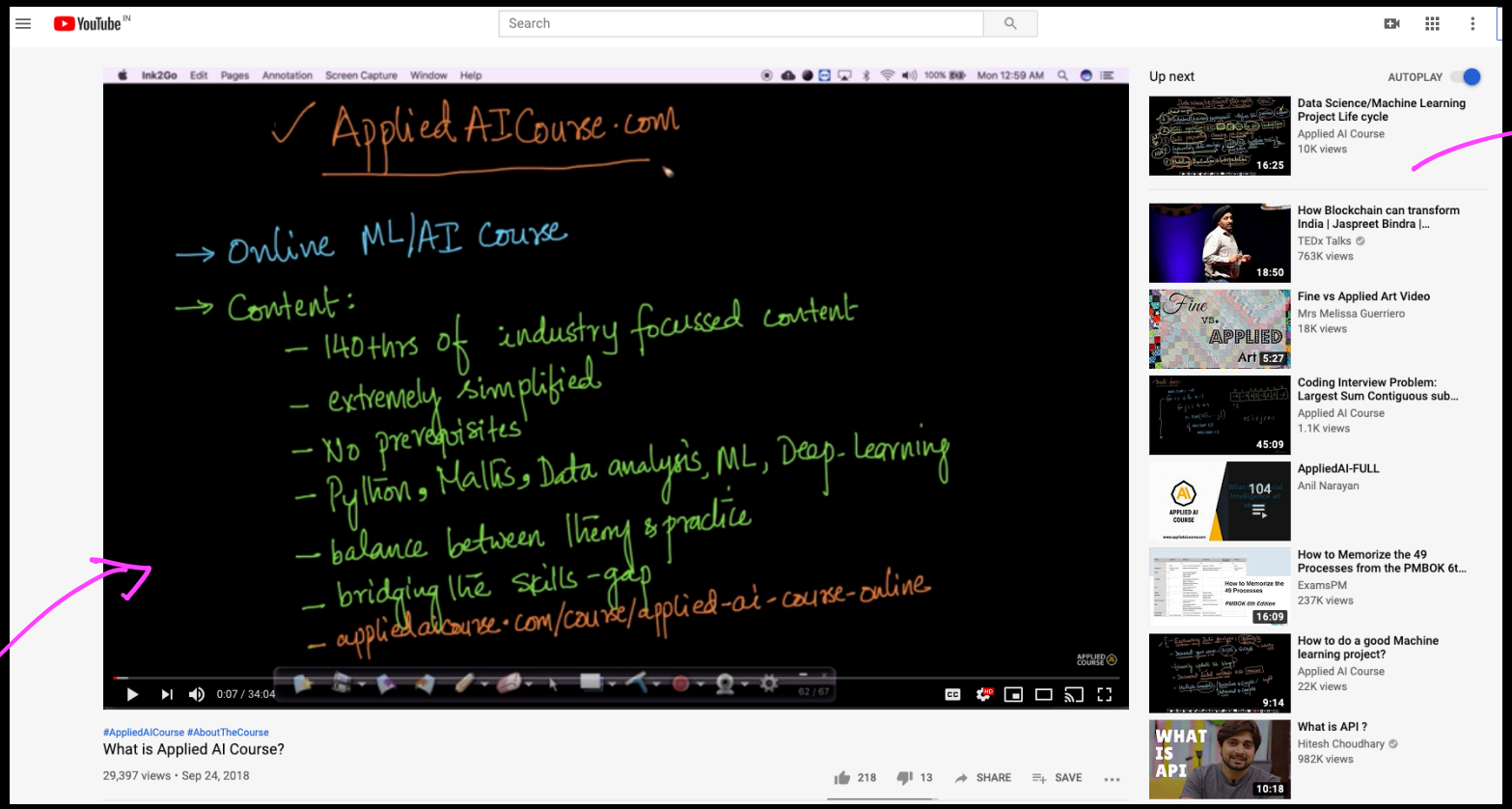
Agenda / Plan :

→ Understand the problem

→ use simple 9th / 10th math to build a first-cut-solution

→ Slightly advanced - math (11th & 12th)

Problem - definition.



→ Video-recommendations

Current video.

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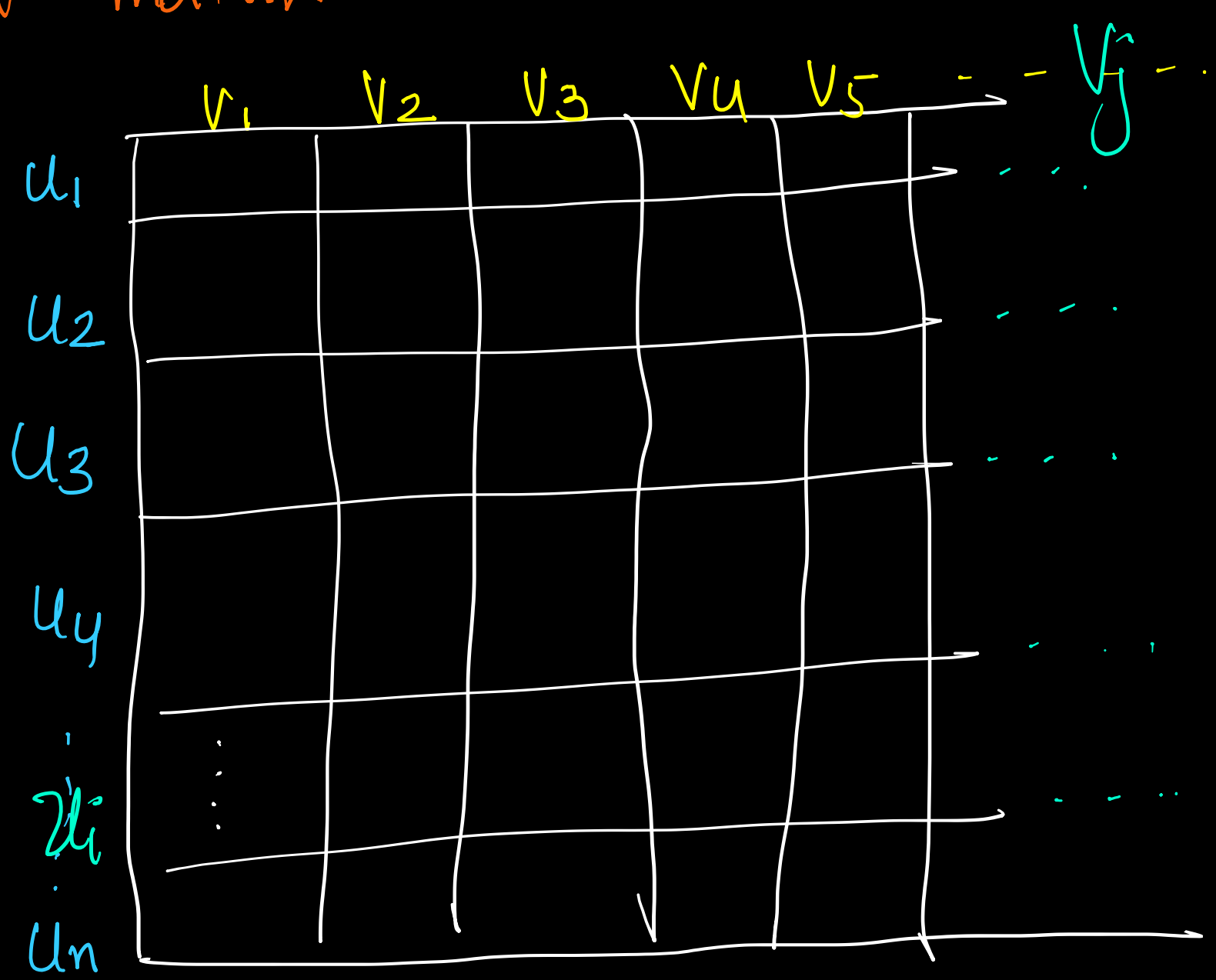
What dalā does youtube have?

Data - matrix



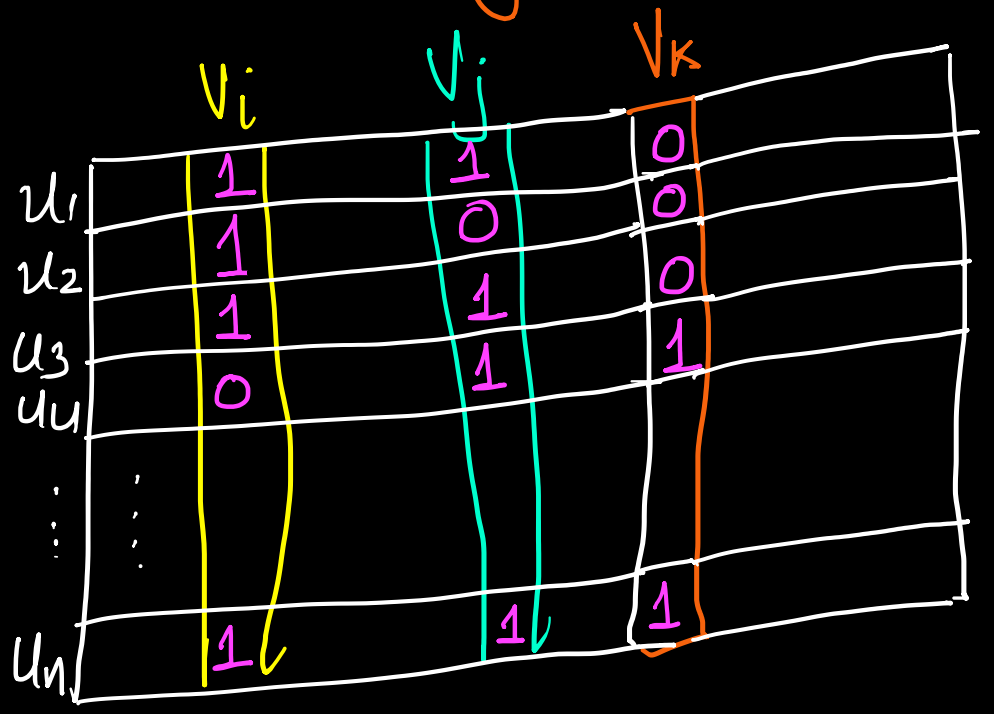
m = # videos

n = # users.

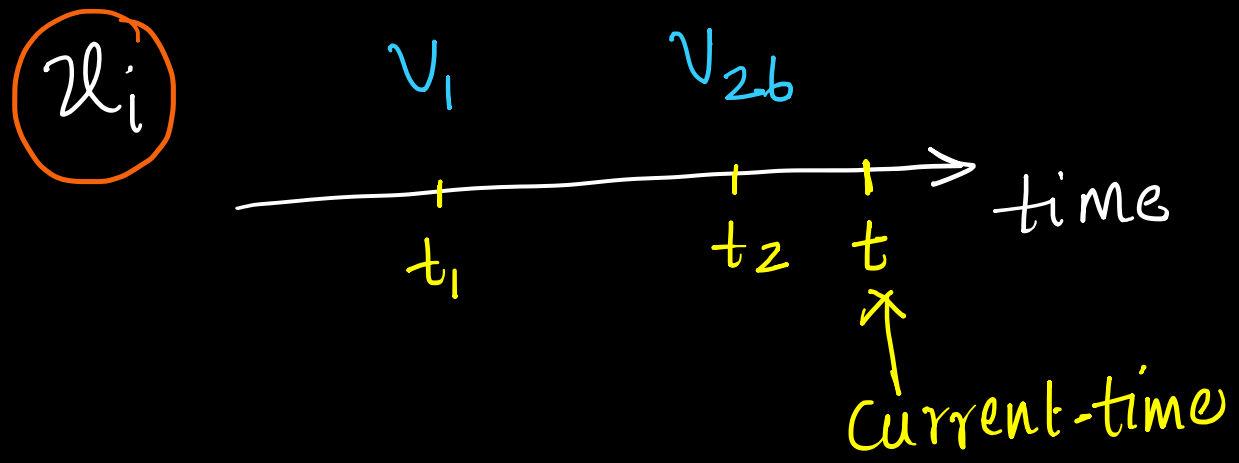
Simplest - idea: Similarity

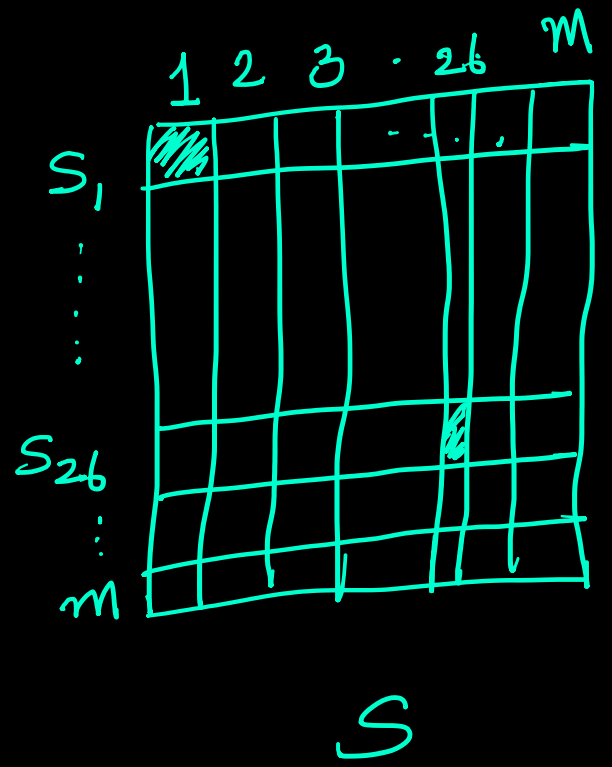
Finding similar-videos using Data-matrix

$$Sim(V_i, V_j) = |V_i \cap V_j|$$



Recommend based on Similarity-scores.

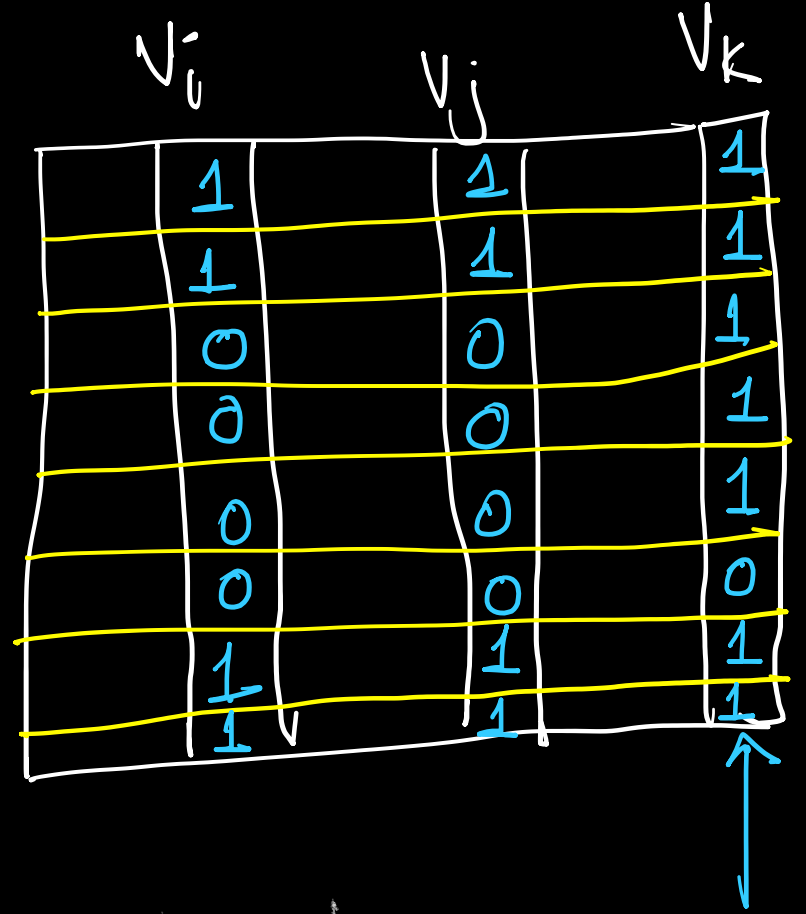




Problem/Issue: Popular-videos

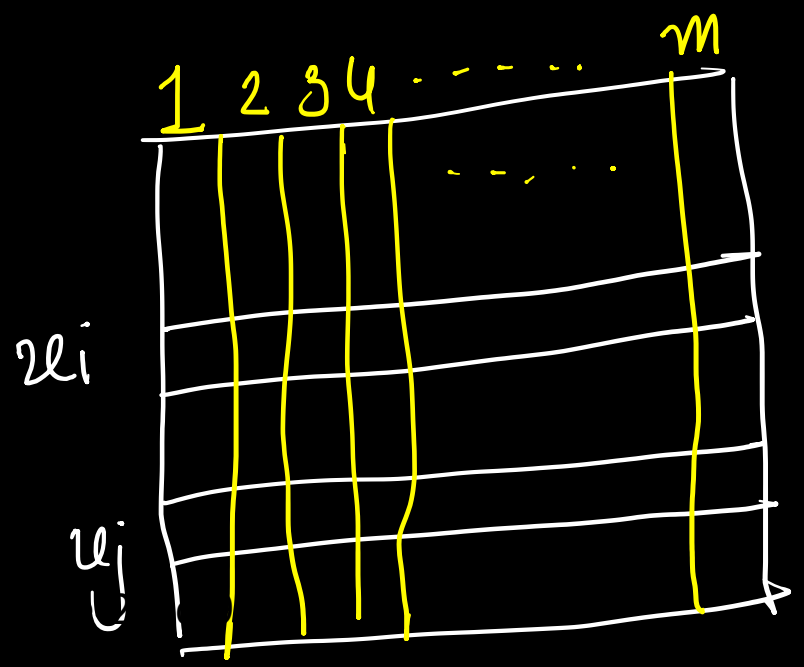
$$Sim(V_i, V_j) = Sim(V_i, V_k)$$

$$JS(V_i, V_k) = \frac{|V_i \cap V_k|}{|V_i \cup V_k|}$$



$$JS(V_i, V_j) = \frac{4}{4} \quad \text{vs} \quad JS(V_i, V_k) = \frac{4}{7}$$

Similarity between users:



Deployment & Productionization

1B users

100 MM videos

New-videos-watched

Eigen-values & Eigen-vector based Approach

SVD & MF

$A_{n \times m}$

$A^T_{m \times n} \; A_{n \times m} = S_{m \times m}$