To do : SVD Visualization   [Really short discussion]

① Review SVD forms

② SVD Juypter Notebook

Review : ① Full form : $A = U \Sigma V^T$ ← $m \times n$

$\quad\quad m \times n \quad m \times m \quad n \times n$

② Compact Form : $A = U_r \Sigma_r V_r^T$, $r = \text{rank}(A)$

only take non-zero σ_i's

$\quad\quad m \times n \quad\quad m \times r \quad r \times r \quad r \times n$

③ Outer Product Form : $A = \sum_{i=1}^{r} \sigma_i \vec{u}_i \vec{v}_i^T$

$$\begin{bmatrix} \vec{u}_1 \; \ldots \; \vec{u}_r \end{bmatrix} \begin{bmatrix} \sigma_1 & & 0 \\ & \ddots & \\ 0 & & \sigma_r \end{bmatrix} \left(\vec{v}_1 \; \ldots \; \vec{v}_r \right)^T$$

Watch recording for rest of discussion!