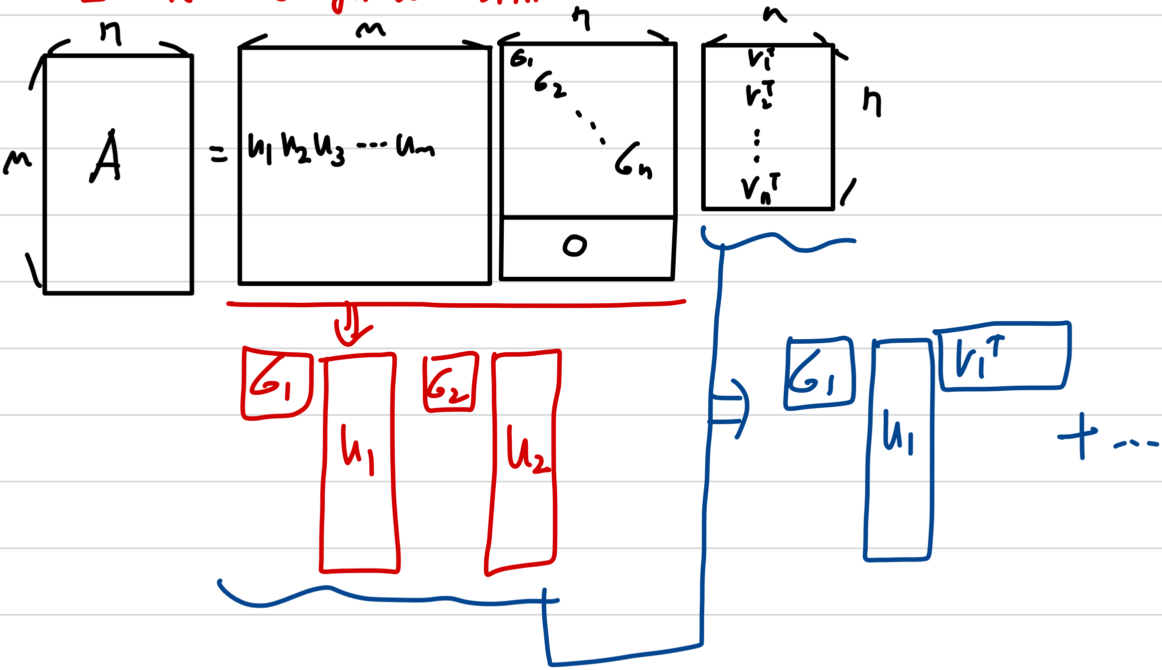
* SVD

rectangular matrix $A \in R^{m \times n}$

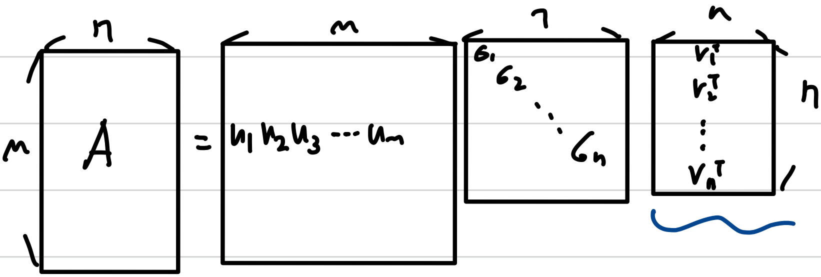
$A = V \Sigma V^T$ eigen decomposition $\Rightarrow VDV^{-1}$

↳ $V \in R^{m \times m}$, $V \in R^{n \times n}$ orthonormal columns

$\Sigma \in R^{m \times n}$ diagonal matrix

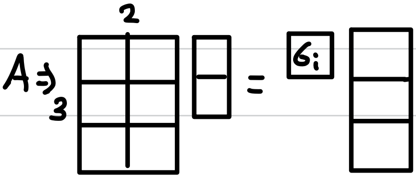


• Reduced form of SVD



• $Av_i = \sigma_i u_i$

ex)



• $AV = U\Sigma \iff [Av_1, Av_2, \cdots Av_n] = [\sigma_1 u_1, \sigma_2 u_2 \cdots \sigma_n u_n]$

$V^{-1} = V^T$ ($V \in R^{n \times n}$ orthonormal columns)

$\therefore AV = U\Sigma \iff A = U\Sigma V^T$