



# The Initial Data Set

---

- Matrix  $M_t$  contains  $c$  column vectors,  $m_1$  through  $m_c$ .

$$M_t = [ m_1 \ m_2 \ \dots \ m_c ]$$

- Taking the SVD of  $M_t$  gives us

$$M_t = [\hat{U}_t \ \tilde{U}_t] \begin{bmatrix} \hat{\Sigma}_t & 0 \\ 0 & \tilde{\Sigma}_t \end{bmatrix} [\hat{V}_t \ \tilde{V}_t]^H$$

where  $\hat{U}_t$  contains the  $k$  left singular vectors of  $M_t$  corresponding to its largest singular values, which are the orthonormal basis vectors of the desired subspace.