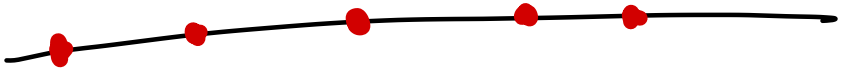
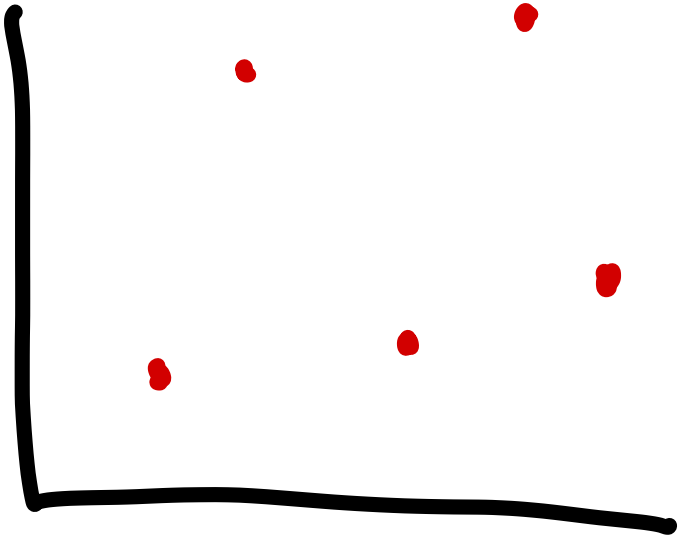
features

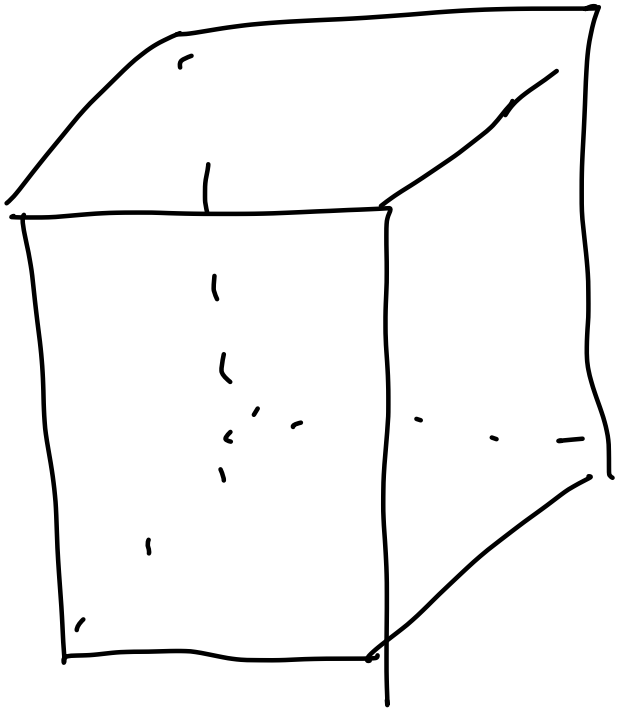
d

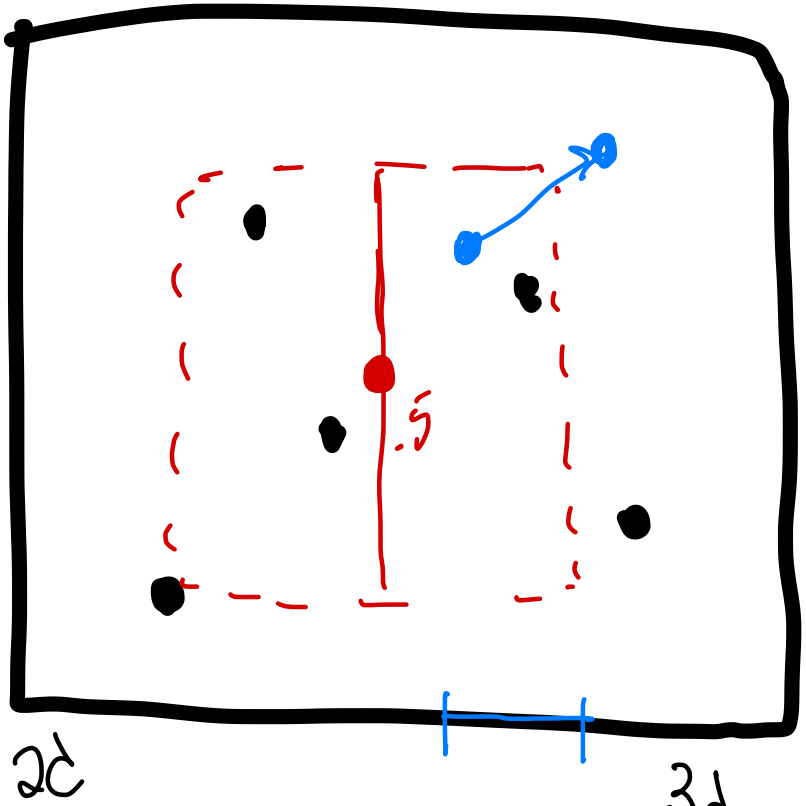
samples

02/28/2023







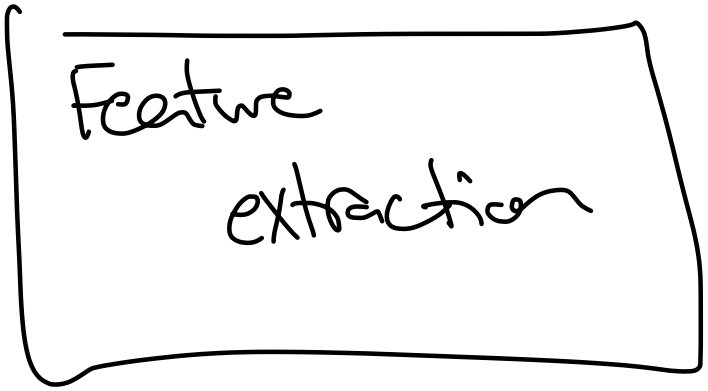


b: 1 1

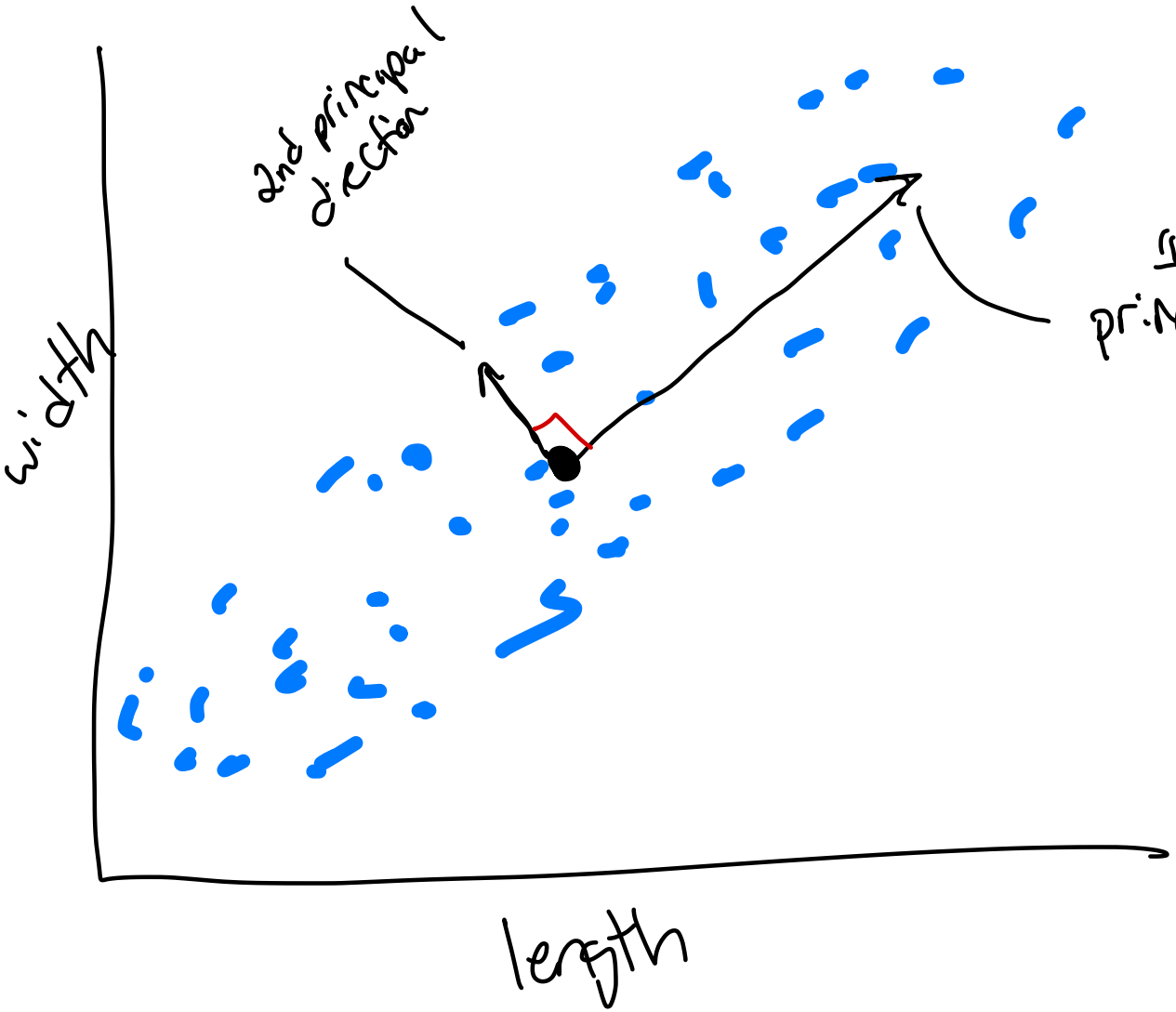
b: $\frac{1}{4}$ $\frac{1}{8}$ $\left(\frac{1}{2}\right)^d$

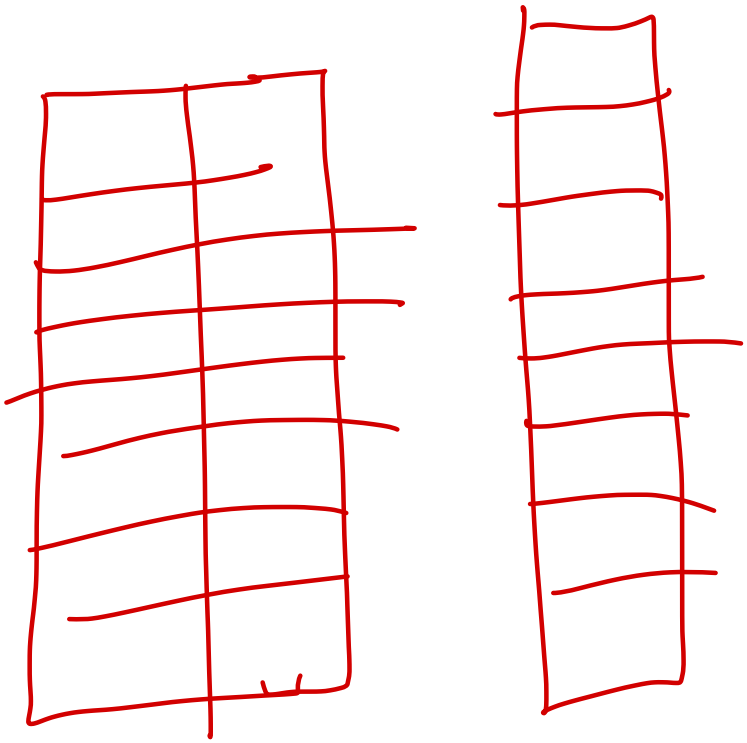
$\left(\frac{1}{2}\right)^2$ $\left(\frac{1}{2}\right)^3$

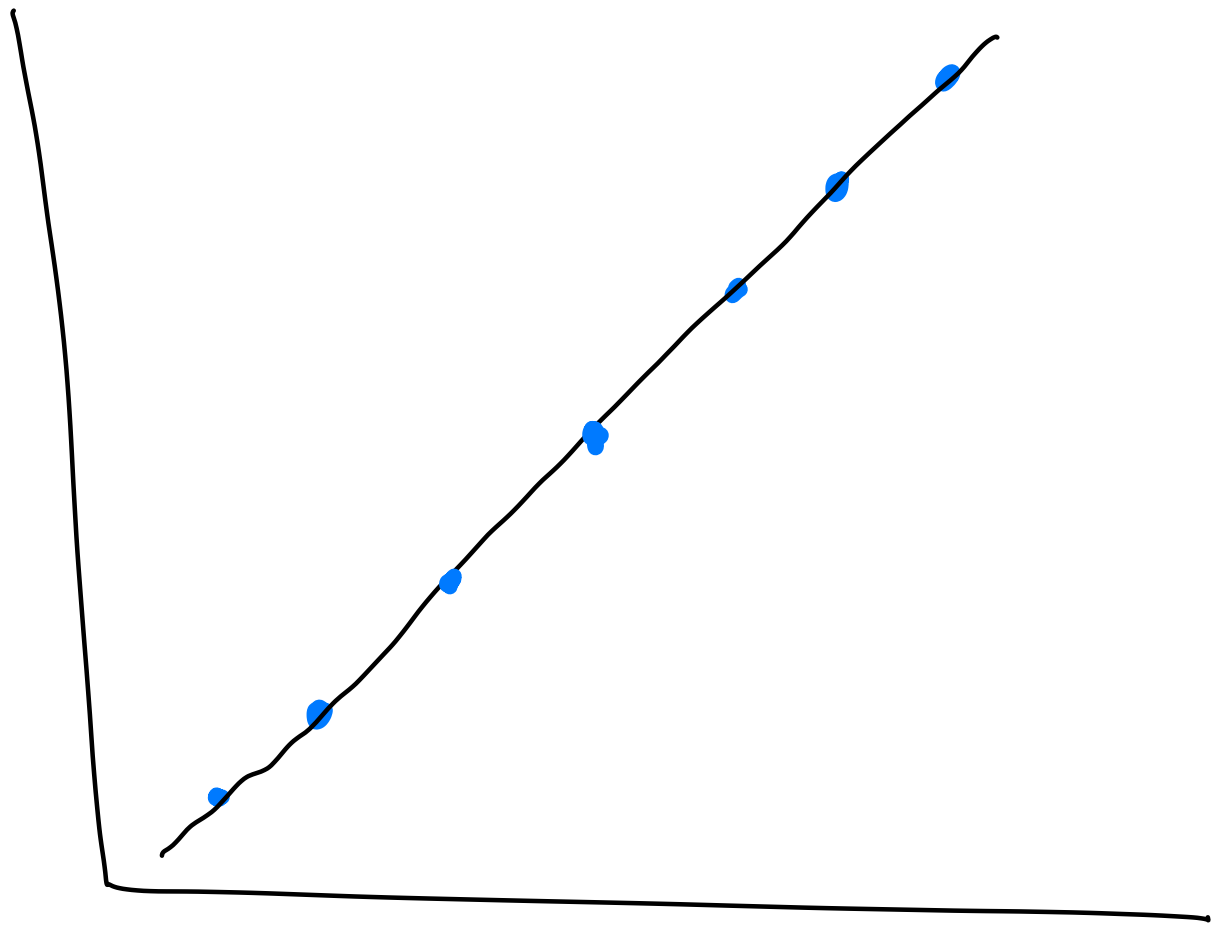
Feature
selection


Feature
extraction

Feature Extraction



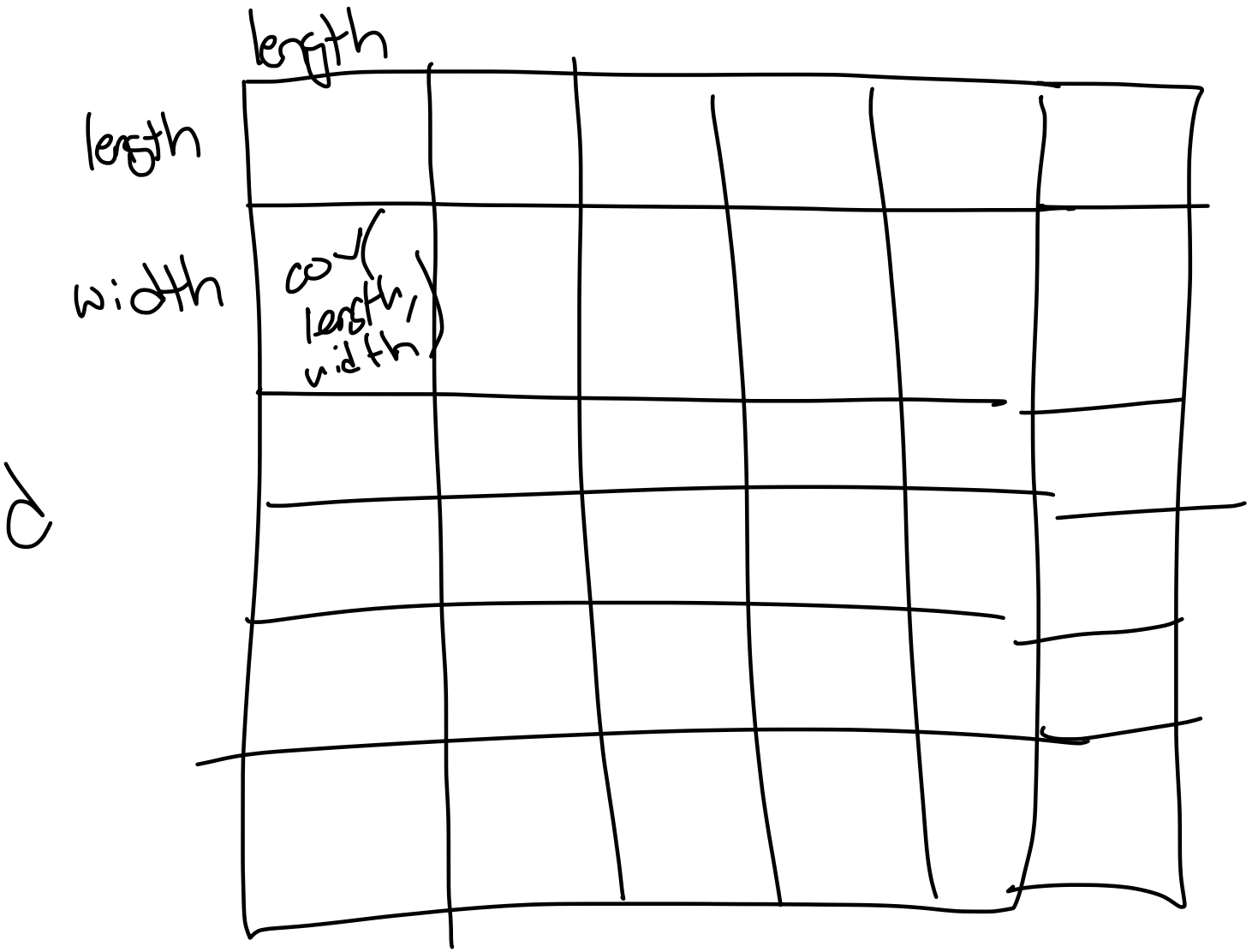




Covariance

N: data points
d: features

↳ measures how much 2 variable vary together



covariance matrix $X^T X \left(\frac{1}{N-1}\right)$

X: data matrix with 0 mean

$XV = U\Sigma$

V only use some of columns

$X = U\Sigma V^T$

$X^T X = (U\Sigma V^T)^T (U\Sigma V^T)$

$= V\Sigma U^T U\Sigma V^T$

$= V\Sigma^2 V^T$

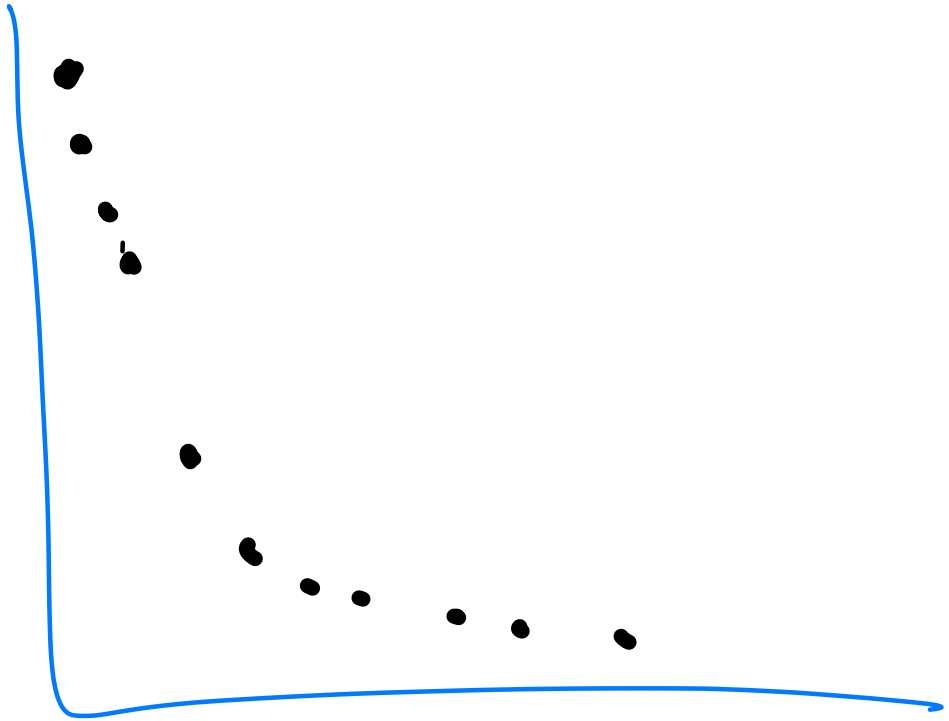
$(X^T X)V = V\Sigma^2$

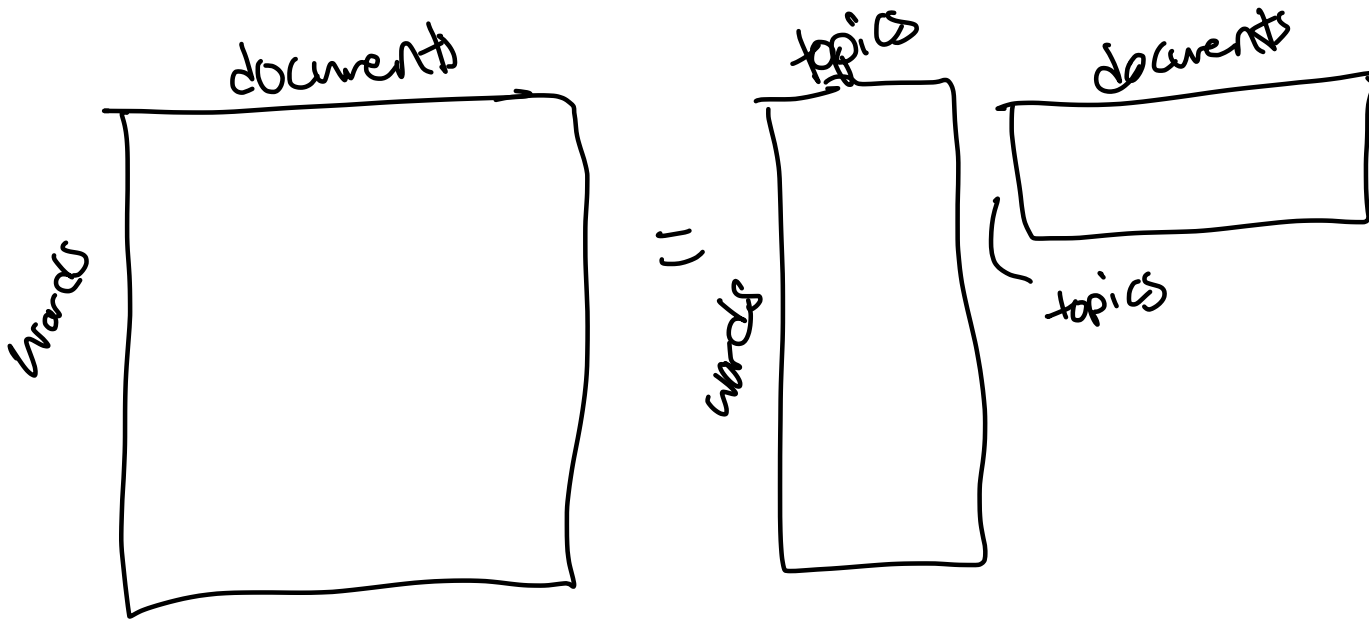
$Az = \lambda z$

$A = U\Sigma V^T$

Σ: diagonal matrix

U: orthogonal matrix



NMF

$A \approx WH$