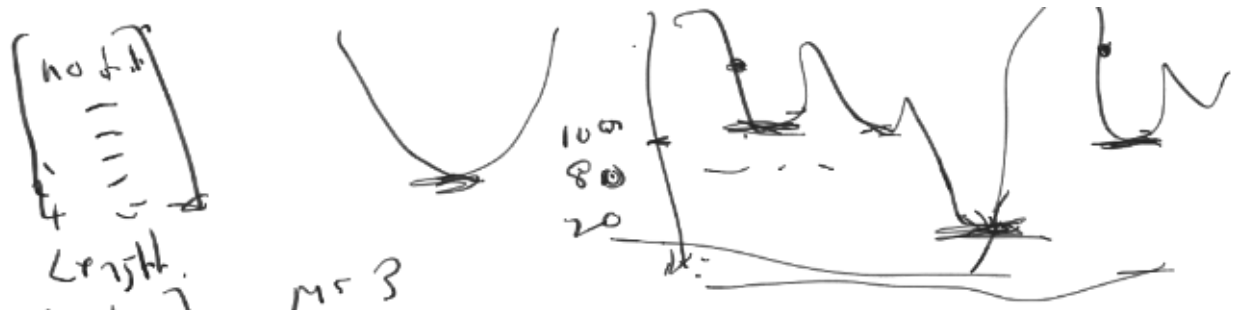
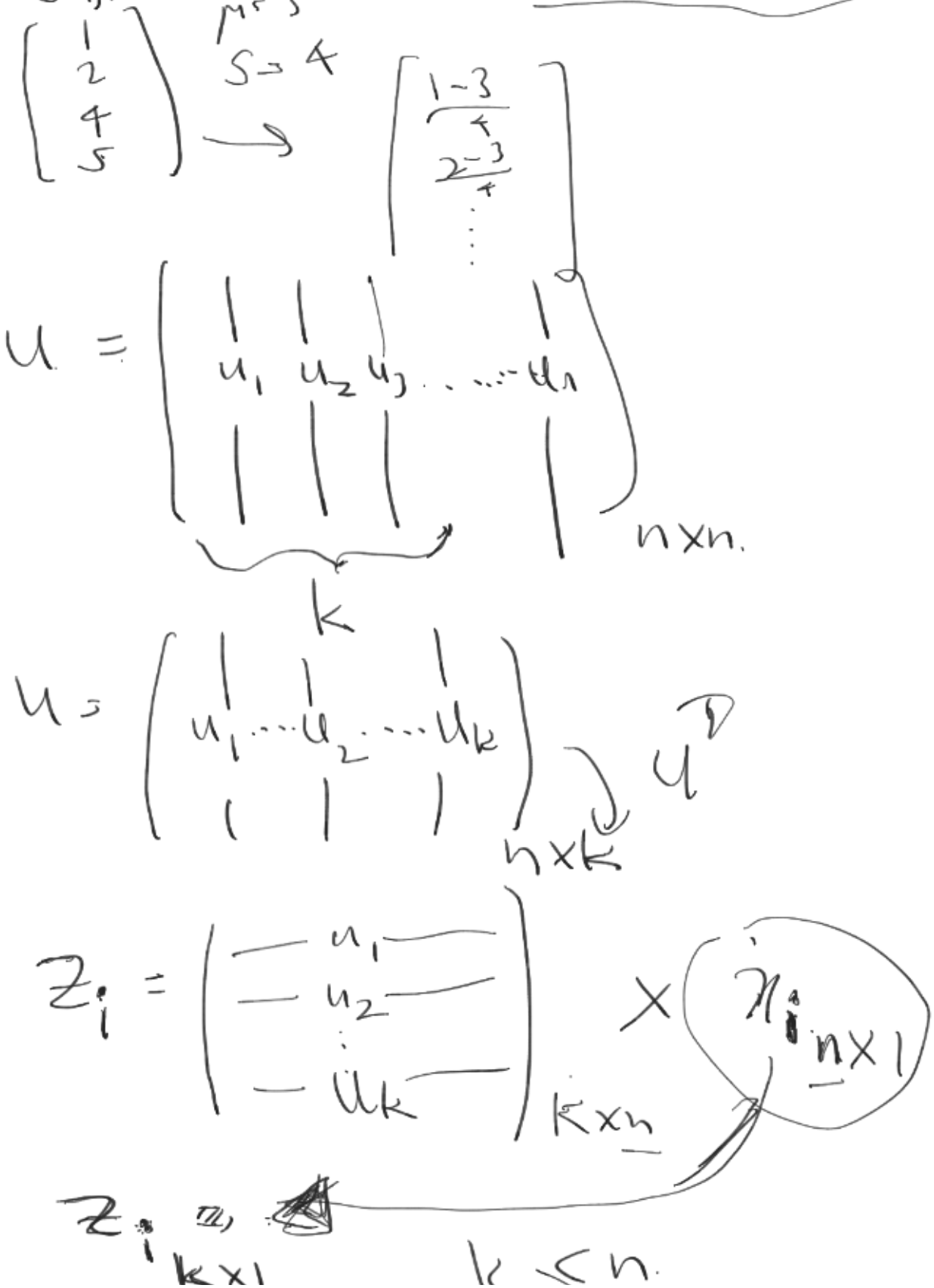
Unsupervised





$$X_{approx} = U_{reduce} \cdot Z$$
$$n \times 1 \quad n \times k \quad k \times 1$$

$k \leftarrow$ $n = 100$ $k = 80 \rightarrow 0.005$
$k = 70 \rightarrow 0.008$
$k = 60 \rightarrow 0.12$
0.01

$$S = \begin{bmatrix} S_{11} & 0 & 0 & \cdots & 0 \\ 0 & S_{22} & 0 & \cdots & 0 \\ 0 & 0 & S_{33} & \cdots & 0 \\ \vdots & \vdots & \vdots & \ddots & \vdots \\ 0 & 0 & 0 & \cdots & S_{nn} \end{bmatrix}_{n \times n}$$

$$1 - \frac{\sum_{i=1}^{k} S_{ii}}{\sum_{i=1}^{n} S_{ii}} \leq 0.01$$

$$\frac{\sum_{i=1}^{k} S_{ii}}{\sum_{i=1}^{n} S_{ii}} \geq 0.99$$

$n = 100$
$k = 80 \rightarrow 0.999$
$k = 70 \rightarrow 0.992$
$k = 60 \rightarrow 0.982$

$k = 70$

$k = 70$