PCA decomposition

	x_1	x_2	x_3	x_4
d_0	9	-7	6	9
d_1	10	0	0	1
d_2	0	-3	1	5
d_3	-7	0	4	9
d_4	-4	5	-7	2
d_5	5	8	-5	-8

$$Mean = [2.1666, 0.5, -0.1666, 3]$$

$$\Phi = \frac{1}{6} \sum_{0}^{6} (d_i - d_{mean})(d_i - d_{mean})^T$$

$$\Phi = \begin{bmatrix} 242.833 & -49.5 & 31.1667 & -59 \\ -49.5 & 145.5 & -113.5 & -141 \\ 31.1667 & -113.5 & 126.833 & 124 \\ -59 & -141 & 124 & 202 \end{bmatrix}$$

$$\text{eigen values} = |\Phi - \lambda I|$$

$$\text{eigen values} = [418.834 \quad 272.084 \quad 5.642 \quad 20.605]$$

$$\text{Sorted eigen values} = \begin{bmatrix} 418 \\ 272 \\ 20 \\ 5 \end{bmatrix} \} \text{ select max 2}$$

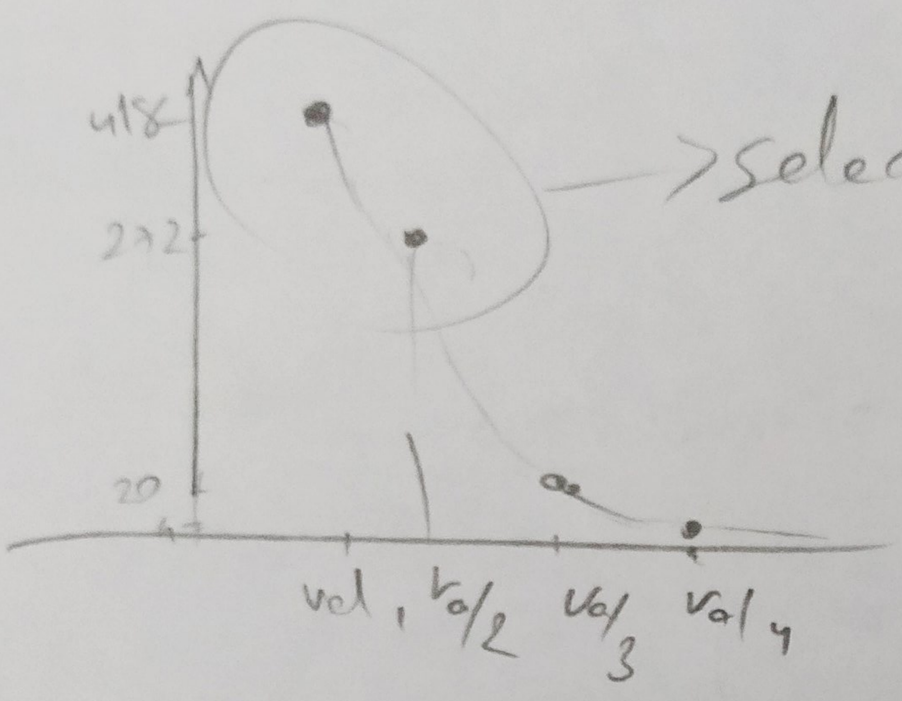
1954'den bu güne

eig-vector 1 → [0.031 -0.56 0.50 0.64]

eig-vector 2 → [-0.34 0,165 -0.106 0.271]

eig-vector 3 → [0.29 0.75 0.068 0.58]

eig-vector 4 → [0.157 -0.302 -0.851 0.388]



→ select 2 eig values

Transform Matrix = $\begin{bmatrix} 0.031 & -0.34 \\ -0.56 & 0.165 \\ 0.50 & -0.106 \\ 0.64 & 0.271 \end{bmatrix}_{4\times2}$

$d_{new_0} = d_0 \times$ Transformer $= [13.126 \quad -7.82]$

$d_{new_1} = d_1 \times$ Transformer $= [0.999 \quad -9.14]$

$d_{new_2} = [5.447 \quad 0.757]$

$d_{new_3} = [7.666 \quad 8.617]$

$d_{new_4} = [-5.21 \quad 5.883]$

$d_{new_5} = [-12.036 \quad -5.03]$

out matrix = $\begin{bmatrix} 13.126 & -7.82 \\ 0.996 & -9.14 \\ 5.447 & 0.752 \\ 7.666 & 8.617 \\ -5.21 & 5.883 \\ -12.036 & -5.03 \end{bmatrix}_{6\times2}$

WEC-S (2) $a^2+b^2=1$ $b=\sqrt{1-0.442}$