

## Lab 12

a)

$U = \begin{bmatrix} -0.70710678 & -0.70710678 \\ -0.70710678 & 0.70710678 \end{bmatrix}$

$S = \begin{bmatrix} 1.70082 & 0.25918 \end{bmatrix}$

$V = \begin{bmatrix} -0.70710678 & -0.70710678 \\ -0.70710678 & 0.70710678 \end{bmatrix}$

b)

$U_{reduce} = \begin{bmatrix} -0.70710678 & -0.70710678 \end{bmatrix}$

$z0 = U_{reduce} * x_{norm}(0) = \begin{bmatrix} -0.70710678 & -0.70710678 \end{bmatrix} * \begin{bmatrix} -0.518054 & -1.576784 \end{bmatrix} = \mathbf{1.48127416}$

$z1 = U_{reduce} * x_{norm}(1) = \begin{bmatrix} -0.70710678 & -0.70710678 \end{bmatrix} * \begin{bmatrix} 0.459154 & 0.831899 \end{bmatrix} = \mathbf{-0.91291233}$

c)

$X_{norm}[0] = U_{reduce} * z0 = \begin{bmatrix} -0.70710678 & -0.70710678 \end{bmatrix} * 1.48127416 =$   
 **$\begin{bmatrix} -1.047419 & -1.047419 \end{bmatrix}$**

$X_{norm}[1] = U_{reduce} * z1 = \begin{bmatrix} -0.70710678 & -0.70710678 \end{bmatrix} * -0.91291233 =$   
 **$\begin{bmatrix} 0.6455265 & 0.6455265 \end{bmatrix}$**