(4)

Given, measured data

$x_1 = 2.95$,

$x_2 = 1.74$,

$x_3 = -1.45$,

$x_4 = 1.32$

From the given eqn 7 we get the matrix A as

$$Ax = \begin{bmatrix} 1 & 0 & 0 & 0 \\ 0 & 1 & 0 & 0 \\ 0 & 0 & 1 & 0 \\ 0 & 0 & 0 & 1 \\ 1 & -1 & 0 & 0 \\ 1 & 0 & 0 & -1 \\ 0 & 1 & 0 & -1 \\ 1 & 0 & -1 & 0 \\ 0 & 1 & -1 & 0 \\ 0 & 0 & 1 & -1 \end{bmatrix} \begin{bmatrix} x_1' \\ x_2' \\ x_3' \\ x_4' \end{bmatrix} \simeq \begin{bmatrix} 2.95 \\ 1.74 \\ -1.45 \\ 1.32 \\ 1.23 \\ 1.61 \\ 0.45 \\ 4.45 \\ 3.21 \\ -2.75 \end{bmatrix} = b$$

A $\quad$ x $\quad$ b

Now $Ax = b$ is overdetermined, thus we compute least squares to find x.

*) Normal eqn $\Rightarrow$ $\quad A^T b = A^T A x$

$\Rightarrow$ $\quad x = (A^T A)^{-1} A^T b$

Thus from code, we get $x = \begin{bmatrix} 2.96 \\ 1.746 \\ -1.46 \\ 1.314 \end{bmatrix}$

The ~~direct measure~~ computed values are almost same as direct measurements.