2. Find the equation $f(x) = ax + b$ of the least square line for the points $(1, 0)$, $(-1, 2)$, $(2, 1)$.

$$\underset{A}{\begin{bmatrix} 1 & 1 \\ -1 & 1 \\ 2 & 1 \end{bmatrix}} \begin{bmatrix} a \\ b \end{bmatrix} = \underset{b}{\begin{bmatrix} 0 \\ 2 \\ 1 \end{bmatrix}}$$

$$A^TA = \begin{bmatrix} 1 & -1 & 2 \\ 1 & 1 & 1 \end{bmatrix} \begin{bmatrix} 1 & 1 \\ -1 & 1 \\ 2 & 1 \end{bmatrix} = \begin{bmatrix} 6 & 2 \\ 2 & 3 \end{bmatrix}$$

$$A^Tb = \begin{bmatrix} 1 & -1 & 2 \\ 1 & 1 & 1 \end{bmatrix} \begin{bmatrix} 0 \\ 2 \\ 1 \end{bmatrix} = \begin{bmatrix} 0 \\ 3 \end{bmatrix}$$

$$\begin{bmatrix} 6 & 2 \\ 2 & 3 \end{bmatrix} \begin{bmatrix} a \\ b \end{bmatrix} = \begin{bmatrix} 0 \\ 3 \end{bmatrix}$$

$$\left[\begin{array}{cc|c} 6 & 2 & 0 \\ 2 & 3 & 3 \end{array}\right] \to -2/6R_1 + R_2 \to \left[\begin{array}{cc|c} 6 & 2 & 0 \\ 0 & 7/3 & 3 \end{array}\right] 3/7R_2 \to \left[\begin{array}{cc|c} 6 & 2 & 0 \\ 0 & 1 & 9/7 \end{array}\right] -2R_2 + R_1 \to$$

$$\left[\begin{array}{cc|c} 6 & 0 & -18/7 \\ 0 & 1 & 9/7 \end{array}\right] \frac{1}{6}R_1 \to \left[\begin{array}{cc|c} 1 & 0 & -3/7 \\ 0 & 1 & 9/7 \end{array}\right]$$

$$\begin{bmatrix} a \\ b \end{bmatrix} = \begin{bmatrix} -3/7 \\ 9/7 \end{bmatrix}$$

$f(x) = -3/7x + 9/7$

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