□ Solution to NEq:

$$b^{(0)} = (X^TX)^{-} X^T y$$

where $(X^TX)^{-}$ is a generalized inverse of (X^TX)

Generalized Inverse

For matrix A, the matrix G is a generalized invers, if

$$AGA = A$$
$$(AGA)^T = A^T$$

Special case where A^{-1}
$\Rightarrow G = A^{-1}$

$$A \cdot G \cdot A = A \cdot A^{-1} \cdot A = A$$

System of equations: $\underbrace{A x}_{\text{unknowns}} = y \rightarrow$ right hand side

(Normal equations: $\underbrace{(X^TX)}_{A}\,\underbrace{b^{0}}_{x} = \underbrace{X^Ty}_{y}$

with G being a generalised inverse of (X^TX))