— Sherman - Morrison

i) A : square matrix

ii) u, v : vectors

$$(A + uv^\top)^{-1} = A^{-1} - \frac{A^{-1}uv^\top A^{-1}}{1 + v^\top A^{-1} u}$$

— Woodbury

i) A : square matrix

ii) $V, C, V)$ matrix

$$(A + UCV)^{-1} = A^{-1} - A^{-1}UC(C^{-1} + VA^{-1}U)^{-1}VA^{-1}$$

— Partitioned Matrix

$$\begin{bmatrix} A_{11} & A_{12} \\ A_{21} & A_{22} \end{bmatrix}^{-1} = \begin{bmatrix} A_{11}^{-1}(I + A_{12}FA_{11}^{-1}) & -A_{11}^{-1}A_{12}F \\ -FA_{21}A_{11}^{-1} & F \end{bmatrix}$$

$$F = (A_{22} - A_{21}A_{11}^{-1}A_{12})^{-1}$$

or

$$F = (A_{11} - A_{12}A_{22}^{-1}A_{21})^{-1}$$

— If matrix A has an Inverse Matrix

$$Ax = b$$

$\hookrightarrow$ $A^{-1}Ax = A^{-1}b$

$\hookrightarrow$ $Ix = A^{-1}b$

$\hookrightarrow$ $\boxed{x = A^{-1}b}$