

## Step-1

Given that Elimination for a 2 by 2 block matrix:

When  $A^{-1}A = I$ , multiply the first block row by  $CA^{-1}$  and subtract from the second row, to find the Schur complement  $S$ :

$$\begin{bmatrix} I & 0 \\ -CA^{-1} & I \end{bmatrix} \begin{bmatrix} A & B \\ C & D \end{bmatrix} = \begin{bmatrix} A & B \\ 0 & S \end{bmatrix}.$$

## Step-2

Since by multiplying the first row with  $CA^{-1}$  and then subtract from row 2, we have

the Schur complement  $S$  is  $S = \boxed{D - CA^{-1}B}$ .