

FORWARD SUBSTITUTION

Should be 'x's'

$$\begin{bmatrix} a_{00} & 0 & 0 & 0 \\ a_{10} & a_{11} & 0 & 0 \\ a_{20} & a_{21} & a_{22} & 0 \\ a_{30} & a_{31} & a_{32} & a_{33} \end{bmatrix} \begin{bmatrix} x_0 \\ x_1 \\ x_2 \\ x_3 \end{bmatrix} = \begin{bmatrix} b_0 \\ b_1 \\ b_2 \\ b_3 \end{bmatrix}$$

Look at
Summations
last!

STEP 1 : $i=0$ $a_{00} x_0 = b_0 \rightarrow x_0 = \frac{b_0}{a_{00}}$

STEP 2 : $i=1$ $a_{10} x_0 + a_{11} x_1 = b_1$
 $\rightarrow x_1 = \frac{b_1 - a_{10} x_0}{a_{11}}$

$\sum_{j=0}^{i-1} a_{ij} x_j$

STEP 3 : $i=2$ $a_{20} x_0 + a_{21} x_1 + a_{22} x_2 = b_2$
 $\rightarrow x_2 = \frac{b_2 - (a_{20} x_0 + a_{21} x_1)}{a_{22}}$

$\sum_{j=0}^{i-1} a_{2j} x_j$

STEP 4 : $i=3$ $a_{30} x_0 + a_{31} x_1 + a_{32} x_2 + a_{33} x_3 = b_3$
 $\rightarrow x_3 = \frac{b_3 - (a_{30} x_0 + a_{31} x_1 + a_{32} x_2)}{a_{33}}$

$\sum_{j=0}^{i-1} a_{3j} x_j$

① Need loop for STEPS 1-4.

for $i = 0, 1, 2, 3$

for $i = 0, 1, 2, \dots, n-1$ [General Version]

In general

$\sum_{j=0}^{i-1} a_{ij} x_j$

② Need loop for summation

~~for $j = 0, 1, 2$~~

for $j = 0, 1, \dots, i-1$

This will execute for each i value