

## Step-1

Consider  $x_1 = x_0 + y$ . Here  $LUy = r$ , where  $r = b - Ax_0$ . We get

$$\begin{aligned}x_1 &= x_0 + y \\LUx_1 &= LUx_0 + LUy \\&= LUx_0 + r \\LUx_1 &= LUx_0 + b - Ax_0 \\&= (LU - A)x_0 + b\end{aligned}$$

## Step-2

Comparing this with  $Sx_1 = Tx_0 + b$ , we get

$$\boxed{\begin{aligned}S &= LU \\T &= LU - A\end{aligned}}$$

It should be clear that  $T$  is very small.