

## Step-1

We have to find that for which numbers  $c$  is  $A = LU$  impossible with three pivots.

$$A = \begin{pmatrix} 1 & 2 & 0 \\ 3 & c & 1 \\ 0 & 1 & 1 \end{pmatrix}$$

Given matrix

Subtracting 3 times row 1 from row 2 gives

$$= \begin{pmatrix} 1 & 2 & 0 \\ 0 & c-6 & 1 \\ 0 & 1 & 1 \end{pmatrix}$$

## Step-2

Now if  $c = 6$ , then the second pivot becomes 0.

We know that if any element in the pivot position is zero then LU factorization is not possible, so if  $c = 6$  then LU is impossible.