A=>

A E 112 nxn

Aim: To esquess A as LV where L is lower triongle and V is upper triongle.

=) Now we multiply A with a series of lower become an upper triangular matrix.

Each each hij will be surportable for converting the i,jth element of A to U.

We do this sequentially as bollows:

$$\begin{bmatrix} \times & \times & \times \\ \times & \times & \times \\ \times & \times & \times \end{bmatrix} \longrightarrow \begin{bmatrix} \times & \times & \times \\ 0 & \times & \times \\ \times & \times & \times \end{bmatrix} \longrightarrow \begin{bmatrix} \times & \times & \times \\ 0 & \times & \times \\ 0 & \times & \times \end{bmatrix}$$

$$\downarrow_{21} A$$

$$\downarrow_{21} A$$

Now we have.

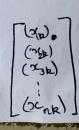
[32 L31 L21 A = U

we have L = (L32L31L21)-1

We will show that

Lies indeed a lower triongular

Let  $X_{2}$  be the k column of A after birth k-1 column have been processed



 $\begin{bmatrix} \times & \times & \times \\ \bigcirc & \times & \times \\ \bigcirc & \bigcirc & \times \end{bmatrix} \leftarrow$ 

L32L31L21A

Let Lyk = schk killy & n Then the moteuse Lik (RHZiEn) is as bollows ith now -> -- -- Like Rest all enterios 12 th column When we have  $L_k = L_{n,k} \cdot L_{n-1,k}$ kar column. pultiplying all euch I gives  $\widehat{1}_{n-1} \cdot \widehat{1}_{n-2} \cdot \widehat{1}_{1} = \begin{bmatrix} 1 \\ -1_{21} & 1 \\ -1_{3,1} & -1_{3,2} \\ -1_{4,1} & -1_{4,2} & 1 \end{bmatrix}$   $(-1_{n+1}, p)$ -ln,1 -ln,2 (ln,12) (-ln,n) And the inverse of this can be

obtained by Replacing all -lik with like (înînz. ?) = 2I - (înînz. ?. î) which is lower biongulor modeine L.