

To achieve this form of A , we can perform row operations.

For eg. to make $a_{21} = 0$

$$\text{perform } R_2 = R_2 - (\text{factor}) * R_1$$

$$\text{where factor} = \frac{a_{21}}{a_{11}}$$

Carrying out this process for all the rows would give us REF of A .

PIVOTING

while calculating factor, we need to make sure that the denominator doesn't equals to 0. To do this we ensure that

$$\cancel{a_{ii} > a_{ji} \quad \forall j \geq i+1} \\ a_{ii} \neq 0$$

else we replace the row with another row where $a_{ji} \neq 0$.

Largest diagonal element

To ensure that there is minimum error in calculation

$$a_{ii} > a_{ji} \quad \forall j \geq i+1$$