Step-1

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Suppose a typical matrix is $A=\begin{bmatrix} a_{11} & a_{12} & - & a_{1n} \\ a_{21} & a_{ij} & - & a_{2n} \\ - & - & - & - \\ a_{n1} & a_{n2} & - & a_{nn} \end{bmatrix}$ is an $n\times n$ matrix.

We know by definition that A^T is an $n\times n$ matrix such that *ij*th entry b_{ij} of A^T is nothing but the *ji*th entry a_{ji} of *A*.

$$A^T=\begin{bmatrix} a_{11} & a_{21} & - & a_{n1} \\ a_{12} & a_{ji} & - & a_{n2} \\ - & - & - & - \\ a_{1n} & a_{2n} & - & a_{nn} \end{bmatrix}$$

Step-2

Now, to reorder the rows of *A*, we use the interchange of rows R_i and R_j

Then we follow that except the *ij*th entry of ith row and jth column, every other entry will be different from the entries of the same row or same column.

So, this reordering of *A* left the matrix different from A^T .

Similarly, any reordering of the rows and columns of *A* leave the other entries in the respective positions different.

Thus, the reordering of *A* and the transposition of *A* are different matrices.