Inverse relations:

$R^{-1} = \{(b,a) : (a,b) \in R\}$

Example 1 :

Let R be the following relation on A ={1,2,3}

$R = \{(1,2),(1,3),(2,3)\}$

$\therefore R^{-1} = \{(2,1),(3,1),(3,2)\}$

The matrix for R :

$$M_R = \begin{bmatrix} 0 & 1 & 1 \\ 0 & 0 & 1 \\ 0 & 0 & 0 \end{bmatrix}.$$

$$M_{R^{-1}} = \begin{bmatrix} 0 & 0 & 0 \\ 1 & 0 & 0 \\ 1 & 1 & 0 \end{bmatrix}.$$

MR^{-1} is the transpose of matrix R.