Co-factor matrix and Adjoint (Adjugate) matrix

- Let $A = [a_{ij}]_n$ be a square matrix

  $C = [c_{ij}]_n$, where c_{ij} is co factor of a_{ij} , $\forall\ i\ \&\ j$

  $adj\ (A) = [d_{ij}]_n$, where $d_{ij} = c_{ji}$, $\forall\ i\ \&\ j$

  $$A = \begin{bmatrix} a_{11} & a_{12} \\ a_{21} & a_{22} \end{bmatrix}\ ,\ C = \begin{bmatrix} c_{11} & c_{12} \\ c_{21} & c_{22} \end{bmatrix}$$

  $$adj\ (A) = C^T = \begin{bmatrix} c_{11} & c_{21} \\ c_{12} & c_{22} \end{bmatrix} = \begin{bmatrix} a_{22} & -a_{12} \\ -a_{21} & a_{11} \end{bmatrix}$$

  Note:

  For $A = \begin{bmatrix} a_{11} & a_{12} \\ a_{21} & a_{22} \end{bmatrix}$ $\quad adj\ (A) = \begin{bmatrix} a_{22} & -a_{12} \\ -a_{21} & a_{11} \end{bmatrix}$

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