VD 7.5.2

Let $A=\left[a_{ij}\right]$ be a matrix of dimension mxn. A^T is the transpose of A . if $A^T=\left(b_{ij}\right)$ then $b_{ij}=a_{ji}$.

(a) Given matrix x ,write x^T

(b) Given matrix M , find xM

(c) Find products: xMx^T and xM^Tx^T

x	M	x^T	xM	xMx^T	xM^Tx^T
$\begin{pmatrix}-1 & 0 & 1\end{pmatrix}$	$\begin{pmatrix}\frac{\sqrt{2}}{2} & 0 & \frac{\sqrt{2}}{2}\\ 0 & 1 & 0\\ -\frac{\sqrt{2}}{2} & 0 & \frac{\sqrt{2}}{2}\end{pmatrix}$	$\begin{pmatrix}-1\\0\\1\end{pmatrix}$	$\begin{pmatrix}-\sqrt{2} & 0 & 0\end{pmatrix}$	$\sqrt{2}$	$\sqrt{2}$
$\begin{pmatrix}2 & 0 & 3\end{pmatrix}$	$\begin{pmatrix}1 & \frac{1}{2} & 0\\ 0 & -1 & 1\\ 1 & 0 & 0\end{pmatrix}$	$\begin{pmatrix}2\\0\\3\end{pmatrix}$	$\begin{pmatrix}5 & 1 & 0\end{pmatrix}$	10	10
$\begin{pmatrix}-1 & 2 & 0\end{pmatrix}$	$\begin{pmatrix}0 & 0 & 0\\ 1 & 2 & 1\\ 3 & 4 & 0\end{pmatrix}$	$\begin{pmatrix}-1\\2\\0\end{pmatrix}$	$\begin{pmatrix}2 & 4 & 2\end{pmatrix}$	6	6
$\begin{pmatrix}4 & 3 & 2\end{pmatrix}$	$\begin{pmatrix}0 & \frac{1}{2} & -2\\ 1 & 0 & \frac{2}{3}\\ -\frac{1}{4} & \frac{1}{2} & 0\end{pmatrix}$	$\begin{pmatrix}4\\3\\2\end{pmatrix}$	$\begin{pmatrix}\frac{5}{2} & 3 & 14\end{pmatrix}$	47	47
$\begin{pmatrix}1 & 2 & 1\end{pmatrix}$	$\begin{pmatrix}2 & 0 & 0\\ 1 & 3 & 0\\ 0 & 1 & -1\end{pmatrix}$	$\begin{pmatrix}1\\2\\1\end{pmatrix}$	$\begin{pmatrix}4 & 7 & -1\end{pmatrix}$	17	17

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$\begin{pmatrix} -1 & 3 & -5 \end{pmatrix}$	$\begin{pmatrix} 1 & \frac{1}{2} & 0 \\ 0 & -4 & 1 \\ 3 & \frac{1}{2} & 1 \end{pmatrix}$	$\begin{pmatrix} -1 \\ 3 \\ -5 \end{pmatrix}$	$\begin{pmatrix} -16 & -15 & -2 \end{pmatrix}$	-19	-19
$\begin{pmatrix} 0 & 1 & -3 \end{pmatrix}$	$\begin{pmatrix} 1 & 2 & -1 \\ \frac{2}{3} & 0 & 3 \\ \frac{1}{3} & 1 & 4 \end{pmatrix}$	$\begin{pmatrix} 0 \\ 1 \\ -3 \end{pmatrix}$	$\begin{pmatrix} -\frac{1}{3} & -3 & -9 \end{pmatrix}$	24	24