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(%i1) load(vector);
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(%o1) /usr/share/maxima/5.34.1/share/vector/vector.mac
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(%i2) load(eigen);
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(%o2) /usr/share/maxima/5.34.1/share/matrix/eigen.mac
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(%i3) X: entermatrix(6, 4);
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Row1Column1 : cos(0); Row1Column2 : sqrt(1/2)*cos(atan(1/2)*1); Row1Column3 : sqrt(1/4)*cos(atan(1/2)*2); Row1Column4 : sqrt(1/8)*cos(atan(1/2)*3); Row2Column1 : sin(0); Row2Column2 : sqrt(1/2)*sin(atan(1/2)*1); Row2Column3 : sqrt(1/4)*sin(atan(1/2)*2); Row2Column4 : sqrt(1/8)*sin(atan(1/2)*3); Row3Column1 : cos(0); Row3Column2 : (1/2)*cos(atan(1)*1); Row3Column3 : (1/4)*cos(atan(1)*2); Row3Column4 : (1/8)*cos(atan(1)*3); Row4Column1 : sin(0); Row4Column2 : (1/2)*sin(atan(1)*1); Row4Column3 : (1/4)*sin(atan(1)*2); Row4Column4 : (1/8)*sin(atan(1)*3); Row5Column1 : cos(0); Row5Column2 : (1/4)*cos(atan(2)*1); Row5Column3 : (1/16)*cos(atan(2)*2); Row5Column4 : (1/64)*cos(atan(2)*3); Row6Column1 : sin(0); Row6Column2 : (1/4)*sin(atan(2)*1); Row6Column3 : (1/16)*sin(atan(2)*2); Row6Column4 : (1/64)*sin(atan(2)*3); Matrixentered.

$$(\%o3) \begin{pmatrix} 1 & \frac{\sqrt{2}}{\sqrt{5}} & \frac{\cos(2 \operatorname{atan}(\frac{1}{2}))}{2} & \frac{\cos(3 \operatorname{atan}(\frac{1}{2}))}{2^{\frac{3}{2}}} \\ 0 & \frac{1}{\sqrt{2}\sqrt{5}} & \frac{\sin(2 \operatorname{atan}(\frac{1}{2}))}{2} & \frac{\sin(3 \operatorname{atan}(\frac{1}{2}))}{2^{\frac{3}{2}}} \\ 1 & \frac{1}{2^{\frac{3}{2}}} & 0 & -\frac{1}{2^{\frac{7}{2}}} \\ 0 & \frac{1}{2^{\frac{3}{2}}} & \frac{1}{4} & \frac{1}{2^{\frac{7}{2}}} \\ 1 & \frac{1}{4\sqrt{5}} & \frac{\cos(2 \operatorname{atan}(2))}{16} & \frac{\cos(3 \operatorname{atan}(2))}{64} \\ 0 & \frac{1}{2\sqrt{5}} & \frac{\sin(2 \operatorname{atan}(2))}{16} & \frac{\sin(3 \operatorname{atan}(2))}{64} \end{pmatrix}$$

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(%i4) numer: true;
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(%o4) true
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(%i5) XTi: expand(invert(transpose(X).X));
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$$(\%o5) \begin{pmatrix} 2.036432319085448 & -8.584896868075624 & 14.95793363793641 & -9.597524671882974 \\ -8.584896868075624 & 49.54821154725384 & -98.08727582473817 & 71.38053214229344 \\ 14.95793363793641 & -98.08727582473817 & 213.5349616890236 & -166.7176261116819 \\ -9.597524671882967 & 71.38053214229347 & -166.7176261116818 & 143.3140233489364 \end{pmatrix}$$

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(%i6) XT: expand(transpose(X));
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$$(\%o6) \begin{pmatrix} 1 & 0 & 1 & 0 & 0.1 \\ 0.6324555320336759 & 0.3162277660168379 & 0.3535533905932737 & 0.3535533905932737 & 0.1 \\ 0.3 & 0.3999999999999999 & 0 & 0.25 & -0.0 \\ 0.06324555320336761 & 0.3478505426185216 & -0.08838834764831838 & 0.08838834764831838 & -0.0 \end{pmatrix}$$

(%i7) Ideal: [0, 1, 0, 1, 0, 1];

(%o7) [0, 1, 0, 1, 0, 1]

(%i8) Multipliers: expand(CTXi.XT.Ideal);

(%o8)
$$\begin{pmatrix} -1.359077520000211 \\ 6.544131754820651 \\ -10.41823978709094 \\ 9.186744946055441 \end{pmatrix}$$

(%i9) Results: expand(X.Multipliers);

(%o9)
$$\begin{pmatrix} 0.2353436408175913 \\ 1.097754464893753 \\ 0.1426212443573589 \\ 0.521141229681596 \\ -0.3779648851750153 \\ 0.9167226236556833 \end{pmatrix}$$