

Blog Entry © Friday, October 11, 2024, by James Pate Williams, Jr. Free Vibrations of Simple Structures

The following example is from *Numerical Analysis an Algorithmic Approach 3rd Edition* © 1980 by S. D. Conte and Carl de Boor. The code for calculating the eigenvalues and eigenvectors is found in *A Numerical Library in C for Scientists and Engineers* by H. T. Lau, PhD. The mass matrix of the system is the identity matrix.

Data Input Dialog

A[1][1]	4	A[1][2]	-1	A[1][3]	-1	A[1][4]	-1
A[2][1]	-1	A[3][2]	4	A[2][3]	-1	A[3][4]	-1
A[3][1]	-1	A[3][2]	-1	A[3][3]	4	A[3][4]	-1
A[4][1]	-1	A[4][2]	-1	A[4][3]	-1	A[4][4]	4

OK Cancel

Results Dialog

Eigenvalues

+1.000000	+0.000000
+5.000000	+0.000000
+5.000000	+0.000000
+5.000000	+0.000000

Eigenvectors

+1.000000e+00	+0.000000e+00	+1.000000e+00	+0.000000e+00	+0.000000e+00	+0.000000e+00	+2.796874e-05	+0.000000e+00
+1.000000e+00	+0.000000e+00	-3.333333e-01	-0.000000e+00	-7.320508e-01	+0.000000e+00	-7.320906e-01	+0.000000e+00
+1.000000e+00	+0.000000e+00	-3.333333e-01	-0.000000e+00	+1.000000e+00	+0.000000e+00	-2.679374e-01	+0.000000e+00
+1.000000e+00	+0.000000e+00	-3.333333e-01	-0.000000e+00	-2.679492e-01	+0.000000e+00	+1.000000e+00	+0.000000e+00

OK Cancel