Details

Matrix balancing is usually called internally by LAPACK routines when there is large variation in the magnitude of matrix elements. Following matrix balancing the computed eigenvalues are expected to be more accurate but the resulting eigenvectors are not the correct eigenvectors of the original pre-balanced matrix. MatrixReverseBalance is then applied to the balanced eigenvectors in order to obtain the eigenvectors of the original matrix.

The operation uses outputs from MatrixBalance as inputs. Pass the W_scale output from MatrixBalance as the scaleWave parameter. Pass the V_min and V_max outputs from MatrixBalance as the /LH *low* and *high* parameters. See **MatrixBalance** for an example.

Output Variables

V_Flag	Set to zero when the operation succeeds. Otherwise, when V_flag is positive the value is a standard Igor error code. When V_flag is negative it is an indication of an invalid input parameter.

References

The operation uses the following LAPACK routines: sgebak, dgebak, cgebak, and zgebak.

See Also

MatrixBalance

MatrixSchur

MatrixSchur [**/Z**] ***srcMatrix***

The MatrixSchur operation computes for an NxN nonsymmetric srcMatrix, the eigenvalues, the real Schur form A and the matrix of Schur vectors V.

The Schur factorization has the form: S = V x A x (V^T), where V^T is the transpose (use V^H if S is complex) and x denotes matrix multiplication.

Flags

/Z	No error reporting.

Details

The operation creates:

M_A	Upper triangular matrix containing the Schur form A.
M_V	Unitary matrix containing the orthogonal matrix V of the Schur vectors.
W_REigenValues W_IEigenValues	Waves containing the real and imaginary parts of the eigenvalues when *srcMatrix* is a real wave. If *srcMatrix* is complex, the eigenvalues are stored in W_eigenValues.

The variable V_flag is set to 0 when there is no error; otherwise it contains the LAPACK error code.

Examples

You can test this operation for an N-by-N source matrix:

```
Make/D/C/N=(5,5) M_S=cmplx(enoise(1),enoise(1))
MatrixSchur M_S
MatrixOp/O unitary=(M_V^h) x M_V               // Check unitary
MatrixOp/O diff=abs(M_S-M_V x M_A x (M_V^H))   // Check decomposition
```

See Also

Matrix Math Operations on page III-138 for more about Igor's matrix routines and for background references with details about the LAPACK libraries.

MatrixSolve

MatrixSolve ***method***, ***matrixA***, ***vectorB***

The MatrixSolve operation was superseded by MatrixLLS and is included for backward compatibility only.

Used to solve matrix equation Ax=b using the method of your choice. Choices for *method* are: