

# Ponderosa Computing Linear Algebra Excel Add-ins

## Release Notes Version 1.3.0

Version date: 27 June 2020.

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### Features

These Excel Add-ins implement the following Excel worksheet functions:

<b>Scalar-Valued Matrix Metrics</b>	<b>Functions</b>
Determinant	LA.DET
1-norm (column norm)	LA.NORM1
2-norm (spectral norm)	LA.NORM2
Infinity-norm (row norm)	LA.NORMINF
Frobenius norm	LA.NORMF
Rank	LA.RANK
Spectral radius	LA.SRAD
Trace	LA.TRACE
1-norm inverse condition number	LA.ICNBR1

Infinity-norm inverse condition number	LA.ICNBRINF
<b>Linear System Solvers</b>	<b>Functions</b>
Square (full-rank) system solver	LA.SYS.SLV, LA.SYS.SLVE
General system solver (via LQ/QR)	LA.SYS.LS, LA.SYS.LSE
General system solver (via SVD)	LA.SYS.LSS, LA.SYS.LSSE
<b>Singular Value Decomposition</b>	<b>Functions</b>
Singular values	LA.SNGVL.C, LA.SNGVL.R,
Singular values with error bound	LA.SNGVLE.C, LA.SNGVLE.R
Left or right singular vectors	LA.LSNGVC, LA.RSNGVC
Full singular value decomposition	LA.SV
<b>Eigenvalues and Eigenvectors</b>	<b>Functions</b>
Eigenvalues	LA.EGNVL.C, LA.EGNVL.R
Eigenvalues with error bound	LA.EGNVLE.C, LA.EGNVLE.R
Eigenvalues and right eigenvectors	LA.REGNVC
<b>Cholesky Factorization</b>	<b>Functions</b>
Lower and upper Cholesky factorizations	LA.CHOL.L, LA.CHOL.U
<b>Matrix Creation and Extraction</b>	<b>Functions</b>
Create constant matrix	LA.GEN.CON, LA.RGN.CON
Create random matrix	LA.GEN.RAN, LA.RGN.RAN
Create identity matrix	LA.GEN.IDN
Create diagonal matrix	LA.GEN.DIAG
Extract diagonal elements	LA.XDIAG.C, LA.XDIAG.R
<b>Replacement Matrix Operations</b>	<b>Functions</b>

Matrix multiplication	LA.MUL
Matrix transpose multiplication	LA.TMUL, LA.MULT
Matrix transpose	LA.TRN

## Requirements

There are two Add-ins, PcLinAlgXLL\_32.xll and PcLinAlgXLL\_64.xll.

- Both require Microsoft Windows 7, 8, or 10.
- PcLinAlgXLL\_32.xll requires 32-bit Excel 2007 or later.
- PcLinAlgXLL\_64.xll requires 64-bit Excel 2010 or later.

## Implementation

The Ponderosa Computing Linear Algebra Excel Add-ins use the [CLAPACK](#) implementation of the LAPACK software package.

## Known Issues

1. These Excel XLL Add-ins were built using [CLAPACK](#) version 3.2.1. LAPACK enhancements and bug fixes implemented in subsequent versions of LAPACK have not yet been fully included in these Add-ins.

## Changes from Previous Versions

### From Release 1.2.0:

1. Both 32-bit Excel PcAlgLibXLL\_32.xll and 64-bit Excel PcAlgLibXLL\_64.xll installation packages are provided.
2. The add-in was built using the Visual Studio 2019 Platform Toolset v142. The corresponding Visual C++ Redistributable will be installed if necessary.

### From Release 1.1.2:

1. The add-in was built using Visual Studio 2017 Platform Toolset v141. The corresponding Visual C++ Redistributable will be installed if necessary.
2. Unneeded exported functions have been removed from the XLL.

### From Release 1.1.1:

1. A conflict between menu commands across multiple Add-ins has been corrected.

From Release 1.1.0:

1. The install package can be installed over the current version.
2. Custom installation dialog images were added.
3. The Excel add-in Registration Dialog has been removed and the About Dialog has been simplified.