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## Summary of Software for Linear Algebra Freely Available on the Web

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Tables 77.1 to Table 77.5 present a list of freely available software for the solution of linear algebra problems. The interest is in software for high-performance computers that is available in “open source” form on the Web for solving problems in numerical linear algebra, specifically dense, sparse direct and iterative systems, and sparse iterative eigenvalue problems.

Additional pointers to software can be found at:

[www.nhse.org/rib/repositories/nhse/catalog/#Numerical\\_Programs\\_and\\_Routines](http://www.nhse.org/rib/repositories/nhse/catalog/#Numerical_Programs_and_Routines)

A survey of Iterative Linear System Solver Packages can be found at:

[www.netlib.org/utk/papers/iterative-survey](http://www.netlib.org/utk/papers/iterative-survey).

**TABLE 77.1** Support Routines for Numerical Linear Algebra

Package	Support	Type		Language			Mode			
		Real	Complex	f77	c	c++	Seq	Dist	Dense	Sparse
ATLAS	yes	X	X	X	X		X		X	
BLAS	yes	X	X	X	X		X		X	
FLAME	yes	X	X	X	X		X		X	
LINALG	?									
MTL	yes	X				X	X		X	
NETMAT	yes	X				X	X		X	
NIST S-BLAS	yes	X	X	X	X		X			X
PSBLAS	yes	X	X	X	X		X	M		X
SparseLib++	yes	X	X		X	X	X			X
uBLAS	yes	X	X		X	X	X		X	

**TABLE 77.2** Available Software for Dense Matrix

Package	Support	Type		Language			Mode	
		Real	Complex	f77	c	c++	Seq	Dist
LAPACK	yes	X	X	X	X		X	
LAPACK95	yes	X	X	95			X	
NAPACK	yes	X		X				
PLAPACK	yes	X	X	X	X			M
PRISM	yes	X		X			X	M
ScaLAPACK	yes	X	X	X	X			M/P

**TABLE 77.3** Sparse Direct Solvers

Package	Support	Type		Language			Mode			
		Real	Complex	f77	c	c++	Seq	Dist	SPD	Gen
DSCPACK	yes	X			X		X	M	X	
HSL	yes	X	X	X			X		X	X
MFACT	yes	X			X		X		X	
MUMPS	yes	X	X	X	X		X	M	X	X
PSPASES	yes	X		X	X			M	X	
SPARSE	?	X	X		X		X		X	X
SPOOLES	?	X	X		X		X	M		X
SuperLU	yes	X	X	X	X		X	M		X
TAUCS	yes	X	X		X		X		X	X
UMFPACK	yes	X	X		X		X			X
Y12M	?	X		X			X		X	X

**TABLE 77.4** Sparse Eigenvalue Solvers

Package	Support	Type		Language			Mode			
		Real	Complex	f77	c	c++	Seq	Dist	Sym	Gen
(B/H)LZPACK	yes	X	X	X			X	M/P	X	X
HYPRE	yes	X			X		X	M	X	
QMRPACK	?	X	X	X			X		X	X
LASO	?	X		X			X		X	
P_ARPACK	yes	X	X	X			X	M/P		X
PLANSO	yes	X		X			X	M	X	
SLEPc	yes	X	X		X		X	M	X	X
SPAM	yes	X		90			X		X	
TRLAN	yes	X		X			X	M	X	

TABLE 77.5 Sparse Iterative Solvers

Package	Support	Type		Language			Mode		Precond.		Iterative Solvers	
		Real	Comp.	f77	c	c++	Seq	Dist	SPD	Gen	SPD	Gen
AZTEC	no	X			X		X	M	X	X	X	X
BILUM	yes	X		X			X	M		X		X
BlockSolve95	?	X		X	X	X		M	X	X	X	X
BPKIT	yes	X		X	X	X	X	M	X	X		
CERFACS	yes	X	X	X			X	M			X	X
HYPRE	yes	X		X	X		X	M	X	X	X	X
IML++	?	X		X	X	X	X				X	X
ITL	yes	X				X	X				X	X
ITPACK	?	X		X			X				X	X
LASPack	yes	X			X		X				X	X
LSQR	yes	X		X	X		X					X
pARMS	yes	X		X	X		X	M			X	X
PARPRE	yes	X			X			M	X	X		
PETSc	yes	X	X	X	X		X	M	X	X	X	X
P-SparsLIB	yes	X		X				M		X		X
PSBLAS	yes	X	X	f90	X		X	M	X	X	X	X
QMRPACK	?	X	X	X			X				X	X
SLAP	?	X		X						X		
SPAI	yes	X			X		X	M			X	X
SPLIB	?	X		X			X				X	X
SPOOLES	?	X	X		X		X	M	X	X	X	X
SYMMLQ	yes	X	X	X			X				X	X
TAUCS	yes	X	X		X		X		X	X	X	X
Templates	yes	X		X	X		X				X	X
Trilinos	yes	X				X	X	M	X	X	X	X

