References

The references collected here are those of general usefulness, usually cited in more than one section of this book. More specialized sources, usually cited in a single section, are not repeated here.

We first list a small number of books that form the nucleus of a recommended personal reference collection on numerical methods, numerical analysis, and closely related subjects. These are the books that we like to have within easy reach.

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Ames, W.F. 1977, *Numerical Methods for Partial Differential Equations*, 2nd ed. (New York: Academic Press)

Bratley, P., Fox, B.L., and Schrage, E.L. 1983, *A Guide to Simulation* (New York: Springer-Verlag)

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Delves, L.M., and Mohamed, J.L. 1985, *Computational Methods for Integral Equations* (Cambridge, U.K.: Cambridge University Press)

Dennis, J.E., and Schnabel, R.B. 1983, *Numerical Methods for Unconstrained Optimization and Nonlinear Equations* (Englewood Cliffs, NJ: Prentice-Hall)

Gill, P.E., Murray, W., and Wright, M.H. 1991, *Numerical Linear Algebra and Optimization*, vol. 1 (Redwood City, CA: Addison-Wesley)

Golub, G.H., and Van Loan, C.F. 1989, *Matrix Computations*, 2nd ed. (Baltimore: Johns Hopkins University Press)

Oppenheim, A.V., and Schafer, R.W. 1989, *Discrete-Time Signal Processing* (Englewood Cliffs, NJ: Prentice-Hall)

Ralston, A., and Rabinowitz, P. 1978, *A First Course in Numerical Analysis*, 2nd ed. (New York: McGraw-Hill)

Sedgewick, R. 1988, *Algorithms*, 2nd ed. (Reading, MA: Addison-Wesley)

Stoer, J., and Bulirsch, R. 1980, *Introduction to Numerical Analysis* (New York: Springer-Verlag)

Wilkinson, J.H., and Reinsch, C. 1971, *Linear Algebra*, vol. II of *Handbook for Automatic Computation* (New York: Springer-Verlag)

We next list the larger collection of books, which, in our view, should be included in any serious research library on computing, numerical methods, or analysis.

Bevington, P.R. 1969, *Data Reduction and Error Analysis for the Physical Sciences* (New York: McGraw-Hill)

Bloomfield, P. 1976, *Fourier Analysis of Time Series – An Introduction* (New York: Wiley)

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Brent, R.P. 1973, *Algorithms for Minimization without Derivatives* (Englewood Cliffs, NJ: Prentice-Hall)

Brigham, E.O. 1974, *The Fast Fourier Transform* (Englewood Cliffs, NJ: Prentice-Hall)

Brownlee, K.A. 1965, *Statistical Theory and Methodology*, 2nd ed. (New York: Wiley)

Bunch, J.R., and Rose, D.J. (eds.) 1976, *Sparse Matrix Computations* (New York: Academic Press)

Canuto, C., Hussaini, M.Y., Quarteroni, A., and Zang, T.A. 1988, *Spectral Methods in Fluid Dynamics* (New York: Springer-Verlag)

Carnahan, B., Luther, H.A., and Wilkes, J.O. 1969, *Applied Numerical Methods* (New York: Wiley)

Champeney, D.C. 1973, *Fourier Transforms and Their Physical Applications* (New York: Academic Press)

Childers, D.G. (ed.) 1978, *Modern Spectrum Analysis* (New York: IEEE Press)

Cooper, L., and Steinberg, D. 1970, *Introduction to Methods of Optimization* (Philadelphia: Saunders)

Dantzig, G.B. 1963, *Linear Programming and Extensions* (Princeton, NJ: Princeton University Press)

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Dongarra, J.J., et al. 1979, *LINPACK User's Guide* (Philadelphia: S.I.A.M.)

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Forsythe, G.E., Malcolm, M.A., and Moler, C.B. 1977, *Computer Methods for Mathematical Computations* (Englewood Cliffs, NJ: Prentice-Hall)

Forsythe, G.E., and Moler, C.B. 1967, *Computer Solution of Linear Algebraic Systems* (Englewood Cliffs, NJ: Prentice-Hall)

Gass, S.T. 1969, *Linear Programming*, 3rd ed. (New York: McGraw-Hill)

Gear, C.W. 1971, *Numerical Initial Value Problems in Ordinary Differential Equations* (Englewood Cliffs, NJ: Prentice-Hall)

Goodwin, E.T. (ed.) 1961, *Modern Computing Methods*, 2nd ed. (New York: Philosophical Library)

Gottlieb, D. and Orszag, S.A. 1977, *Numerical Analysis of Spectral Methods: Theory and Applications* (Philadelphia: S.I.A.M.)

Hackbusch, W. 1985, *Multi-Grid Methods and Applications* (New York: Springer-Verlag)

Hamming, R.W. 1962, *Numerical Methods for Engineers and Scientists*; reprinted 1986 (New York: Dover)

Hart, J.F., et al. 1968, *Computer Approximations* (New York: Wiley)

Hastings, C. 1955, *Approximations for Digital Computers* (Princeton: Princeton University Press)

Hildebrand, F.B. 1974, *Introduction to Numerical Analysis*, 2nd ed.; reprinted 1987 (New York: Dover)

Hoel, P.G. 1971, *Introduction to Mathematical Statistics*, 4th ed. (New York: Wiley)

Horn, R.A., and Johnson, C.R. 1985, *Matrix Analysis* (Cambridge: Cambridge University Press)

Householder, A.S. 1970, *The Numerical Treatment of a Single Nonlinear Equation* (New York: McGraw-Hill)

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Koonin, S.E., and Meredith, D.C. 1990, *Computational Physics, Fortran Version* (Redwood City, CA: Addison-Wesley)

Kuenzi, H.P., Tzschach, H.G., and Zehnder, C.A. 1971, *Numerical Methods of Mathematical Optimization* (New York: Academic Press)

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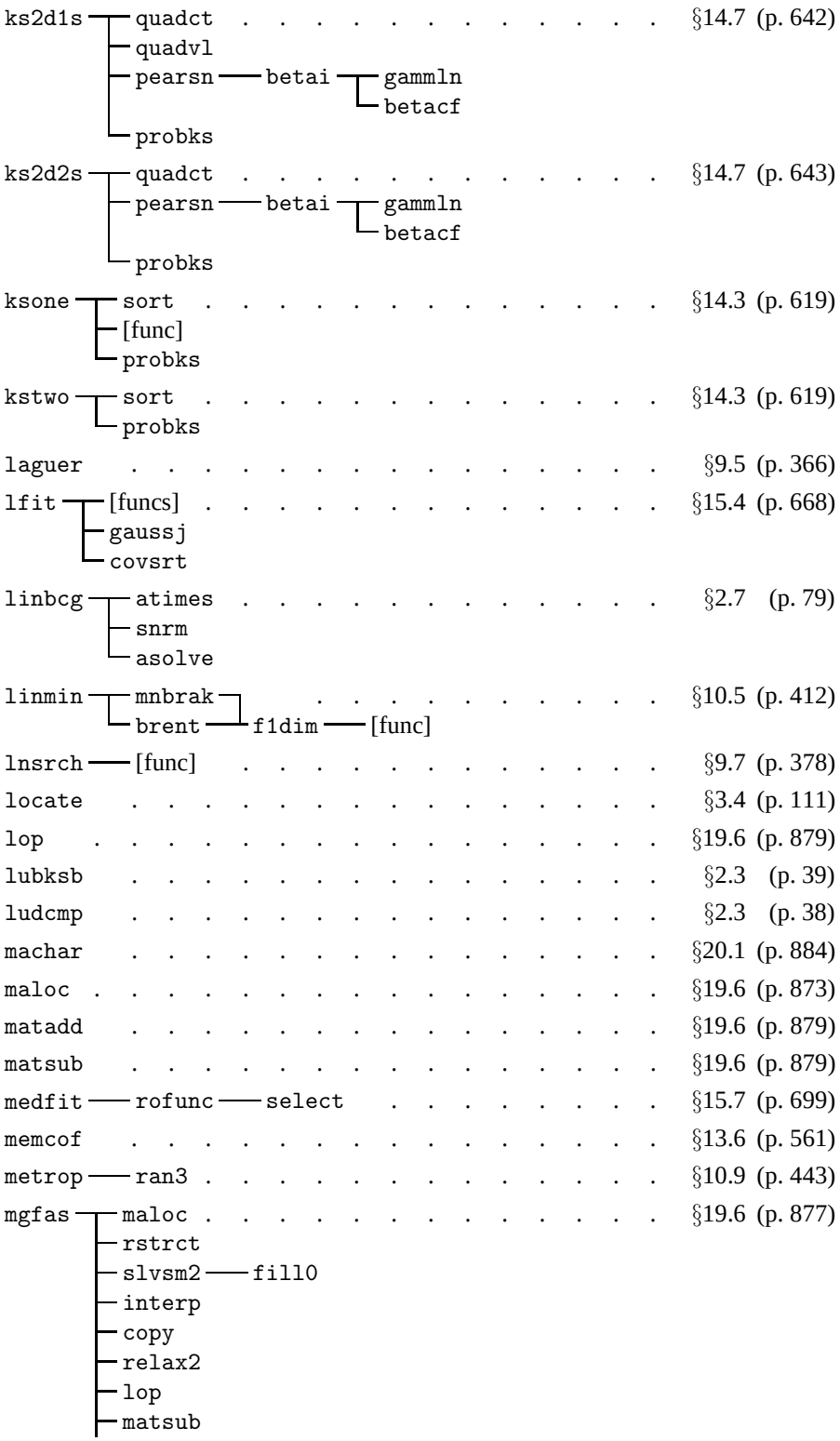
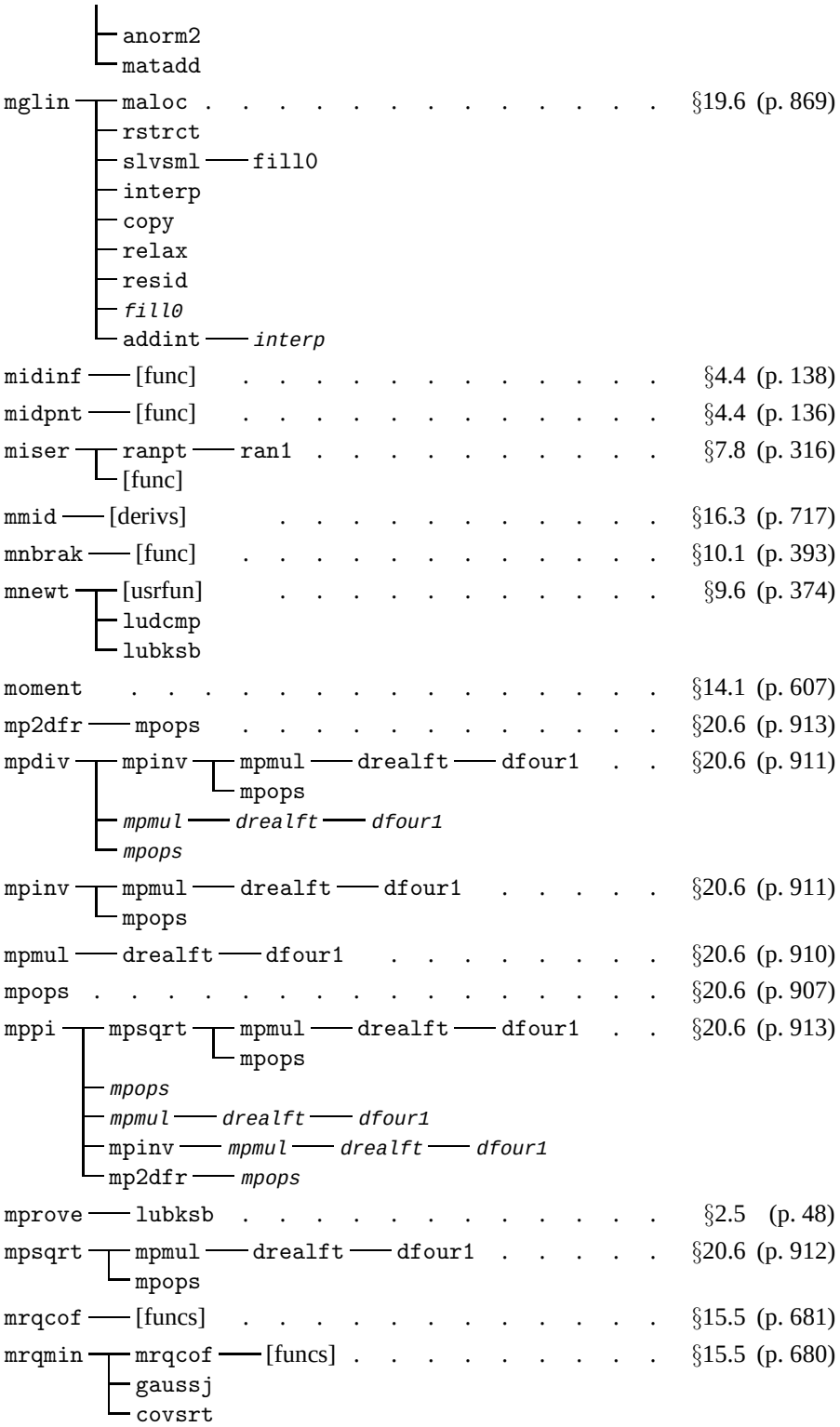
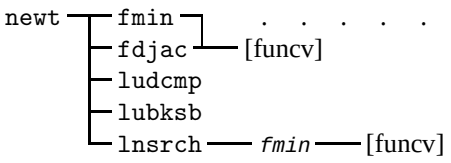
Young, D.M., and Gregory, R.T. 1973, *A Survey of Numerical Mathematics*, 2 vols.; reprinted 1988 (New York: Dover)

Index of Programs and Dependencies

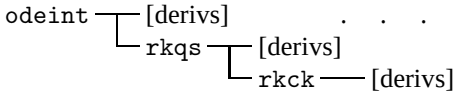
The following table lists, in alphabetical order, all the routines in *Numerical Recipes*. When a routine requires subsidiary routines, either from this book or else user-supplied, the full dependency tree is shown: A routine calls directly all routines to which it is connected by a solid line in the column immediately to its right; it calls indirectly the connected routines in all columns to its right. Typographical conventions: Routines from this book are in typewriter font (e.g., `eulsum`, *`gammln`*). The smaller, slanted font is used for the second and subsequent occurences of a routine in a single dependency tree. (When you are getting routines from the *Numerical Recipes* diskettes, or their archive files, you need only specify names in the larger, upright font.) User-supplied routines are indicated by the use of text font and square brackets, e.g., [funcv]. Consult the text for individual specifications of these routines. The right-hand side of the table lists section and page numbers for each program.





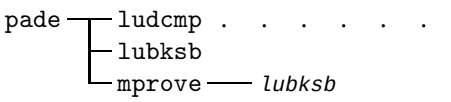


newt §9.7 (p. 379)



odeint §16.2 (p. 714)

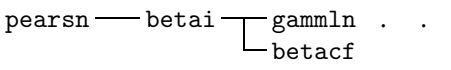
orthog §4.5 (p. 153)



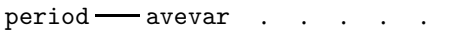
pade §5.12 (p. 196)

pccheb §5.11 (p. 193)

pcshft §5.10 (p. 192)



pearsn §14.5 (p. 632)



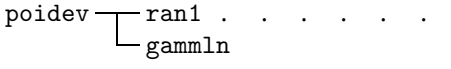
period §13.8 (p. 572)

piksr2 §8.1 (p. 322)

piksrt §8.1 (p. 321)

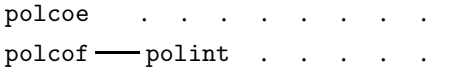
pinvs §17.3 (p. 762)

plgndr §6.8 (p. 247)



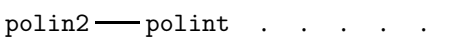
poidev §7.3 (p. 284)

polcoe §3.5 (p. 114)



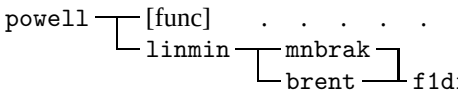
polcof §3.5 (p. 115)

poldiv §5.3 (p. 169)



polin2 §3.6 (p. 118)

polint §3.1 (p. 103)



powell §10.5 (p. 411)

predic §13.6 (p. 562)

probks §14.3 (p. 620)

psdes §7.5 (p. 293)

pwt §13.10 (p. 589)

pwtset §13.10 (p. 589)

pythag §2.6 (p. 62)

pzextr §16.4 (p. 724)

qgaus §4.5 (p. 141)

qrdcmp §2.10 (p. 92)