**Section 5.10. Incomplete Factorizations**

**Note.** In this brief (three paragraph) section, Gentle discusses approximating factorizations with “incomplete factorizations.” As an example, we might approximate an LU factorization of $A$ as $A \approx \tilde{L}\tilde{U}$ where we take $\tilde{\ell}_{ij} = \tilde{u}_{ij} = 0$ if $a_{ij} = 0$ (here, $A$ is a “sparse matrix”; that is, one with many 0 entries). Since there is no discussion of matrix metrics in this setting, there is no way to address the accuracy of the approximations.

**Note.** Gentle gives a modification of Gaussian elimination for use in approximations in equation (5.44), but notice that there are typographical errors in this, as revealed in the “Errata and Clarifications” website: [http://mason.gmu.edu/~jgentle/books/matbk/materrata.htm](http://mason.gmu.edu/~jgentle/books/matbk/materrata.htm).

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