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J J Tattersall* (tat@providence.edu), Department of Mathematics, 1 Cunningham Square,
Providence, RI 02918. *An extended Euclidean algorithm.*

The greatest common divisor has many significant mathematical applications, finding inverses in modular arithmetic, computing continued fractions, solving linear Diophantine equations, and decrypting and encrypting exponential ciphers. Given two integers, most textbooks illustrate the ancient Euclidean algorithm to find the greatest common divisor, then by working the steps of the algorithm backwards, the greatest common divisor can be expressed it as a linear combination of the two given numbers. While effective, the Euclidean approach can put an algebraic strain on students. A more innovative technique, Saunderson's algorithm, offers a much more efficient approach to the problem. In the 1740 edition of {Elements of Algebra}, Nicholas Saunderson, the blind Lucasian Professor, introduced an extended Euclidean algorithm to determine the greatest common divisor of two positive integers and simultaneously express the greatest common divisor as a linear combination of the two numbers. We explain the method and illustrate it with an example. (Received September 14, 2017)