

algorithm — a procedure that unambiguously describes a finite, ordered sequence of steps to solve a problem or approximate a solution.

stable algorithm — small changes in initial data produce small changes in the final results

unstable algorithm — not stable

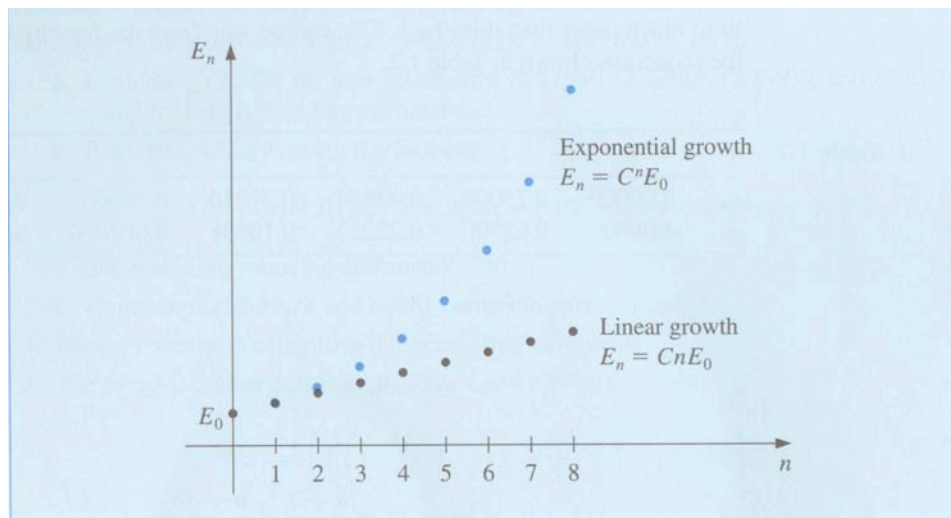
conditionally stable algorithm — stable only for certain choices of initial data

Growth of round-off error:

Suppose an error $E_0 > 0$ is introduced at some stage of the calculations and the error after n subsequent operations is E_n .

linear growth of (relative) error — $E_n \approx CnE_0$, where C is a constant independent of n . This reflects a stable algorithm.

exponential growth of (relative) error — $E_n \approx C^n E_0$ for some $C > 1$. This reflects an unstable algorithm.



MAPLE. See [convergence.mw](#) and/or [convergence.pdf](#).