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Robert A. Mayans* (mayans@fd.edu), Robert Mayans, Department of Math/CSci/Physics, Fairleigh Dickinson University, M-AB2-02, Madison, NJ. *An Applet-Based Presentation of the Chebyshev Equioscillation Theorem.*

For a continuous function f on a closed interval $[a, b]$, a polynomial p_n is a *best approximating polynomial* if it minimizes, among all polynomials of degree $\leq n$, the sup-norm distance between f and the polynomial. The Chebyshev theorem describes a striking pattern of the best approximating polynomial: if E is the distance between f and this polynomial, then the polynomial overestimates and underestimates the function by E , in an alternating pattern, at least $n + 2$ times, and it is the unique polynomial to do so. The proof of this theorem is not straightforward and is frequently omitted from the undergraduate numerical analysis course. We present a proof of the theorem using a sequence of applets to illustrate the ideas of the proof. (Received September 14, 2006)