962-J1-76   **M. R.S. Kulenovic*** (`kulenm@math.uri.edu`), Department of Mathematics, University of Rhode Island, Kingston, RI 02881, and **Orlando Merino** (`merino@math.uri.edu`), Department of Mathematics, University of Rhode Island, Kingston, RI 02881. *Dynamica-A computer package for the study of Difference Equations and Discrete Dynamical Systems.*

Dynamica is a computer package, written in Mathematica, intended for use in the study of difference equations and discrete dynamical systems. Because of the nature of the field, difference equations provide a great opportunity for undergraduate students to do research in mathematics. This chance is greatly enhanced with Dynamica, since with it students quickly get a feel for the concepts and techniques of difference equations, and just as fast they are in position to explore research questions. Dynamica is an effective teaching and research tool at either introductory (sophomore, junior) or more advanced (senior, graduate) levels. Dynamica implements a series of tools and techniques of algebraic, numerical, and graphical nature used in the study of difference equations such as finding equilibrium and periodic points, stability analysis of equilibrium and periodic points, semicycle analysis of solutions, calculation and visualization of invariants (first integrals), calculation and visualization of Lyapunov functions, plotting bifurcation diagrams, visualization of stable and unstable manifolds, etc. In this presentation we use Dynamica to find an invariant and a Lyapunov function of a difference equation, and also study stability of equilibria. (Received July 24, 2000)