1014-06-485 **R. J. Greechie*** (greechie@latech.edu), P.O. Box 10348, Louisiana Tech University, Railroad Avenue, Ruston, LA 71272, and **M. F. Janowitz** (melj@dimacs.rutgers.edu), 428 CoRE Building, DIMACS, Rutgers, The State University, 96 Freylinghuysen Road, Piscataway, NJ 08854-8018. *Residuated Approximations and their Connection to Cluster Analysis.* Preliminary report.

Clustering of data sets must often be based on measurements taking place in ordered structures more general than the non-negative reals. This leads naturally to the study of residuated mappings from poset P to poset Q, and generalizations thereof. When the posets are complete lattices, we study the residuated approximation ρ_f of a map $f\colon P \to Q$; ρ_f is the largest residuated mapping dominated by f. If P is a completely distributive lattice we give a formula showing how ρ_f may be calculated from f; and, in the finite case, present an algorithm for computing ρ_f. This formula, the algorithm, and other results are based on the study of the mappings $f^{(+)}$ and $f^{(-)}$ defined (when possible) for $q \in Q$ by $f^{(+)}(q) = \bigvee\{p \in P : f(p) \leq q\}$, and dually $f^{(-)}(q) = \bigwedge\{p \in P : f(p) \geq q\}$. If $k \leq f$ is residuated, then $k \leq f^{(+)(-)} = (f^{(+)})^{(-)} = \sigma_f$. The map σ_f is called the *shadow* of f. It was introduced and studied in 1988 by H. Andréka, R. J. Greechie, and G. E Strecker. (Received September 18, 2005)