Transposed Matrices in Archaeological Seriation to Analyze Aging and Distance between Archaeological Features in an Integrated Development Environment

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There are numerous mathematical systems that are implemented in the process of archaeological seriation. Archeological seriation is a relative dating process in which assemblages are placed in a chronological line. Methods commonly used for archaeological seriation are costly and extensive, causing research in this area to be undermined. The most commonly used matrix seriation process is not automated however, the automation of this process could reduce time and cost of research in this area. Since a transposed matrix is a set of numerical data inverted from its original matrix arrangement then the development of a computer program for the process of archaeological seriation is possible if the original matrix has a representation of cultural groups of the assemblages. The here designed program uses a 3x3 matrix arrangement for the left to right organization of the assemblages dependent on the time of the discovery. A matrix seriation process was performed, and directly compared to the results from the here designed program. In this comparison nine objects were studied from an archaeological site. The objects were divided into two cultural groups, represented as either 1(ceramics) or 0 (other objects). The designed program showed a time reduction of 80% when compared to the not automated matrix seriation process. Cost efficiency estimations show that the designed program is ~53.5% more cost efficient than the matrix seriation process. This here designed program could be re-designed to process more than two cultural groups and a wider array of assemblages for the time line.

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