Representation of the dependence among indicators arising from reservoirs/tailing dams breakout

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In this study, we examine a bivariate sample from a continuous random vector and investigate its scatter plot, leading to the construction of a permutation. The permutation is used to compute the corresponding Young Tableau (see [1]). The process of constructing the permutation is thoroughly discussed in references [2] and [3]. The shape and structure of the Young Tableau are influenced by the copula that characterizes the dependence between the two components of the random vector. To quantify this dependence, we propose a method and demonstrate its effectiveness in conducting statistical hypothesis tests, enabling us to assess the suitability of specific dependence models. This paper focuses on analyzing patterns observed in Young's Tableaux within two distinct types of data: (i) rupture dice in water reservoirs and (ii) rupture dice in tailing dams. Using, for example, attributes such as the dam's volume, dam's height, peak outflow, and distance reached by the material after the rupture. It is worth noting that existing literature handles such data through linear regression models with limited success. Therefore, our aim is to propose alternative models that offer improved performance. Our approach expands upon the framework presented in references [2] and [3], thus extending its application and providing insights into the analysis of dependence structures in data of water reservoirs and tailing dam ruptures. Keywords: Young Tableau; Statistical independence; Hypothesis tests; Statistical Model. [1] Schensted, C. Longest increasing and decreasing subsequences. Canadian Journal of Mathematics 1961, 13, 179-191. https://doi.org/10.4153/CJM-1961-015-3 [2] García J.E.; González-López, V.A. Independence tests for continuous random variables based on the longest increasing subsequence. Journal of Multivariate Analysis, 2014, 127, 126-146. https://doi.org/10.1016/j.jmva.2014.02.010 [3] García, J.E.; González-López, V.A. Random Permutations, Non-Decreasing Subsequences and Statistical Independence. Symmetry

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