

A polynomial construction of perfect sequence covering arrays

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A $\text{PSCA}(v, t, \lambda)$ is a multiset of permutations of the v -element alphabet $\{0, \dots, v - 1\}$ such that every sequence of t distinct elements of the alphabet appears in the specified order in exactly λ permutations. For $v \geq t$, let $g(v, t)$ be the smallest positive integer λ such that a $\text{PSCA}(v, t, \lambda)$ exists. We present an explicit construction that proves $g(v, t) = O(v^{t(t-2)})$ for fixed $t \geq 4$. The method of construction involves taking a permutation representation of the group of projectivities of a suitable projective space of dimension $t - 2$ and deleting all but a certain number of symbols from each permutation.