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Bounds on the size of a covering array with row limit

Covering arrays with row limit, *CARLs* for short, are a generalization of covering arrays which have a new parameter weight w representing the number of components tested at the same time. When this parameter is fixed and we cover pairwise interactions, *CARLs* are equivalent to the group divisible covering designs and a special case of the graph covering problem. When w equals the number of components k , then the *CARL* is a covering array.

Here we will study some upper and lower bounds on the size of *CARLs* which have the row weight w as a function of k . We will show that the nature of the problem splits into at least two subcases: $w = o(k)$ and $w = O(k)$, for which we present different bounds.