

## Special cases of de Bruijn Objects and its applications

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A  $k$ -ary De Bruijn sequence  $B(n, k)$  of order  $n$ , is a sequence of a given alphabet  $A$  with size  $k$  for which every subsequence of length  $n$  in  $A$  appears as a sequence of consecutive characters exactly once. De Bruijn matrix is an array of symbols from an alphabet  $A$  of size  $k$  that contains every  $m$ -by- $n$  matrix exactly once. Our goal is to maximize size of the matrix. We will define rotation resistant De Bruijn matrix as a matrix where  $k = 4$  and each symbol can be rotated:  $1 \rightarrow 2, 2 \rightarrow 3, 3 \rightarrow 4, 4 \rightarrow 1$ . We will try to give an answer how big can be such a matrix. We will consider, if there exist upper bound for the size of regular de Bruijn matrix.