



Problems

NEW PROBLEMS

25. Permutation Expression Simplification Problem: Given P and Q , each length N permutation vectors (rearrangments of $1N$ or the result of $N?N$), find equivalent shorter forms for each of the following expressions:

$P[P_1Q]$
 ΔQ_1P
 $\Delta Q[P]$
 $(\Delta P)_1Q$
 $(\Delta P)[Q]$

Even more interestingly, prove your answers!
 (posed by the Problem Editor)

26. Boolean Ghost Problem: Here is a class of four problems: Given a boolean vector, after each occurrence of a [one|zero] insert a single [one|zero].

An example for the 1-0 problem:

$V \leftarrow 0\ 0\ 1\ 0\ 1\ 1$
 result = 0 0 1 0 0 1 0 1 0

There is a similar problem for insertion before each occurrence. A solution exists for each problem with less than 25 characters.

(posed by the Problem Editor)

27. Index of Occurrence Problem: Given a numeric vector, V , convert the first occurrence of every unique element to a 0, the second occurrence of every unique element to a 1, etc. Thus, if V has all unique elements, the result will be $(\rho V)\rho 0$, and if V has all duplicate elements, the result will be $1\rho V$ (computed in origin 0). Otherwise, for example

$V \leftarrow 6\ 1\ 3\ 3\ 1\ 2\ 3\ 3$
 result = 0 0 0 1 1 0 2 3

There exists an origin independent solution with less than 20 characters.

(posed by the Problem Editor)

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