

# Optimisation

1.  $x_0$  = Options
2.  $x_s$  = Random selection from options ( $x_0$ )
3.  $x_p$  = Problem to solve, which is the column sum of  $x_s$
4. Solve it. Solve knowing only  $x_p$  and  $x_0$ . Being blind to  $x_s$

```
nn=:4
]<x0=:8* (] % +/"1) (,~nn) $ ?2#~*~nn

|2.66667 2.66667 0 2.66667|
|      4      4 0      0|
|      2      2 2      2|
|      0      0 4      4|

]<x_s=:x0 {~ ?3#nn

|2 2 2 2|
|2 2 2 2|
|2 2 2 2|

]xp=:+/"2 xs
6 6 6 6
xt=(x0,0) {~ ?20#nn NB. rando solve incl all 0 option
eval=:3 : '+/ | xp - +/"2 y'
bs=:3 : '({:xt) ,~ (x0,0){~ (] i. <./) {{eval y, } : xt}}"1 x0, 0' NB. best solve
solver=: 3 : 0
xt=:bs 1
eval xt
)
solver"0 i.25
128 120 112 104 96 88 80 72 64 56 48 40 32 24 16 13.3333 8 4 4 0 0 0 0 0 0
]<xt=:xt {~ I. 0< +/"1 xt

|2 2 2 2|
|0 0 4 4|
|4 4 0 0|
```