How should we find patterns in the data?

Assume data from a triangle stored in a row of matrix M and that M is extended with a dummy column of ones. Then we are looking for the 'simplest' solutions to

$$Mx = 0.$$

Simplest translates as the sparse non-zero solutions, i.e.

$$\min \|x\|_1, \qquad Mx = 0, \quad \|x\|_2 = 1.$$

To remove the second constraint and find all relations, we can loop over the coefficients of x setting each to one. For example with $x_1 = 1$ and writing $M = (c\,|A)$.

$$\min \|x\|_1, \qquad Ax + c = 0$$