



Number of apples	Number of ways to distribute them
0	1
1	5
2	6
3	1
4	0

In how many ways can you distribute apples in the boxes considering the restrictions?

Matrices, Lefschetz properties and unimodality

$$\begin{bmatrix} 1 & 0 & 1 & 0 & 0 \\ 1 & 0 & 0 & 1 & 0 \\ 1 & 0 & 0 & 0 & 1 \\ 0 & 1 & 0 & 1 & 0 \\ 0 & 1 & 0 & 0 & 1 \\ 0 & 0 & 1 & 1 & 0 \end{bmatrix}$$

- Commutative algebra
- Algebraic topology
- Algebraic geometry
- Combinatorics