



Why

We name lists of lists, and so on.

Definition

Let s be a sequence of natural numbers: $s = (n_1, \dots, n_d)$. An *array* of *size* (or *shape*) s is a function whose domain is the set

$$I = \{(m_1, \dots, m_d) \mid 1 \leq m_1 \leq n_1, \dots, 1 \leq m_d \leq n_d\}.$$

We call the set I the set of *indices* of the array. We call the codomain of the function the set of *values* of the array. If A is the set of values, we say that the array is *in* A . We call the length of s (here denoted d) the *dimension* of the array.

Case $d = 1$

If the shape of the array has length one, then the array is no different from a sequence. In this case, the terminology for arrays coincides with that for sequences.

Case $d = 2$

If the shape of the array has length two, then the array can be thought of as a table with n_1 rows and n_2 columns.¹ We say that the array is two-dimensional.

Simplified indices

In the case that a is a one-dimensional array, or sequence, we use the common terminology a_i for the i th element of a . In the case that a is a two dimensional array, we write a_{ij} for $a_{(i,j)}$.

¹Compare with *Matrices*

