

## inf.1 Introduction

mvl:inf:int:  
sec The number of truth values of a matrix need not be finite. An obvious choice for a set of infinitely many truth values is the set of rational numbers between 0 and 1,  $V_\infty = [0, 1] \cap \mathbb{Q}$ , i.e.,

$$V_\infty = \left\{ \frac{n}{m} : n, m \in \mathbb{N} \text{ and } n \leq m \right\}.$$

When considering this infinite truth value set, it is often useful to also consider the subsets

$$V_m = \left\{ \frac{n}{m-1} : n \in \mathbb{N} \text{ and } n \leq m \right\}$$

For instance,  $V_5$  is the set with 5 evenly spaced truth values,

$$V_5 = \left\{ 0, \frac{1}{4}, \frac{1}{2}, \frac{3}{4}, 1 \right\}.$$

In logics based on these truth value sets, usually only 1 is designated, i.e.,  $V^+ = \{1\}$ . In other words, we let 1 play the role of (absolute) truth, 0 as absolute falsity, but **formulas** may take any intermediate value in  $V$ .

One can also consider the set  $V_{[0,1]} = [0, 1]$  of all *real* numbers between 0 and 1, or other infinite subsets of  $[0, 1]$ , however. Logics with this truth value set are often called *fuzzy*.

## Photo Credits

## Bibliography