# The Welkin Standard

## Syntax

### Terminals

- Undefined notions:
  - Successor $S$
  - Symbols: $0, 1$
  - Implication $\Rightarrow$
- Table of US-ASCII:

| Symbol | Encoding |
|---|---|
| { | 173 |
| } | 175 |

- A **word** is recursively defined.
  - Base case: the empty set is a word.
  - Recursion: if $w$ is a word, $w.1$ is a word.

### Atoms

- Strings are words with delimiters.
- Identifiers are strings without white space.
- Numbers are a subset of strings with an injective function $q : \mathrm{NUMBER} \to \mathbb{Q}$.

## Semantics

### Equality on Terms

- Two strings are equal if they contain the same strings, in order.
- Two numbers are equal if $q(a) = q(b)$.

A **Welkin Information Graph (WIG)** is a structure $G = (T, H, L)$ with:

- A tree $T$,
- A hypergraph $H$,
- A tree $L$ isomorphic to $T$.

The **encoding** $E(G)$ of the WIG $G$ is the unique string where

- All nodes are listed in breadth-first order
- Leaves are terms ending with "#"
- Edges are enumerated, starting from 0. They are included in nodes:
  - $s$ means source,
  - $c$ means connector,
  - $t$ means target.