**Knuth algorithm**

input: a superior $\Sigma$-hypergraph $H = (V, E, F)$
output: the smallest tree value $m(u)$ for every $u \in V$
variables: $Q, U \subseteq V$: sets of vertices $v$ for which $m(v)$ is already/ not yet determined;
$\delta \ : V \to \mathbb{R}^{\geq 0}_{\infty}$: a mapping storing computed values;
$u, v \in V$

**begin**
  **for every** $u \in V$ **do** $\delta(u) := min\{f_\sigma() \mid (\varepsilon, \sigma, u) \in E\}$;
  $Q := \emptyset$;
  $U := V$;
  **while** $U \neq \emptyset$ **do**
  **begin**
    select from $U$ a vertex $u$ such that $\delta(u) = min\{\delta(v) \mid v \in U\}$;
    $U := U \setminus \{u\}$;
    $Q := Q \cup \{u\}$;
    **for every** $v \in U$ **do**
      **for every** $(u_1 \dots u_k, \sigma, v) \in E$ with $u \in \{u_1, \dots, u_k\} \subseteq Q$ **do**
        $k\_relax(u_1, \dots, u_k, \sigma, v)$
  **end**;
  **for every** $v \in V$ **do** $m(v) := \delta(v)$
**end**

where $k\_relax(u_1, \dots, u_k, \sigma, v)$: $\delta(v) := min\{\delta(v), f_\sigma(\delta(u_1), \dots, \delta(u_k))\}$.