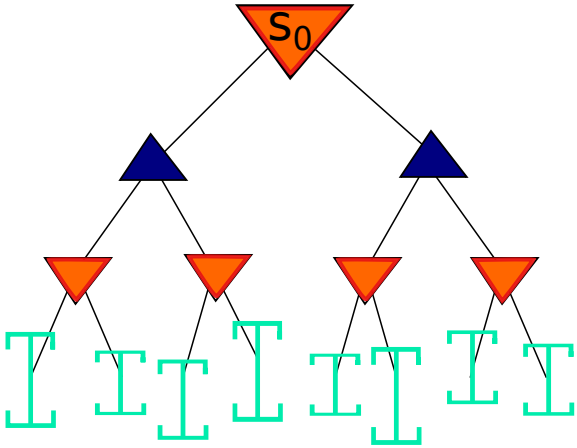
First tool: confidence intervals

Using the samples collected for the leaves, one can build, for $\ell \in \mathcal{L}$,

$[\mathrm{LCB}_\ell(t), \mathrm{UCB}_\ell(t)]$ a confidence interval on μ_ℓ

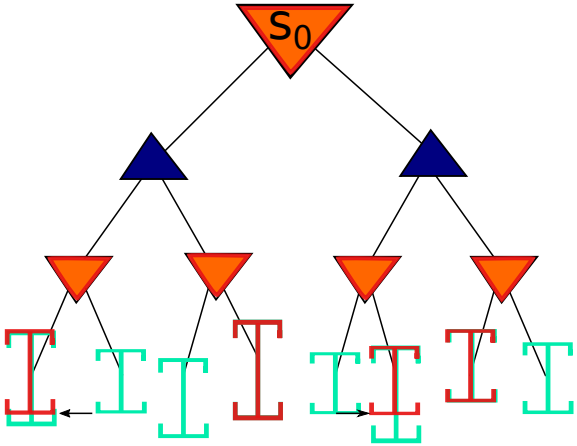


Idea: Propagate these confidence intervals up in the tree

First tool: confidence intervals

MAX node:

$$\mathrm{UCB}_s(t) = \max_{c \in \mathcal{C}(s)} \mathrm{UCB}_c(t) \qquad \mathrm{LCB}_s(t) = \max_{c \in \mathcal{C}(s)} \mathrm{LCB}_c(t)$$

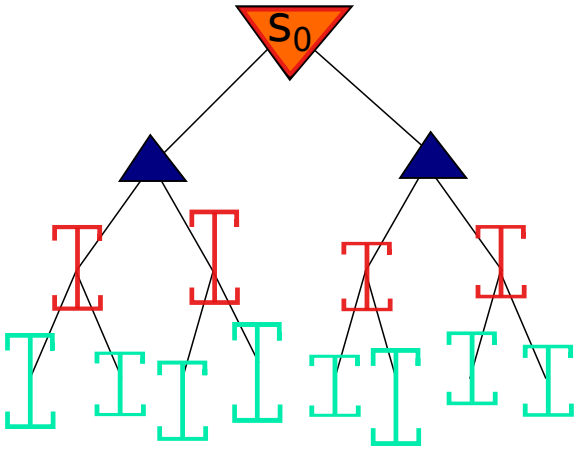


Idea: Propagate these confidence intervals up in the tree

First tool: confidence intervals

MAX node:

$$\mathrm{UCB}_s(t) = \max_{c \in \mathcal{C}(s)} \mathrm{UCB}_c(t) \qquad \mathrm{LCB}_s(t) = \max_{c \in \mathcal{C}(s)} \mathrm{LCB}_c(t)$$

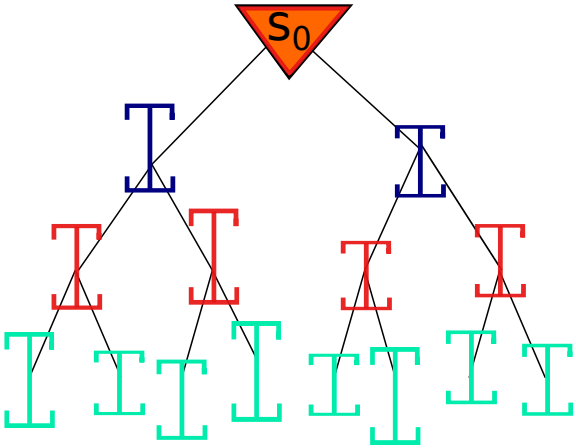


Idea: Propagate these confidence intervals up in the tree

First tool: confidence intervals

MIN node:

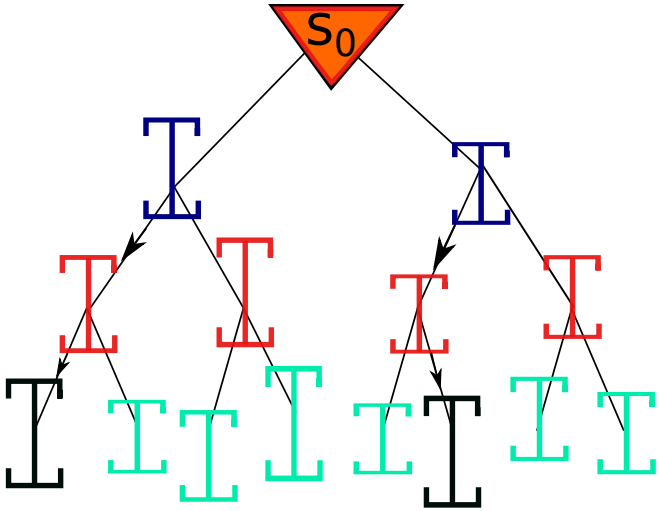
$$\mathrm{UCB}_s(t) = \min_{c \in \mathcal{C}(s)} \mathrm{UCB}_c(t) \qquad \mathrm{LCB}_s(t) = \min_{c \in \mathcal{C}(s)} \mathrm{LCB}_c(t)$$



Idea: Propagate these confidence intervals up in the tree

Second tool: representative leaves

$\ell_s(t)$: representative leaf of internal node $s \in \mathcal{T}$.



Idea: alternate optimistic/pessimistic moves starting from s