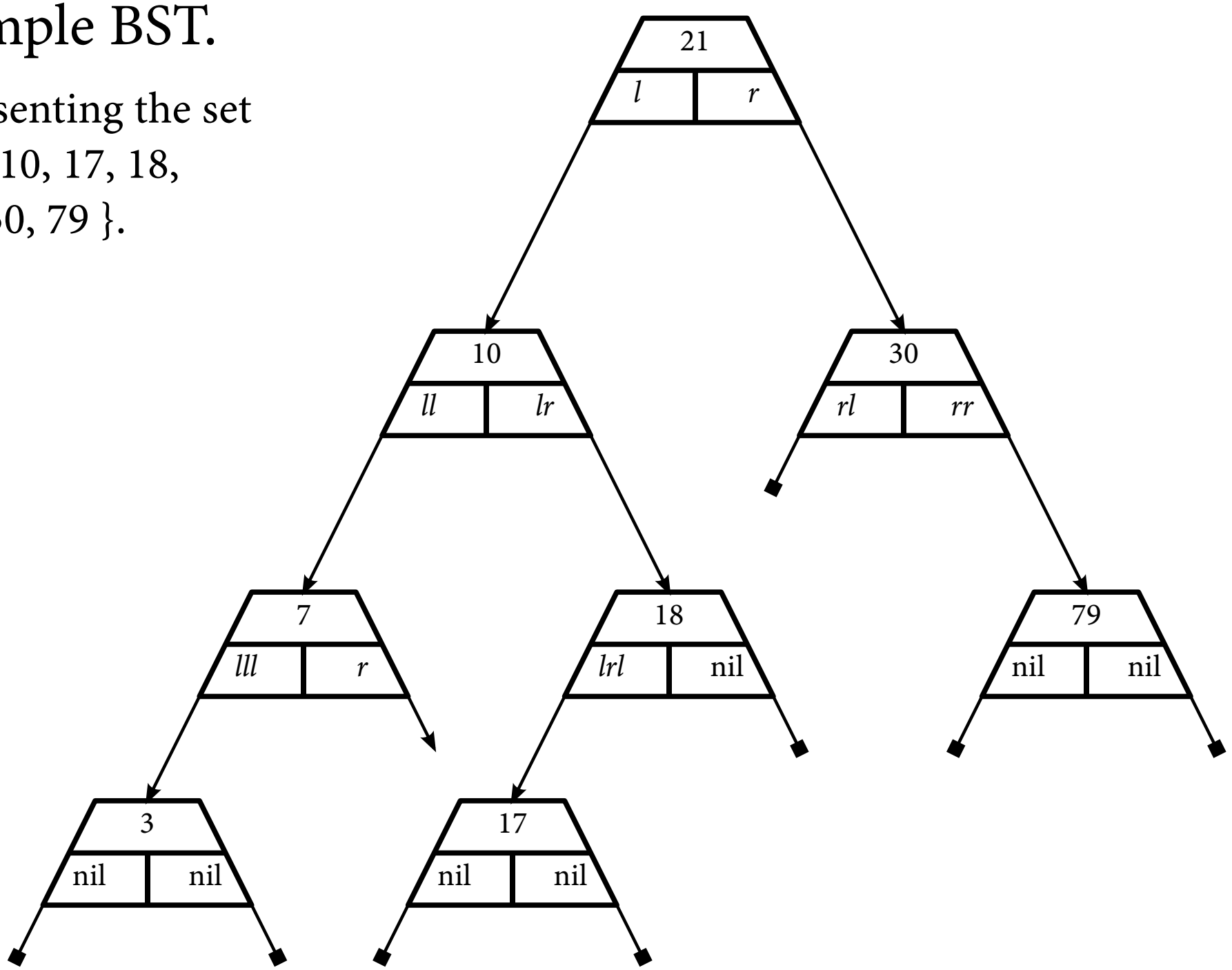
Example BST.

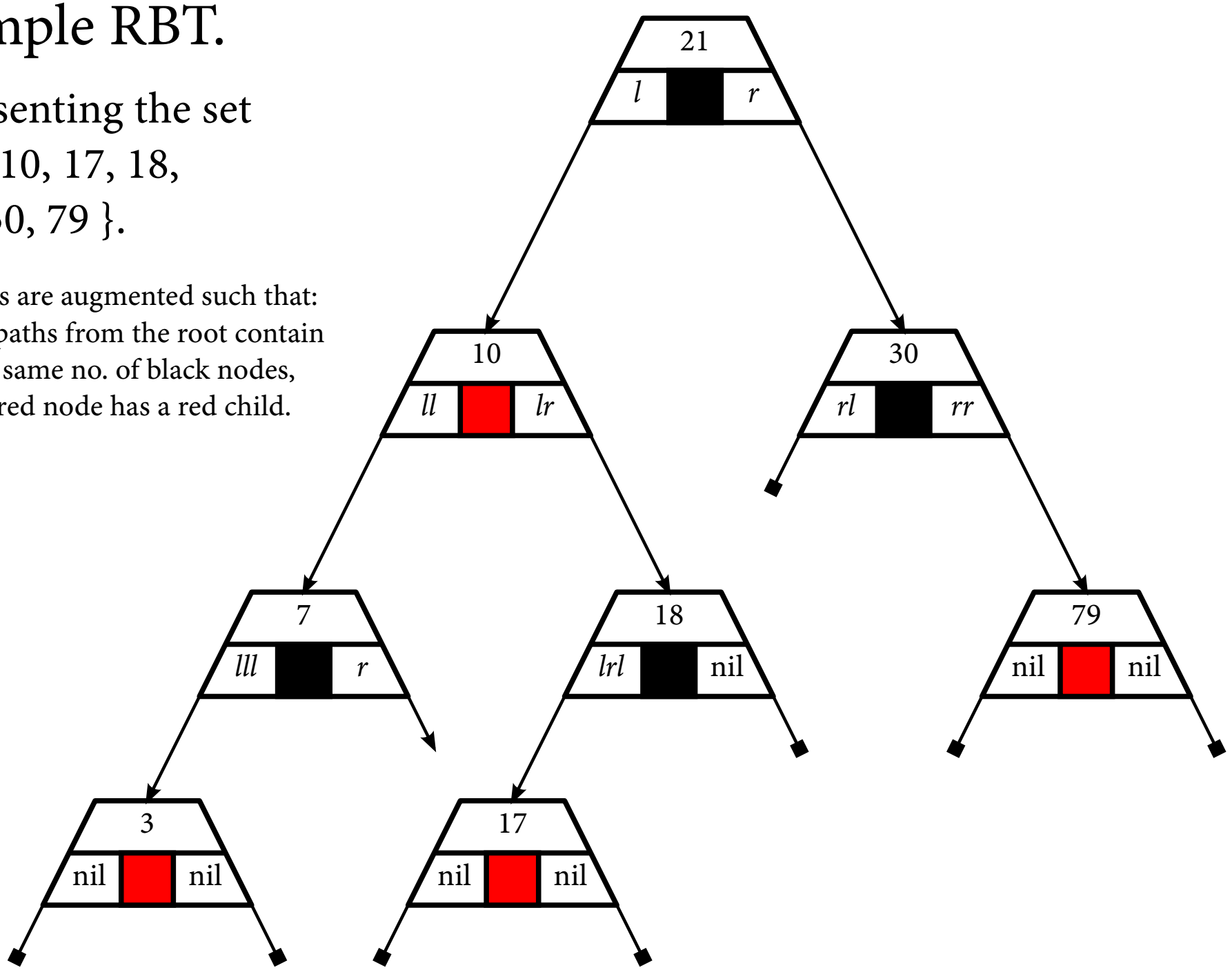
Representing the set
{ 3, 7, 10, 17, 18,
21, 30, 79 }.



Example RBT.

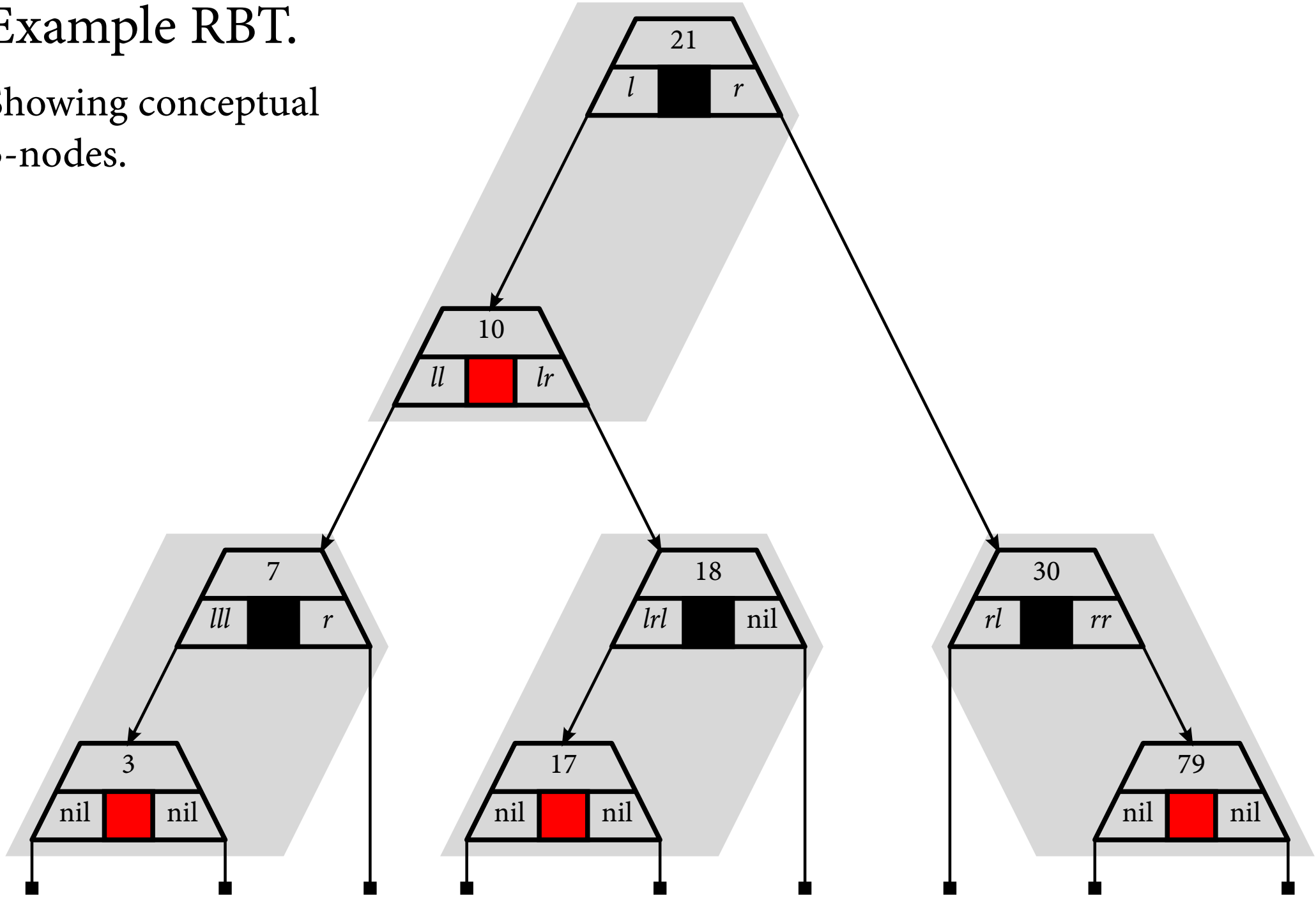
Representing the set
{ 3, 7, 10, 17, 18,
21, 30, 79 }.

The nodes are augmented such that:
(1) all paths from the root contain the same no. of black nodes,
(2) no red node has a red child.



Example RBT.

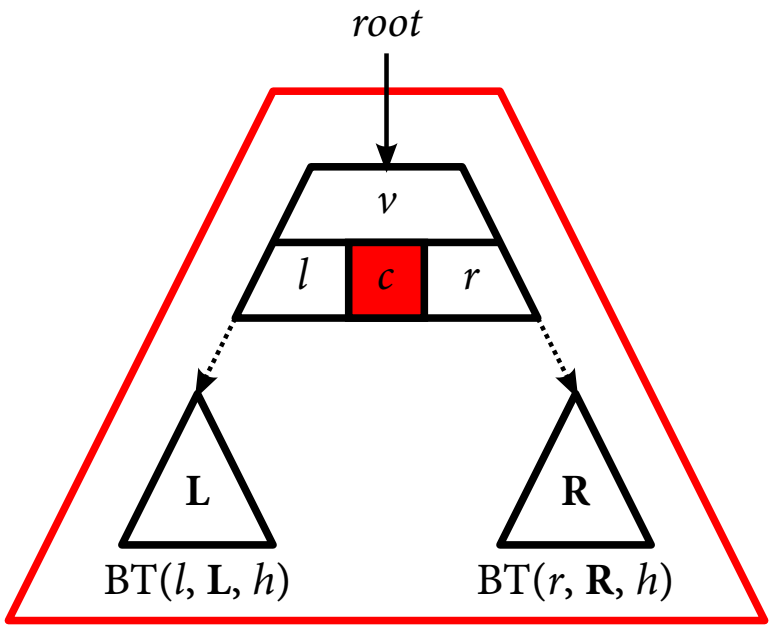
Showing conceptual 3-nodes.



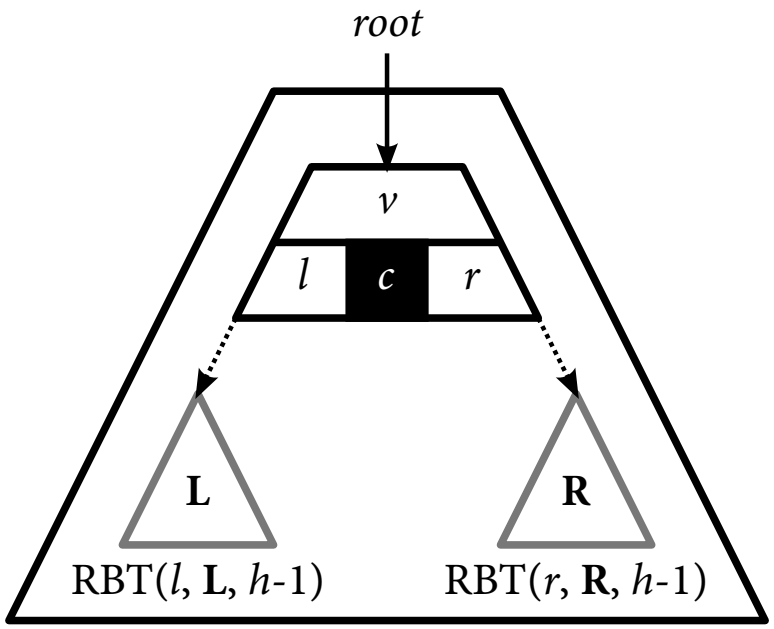
RBT predicates.

RBT(*root*, **S**, *h*)

BT(*root*, **S**, *h*)



RT(*root*, **S**, *h*),
where Compose(**L**, *v*, **R**, **S**),
and $h \geq 0$.



NBT(*root*, **S**, *h*),
where Compose(**L**, *v*, **R**, **S**),
and $h > 0$.

EBT(*root*, **S**, *h*),
where **S** = ∅
and h = 0.

Compose(**L**, v, **R**, **S**)

$\mathbf{L} \cup \{v\} \cup \mathbf{R} = \mathbf{S} \wedge$

$\forall l \in \mathbf{L}.\ l < v \wedge$

$\forall r \in \mathbf{R}.\ v < r.$