

Exercise 2.64

(1 3 5 7 9 11)

(partial-tree (1 3 5 7 9 11) 6)

left-size: (quot (- 6 1) 2) \Rightarrow 2

left-result: (partial-tree (1 3 5 7 9 11) 2)

- elts. - use $n - 1 / 2$ elems for left subtree
- use $n - \text{left size} + 1$ for entry + right subtree
- take (first non-left-elts) as entry⁴ (midpoint of elts)
- take (rest non-left-elts) for right-subtree
- Order of growth is $O(\lg n)$.

↳ left-size: (quot (- 2 1) 2) \Rightarrow 0

left-result: (partial-tree elts 0) \Rightarrow (() (1 3 5 7 9 11))

left-free: (first left-result) \Rightarrow '()' \emptyset

non-left-elts: (rest left-result) \Rightarrow (1 3 5 7 9 11)

right-size: (- 2 (+ 0 1)) \Rightarrow 1

this-entry: (first non-left-elts) \Rightarrow 1

right-result: (partial-tree (3 5 7 9 11) 1)

↳ left-size: (quot (- 1 1) 2) \Rightarrow 0

left-result: (partial-tree (3 5 7 9 11) 0) \Rightarrow (() (3 5 7 9 11))

left-free: (first left-result) \Rightarrow ()

non-left-elts: (rest left-result) \Rightarrow (3 5 7 9 11)

right-size: (- 1 (+ 0 1)) \Rightarrow 0

this-entry: (first non-left-elts) \Rightarrow 3

right-result: (partial-tree (5 7 9 11) 0) \Rightarrow (() (5 7 9 11))

right-tree: (first right-result) \Rightarrow ()

remaining-elts: (rest right-result) \Rightarrow (5 7 9 11)

(() () (5 7 9 11)) $\xrightarrow[3]{\emptyset \emptyset}$

right-tree: (first right-result) \Rightarrow (3 () ())

remaining-elts: (rest right-result) \Rightarrow (5 7 9 11)

(() () (3 () ()) (5 7 9 11))

left-tree: (first left-result) \Rightarrow (1 () (3 () ()))



non-left-elts: (rest left-result) \Rightarrow (5 7 9 11)

right-size: (- 6 (+ 2 1)) \Rightarrow 3

this-entry: (first non-left-elts) \Rightarrow 5

right-result: (partial-tree (7 9 11) 3)

↳ left-size: (quot (- 3 1) 2) \Rightarrow 1

left-result: (partial-tree (7 9 11) 1)

↳ left-size: (quot (- 1 1) 2) \Rightarrow 0

left-result: (() (7 9 11))

left-tree: (first left-result) \Rightarrow ()

non-left-elts: (7 9 11)

right-size: (- 1 (+ 0 1)) \Rightarrow 0

this-entry: ?

right-result: (partial-tree (9 11) 0) \Rightarrow (() (9 11))

right-tree: ()

remaining-elts: (rest right-result) \Rightarrow (9 11)

(() () (9 11))

left-tree: (first left-result) \Rightarrow (7 () ())

non-left-elts: (9 11)

right-size: (- 3 (+ 1 1)) \Rightarrow 1

this-entry: (first non-left-elts) \Rightarrow 9

right-result: (partial-tree (11) 1)

$\hookrightarrow \text{left-size} : (\text{quot } (-1) 2) \Rightarrow 0$
 $\text{rest-result} : (\text{partial-tree } (11) 0) \Rightarrow ((\text{ }))$
 $\text{left-tree} : ()$
 $\text{non-left-elts} : (11)$
 $\text{right-size} : (-1 \text{ } (+ 0 1)) \Rightarrow 0$
 $\text{this-entry} : (\text{first } (11)) \Rightarrow 11$
 $\text{right-result} : (\text{partial-tree } (7) 0) \Rightarrow ((11))$
 $\text{remaining-elts} : ()$
 $((11)(7))$

remaining-elts: ()

$((9(7)(1))(11(1)))$



right-tree: ($\text{first right-result}$) $\Rightarrow (9(7)(1)(11(1)))$

remaining-elts: ()

$(5(1(1(3(1))))(9(7(1(1))(11(1)))))$

