By looking at the figure it is clear that the value at node A is the sum of the values of its children. The index of node A is at $2^{h+1}-1$ which is the same as its right child. The left child of A has index $2^h - 1$. Let S be the array then

$$S[2^{h+1}-1] = S[2^h - 1] + S[2^{h+1}-1]$$

For node B it is the same except we shift the indices by 2^{h+1} to the right. Therefore for nodes at level $h+1$ we have

$$S[k+2^{h+1}-1] = S[k+2^h - 1] + S[k+2^{h+1}-1]$$

where k starts with 0 and is incremented by 2^{h+1}. The above is performed for

forall $k = 0, k < n$ *multiples of* 2^{h+1} **do**
  $S[k+2^{h+1}-1] = S[k+2^h - 1] + S[k+2^{h+1}-1]$
end

all values of h.

for $h = 0$ **to** $\log n - 1$ **do**
  for $k = 0, k < n$ *multiples of* 2^{h+1} **do**
    $S[k+2^{h+1}-1] = S[k+2^h - 1] + S[k+2^{h+1}-1]$
  end
end

Now, multiples of 2^{h+1} can be write as $\alpha 2^{h+1}$ with $\alpha = 0, \ldots, d-1$ with $d = \frac{n}{2^{h+1}}$.

for $d = \frac{n}{2}$ **to** 1 **do**
  for $\alpha = 0$ **to** $d-1$ **do**
    $S[(2\alpha+2)s - 1] += S[(2\alpha+1)s - 1]$
    $\alpha = \alpha + 1$
  end
  $s = 2 * s$
  $d = d/2$
end