05-I

二叉树

重构

No matter where they take us,

We'll find our own way back.

邓俊辉

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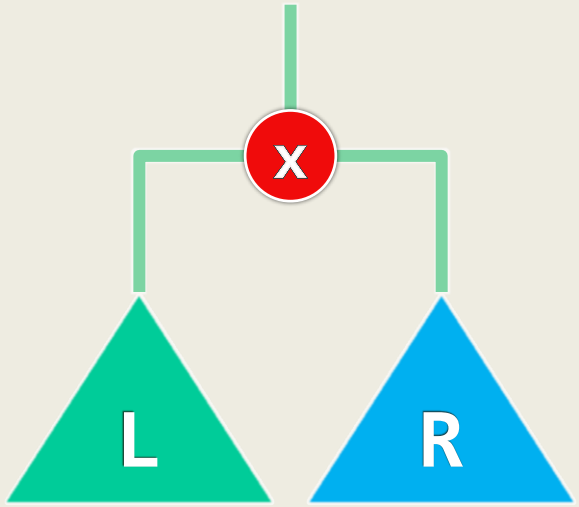
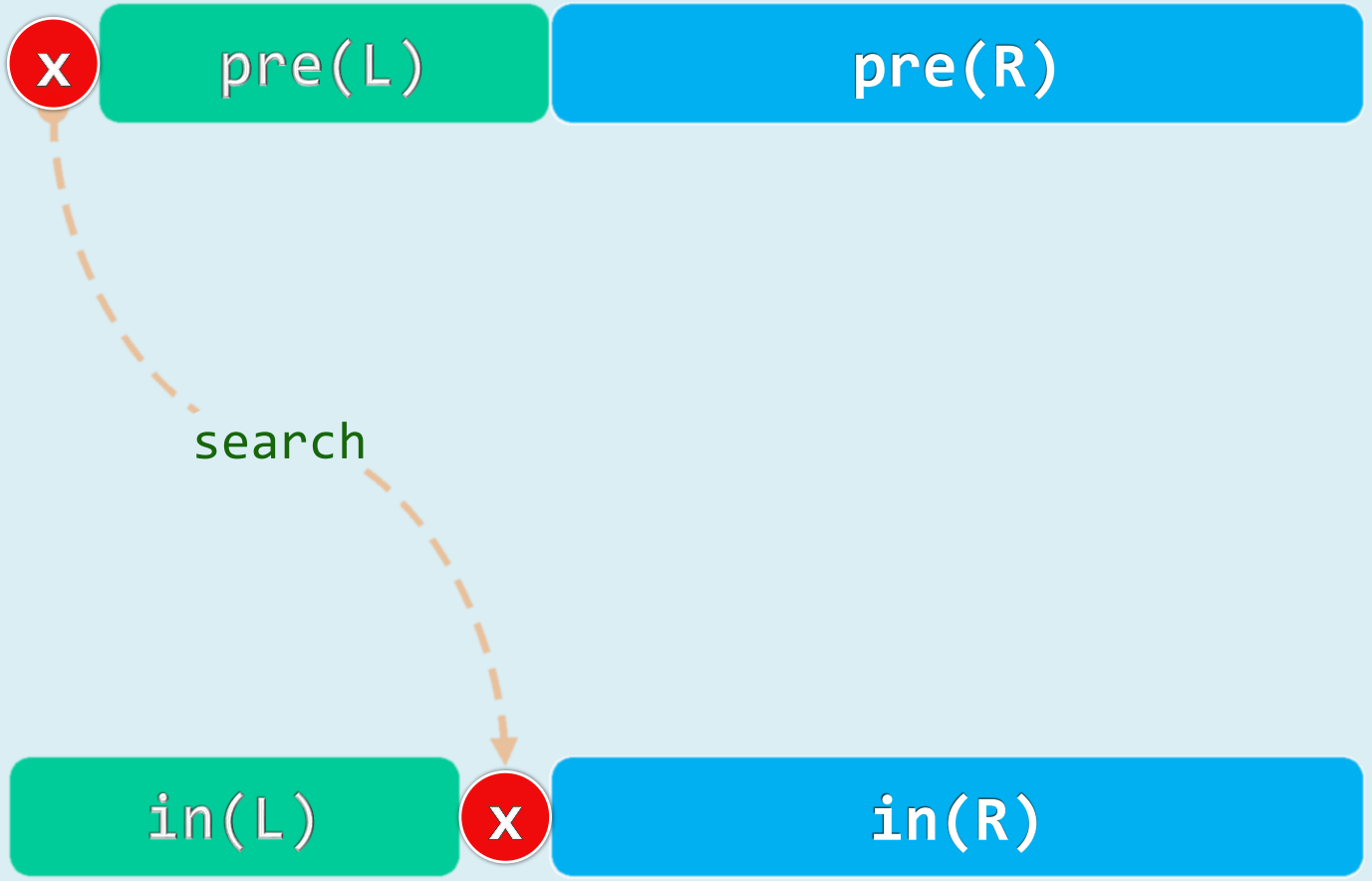
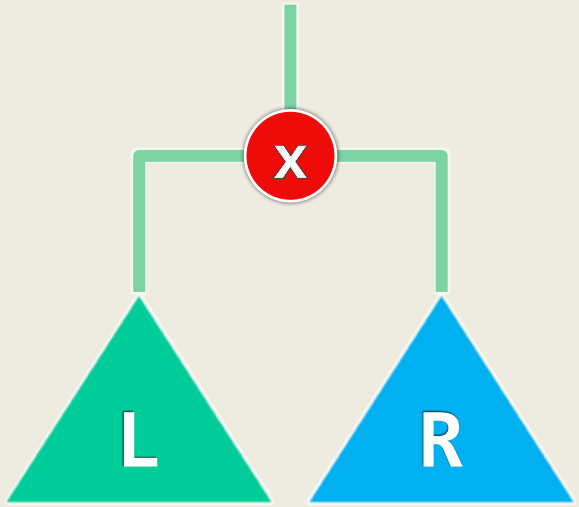
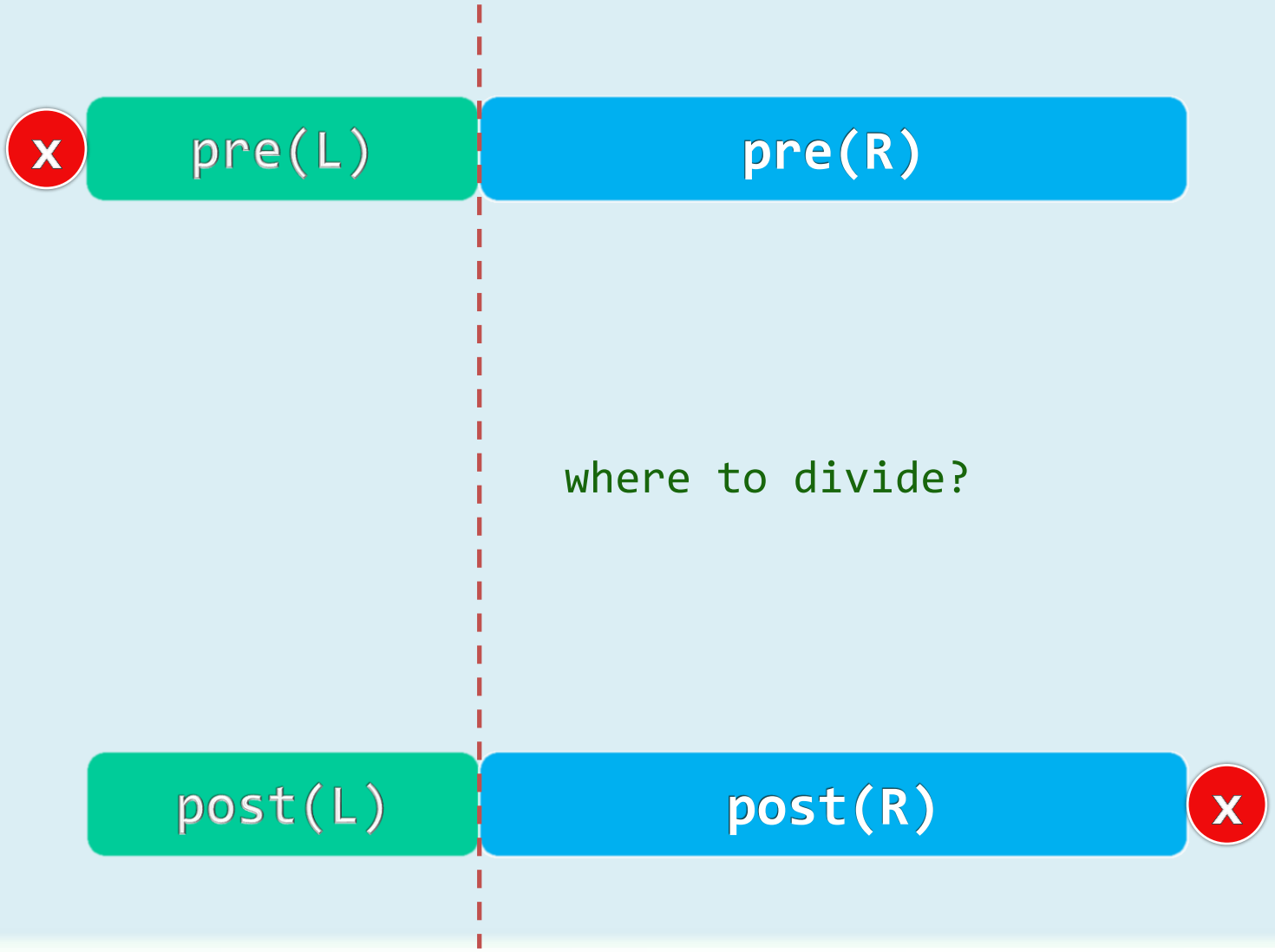
[先序 | 后序] + 中序



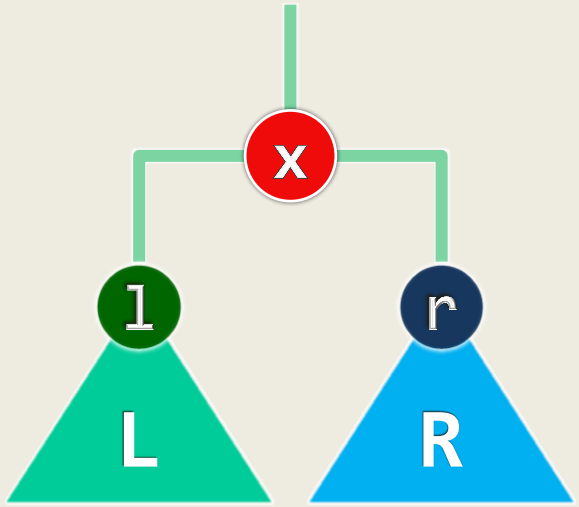


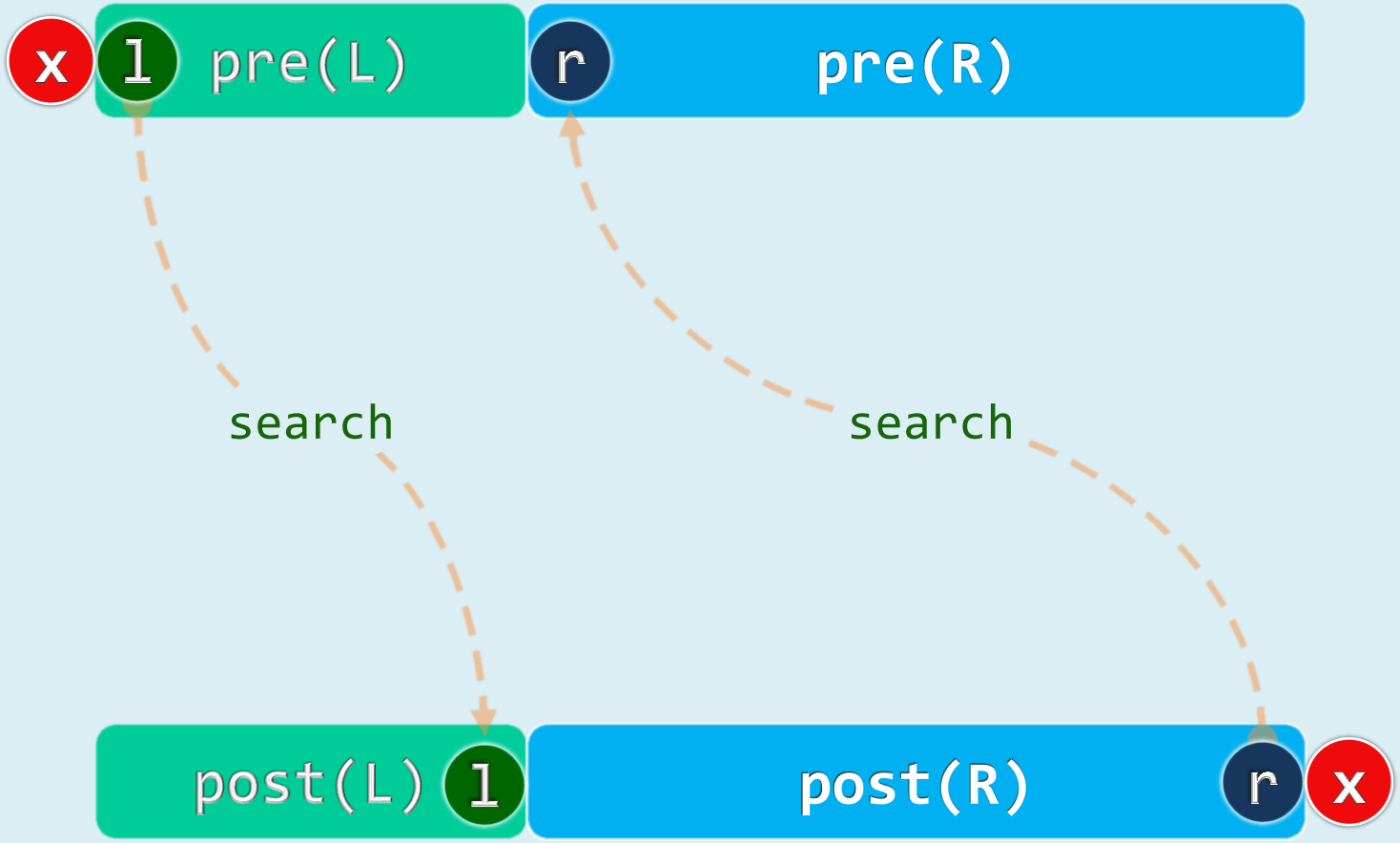
[先序 + 后序] ?



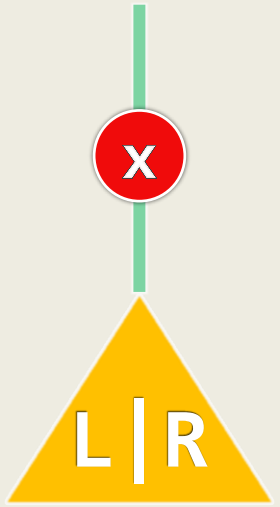


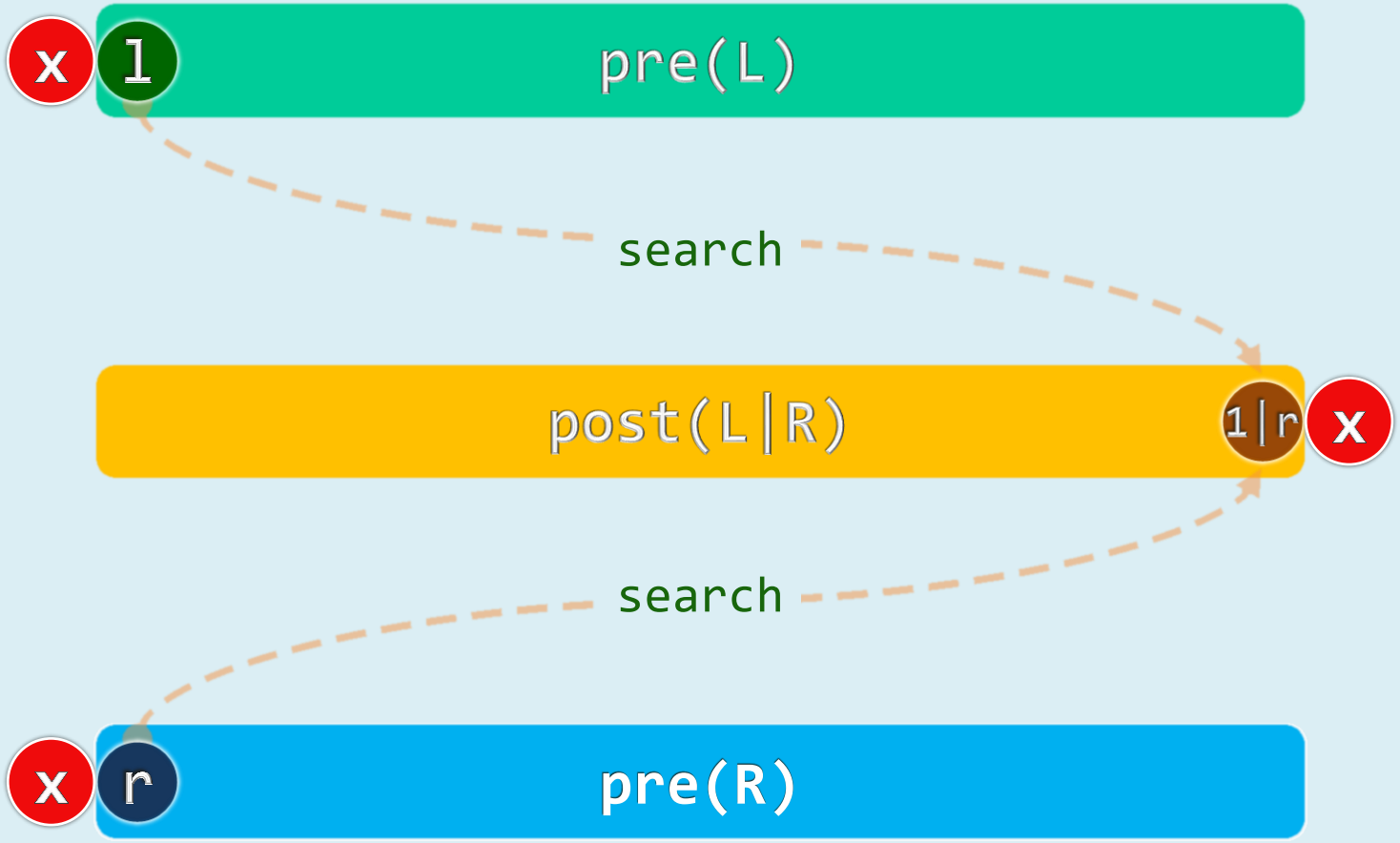
[先序 + 后序] ！



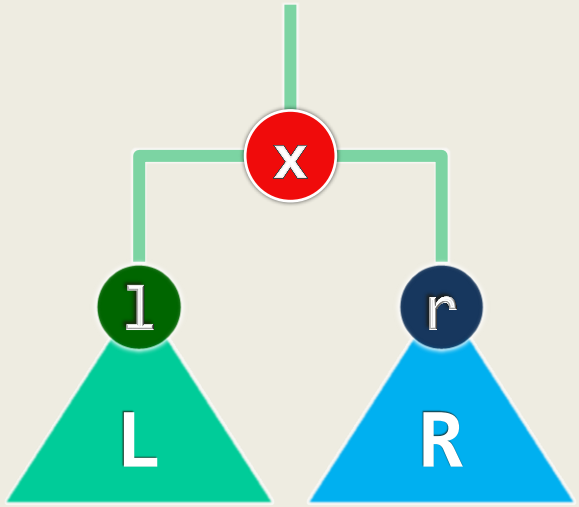


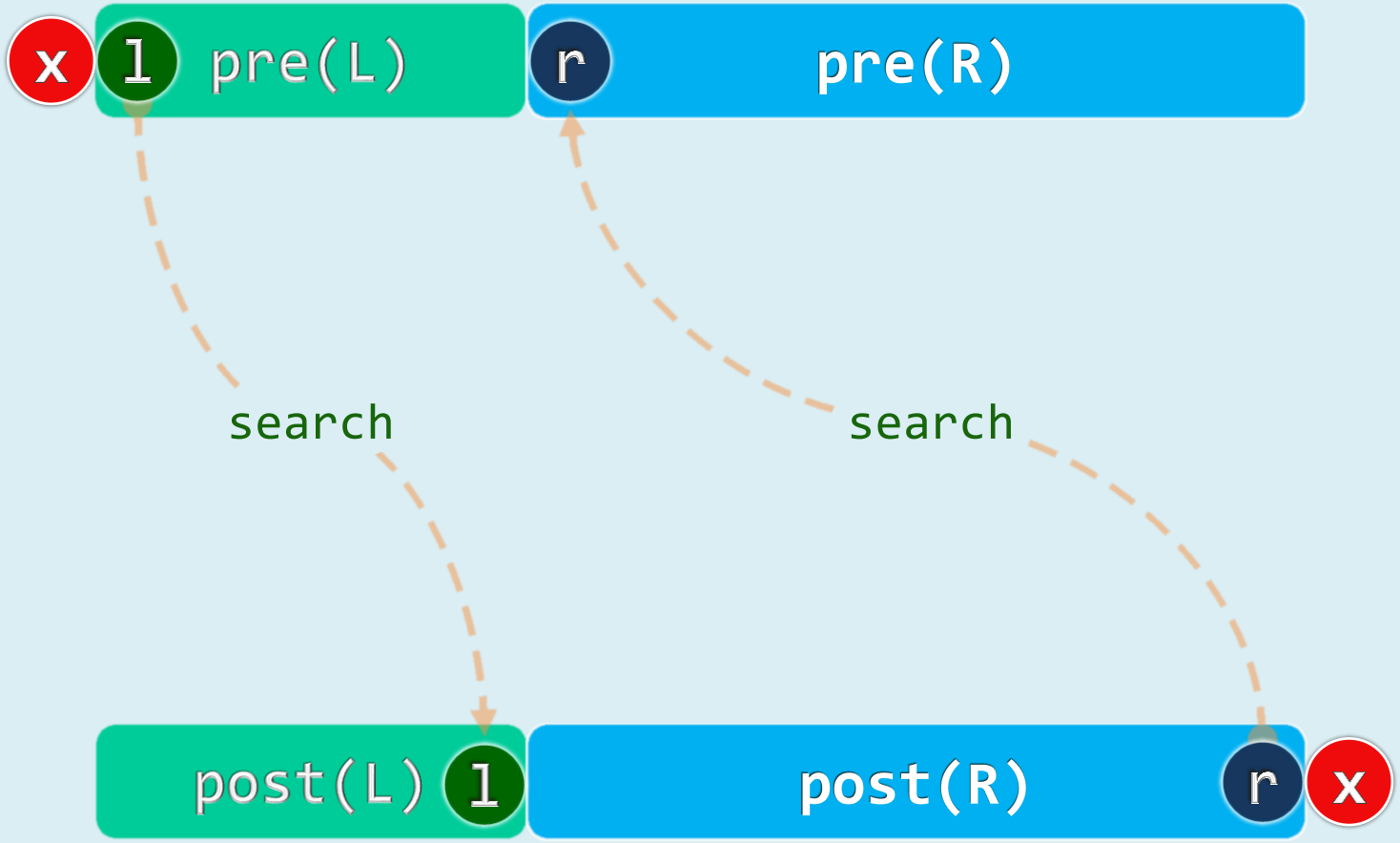
[先序 + 后序] ？？





[先序 + 后序] x 真！





增强序列

- 假想地认为，每个NULL也是“真实”节点，并在遍历时一并输出

  每次递归返回，同时输出一个事先约定的元字符“^”

- 若将遍历序列表示为一个Iterator，则可将其定义为

  ```
  Vector< BinNode<T> * >
  ```

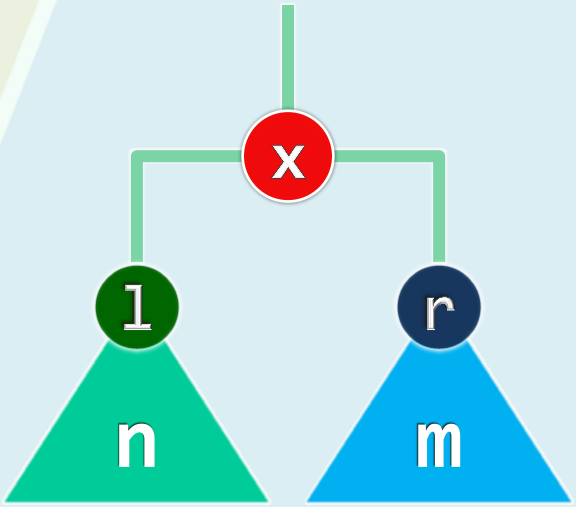
  于是在增强的遍历序列中，这类“节点”可统一记作NULL

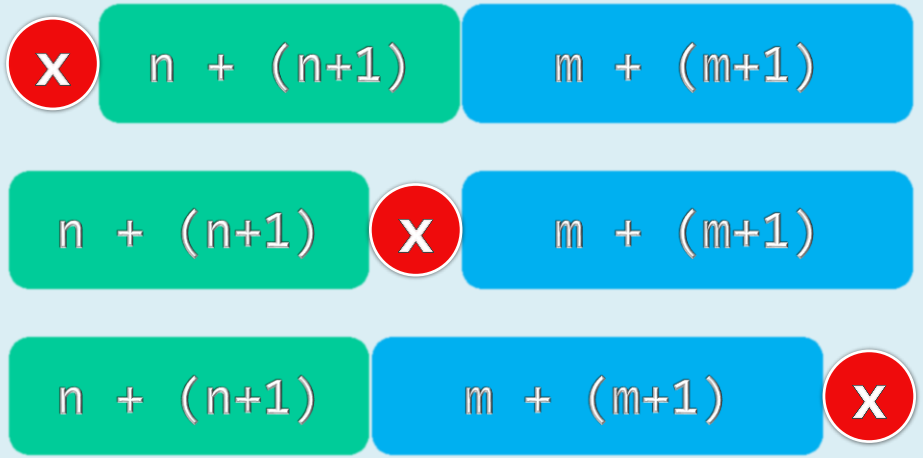
- 可归纳证明：在增强的先序、中序、后序遍历序列中

  1）任一子树依然对应于一个子序列，而且

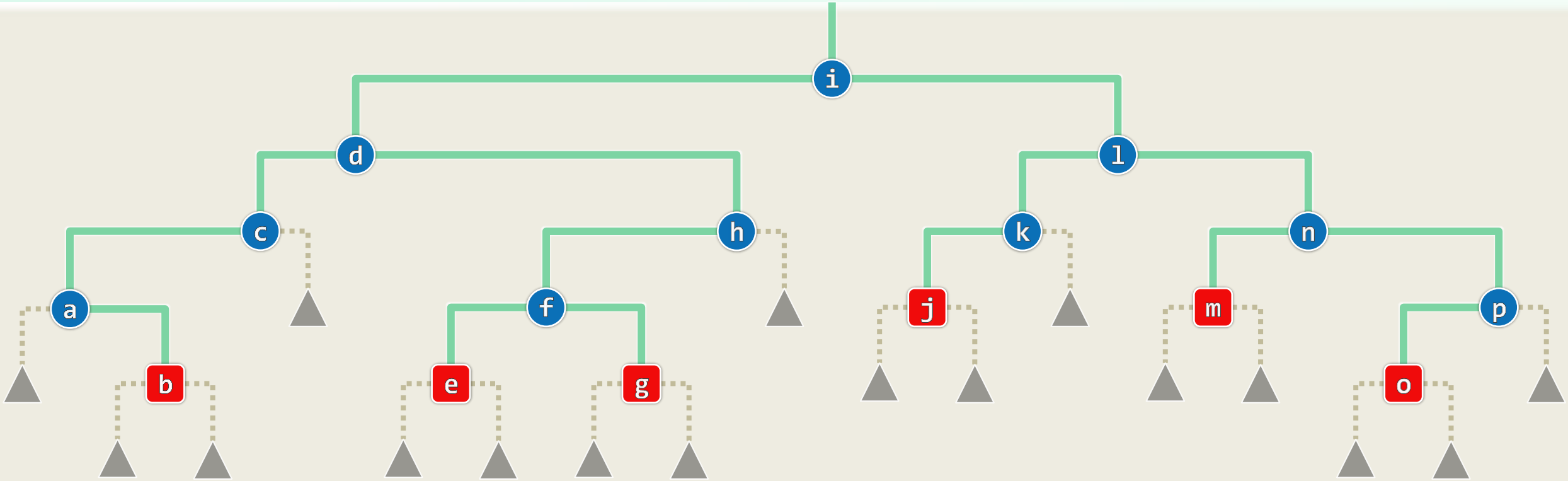
  2）其中的NULL节点恰比非NULL节点多一个

- 如此，通过对增强序列分而治之，即可重构原树





增强序列：实例



preorder : i d c a ^ b ^ ^ ^ h f e ^ ^ g ^ ^ ^ l k j ^ ^ ^ n m ^ ^ p o ^ ^ ^

inorder : ^ a ^ b ^ c ^ d ^ e ^ f ^ g ^ h ^ i ^ j ^ k ^ l ^ m ^ n ^ o ^ p ^

postorder : ^ ^ ^ b a ^ c ^ ^ e ^ ^ g f ^ h d ^ ^ j ^ k ^ ^ m ^ ^ o ^ p n l i