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311 notes

Iterative vs Recursive

- given an array of unsigned values (N), Find the sum of all N elements in the array

- Function needs 2 parameters
  1. an array
  2. number of elements

1. iteratively O(n)

```
unsigned sum (unsigned A[], unsigned n) {
        unsigned sumA=0;
        for(int i=0, I < n, i++)
                sum += A[i];
        return sumA;
        }
```

2. Recursively O(n)

```
unsigned sum (unsigned A[]), unsigned n) {

        if(n==0) // base case
                return 0;
        else
                return A[n-1] +
                        sum (A, n-1);
}
```

Deletion from a BST

- To delete a node, replace the node with its in-order predecessor
  - right most node, on its left tree

Big O

push, in an ordered linked list implemented as a priority queue takes O(n)

Binary Heap

Binary heap = $O(\log_2 n)$, height = logn

- min heap – smaller value = higher priority
  - Heap structure property:
    - Must be an almost complete tree
  - Heap order property
    - if you randomly pick any node, that node has the smallest value in the entire tree
- max heap – higher value = higher priority

Given index i:
index of a left child: 2i+1
index of right child: 2i+2
index of parent: (i-1) / 2