Day 38 Highlights

1. Reminders
   1. Project six is due today at 5pm
2. Recursion
   1. Integers, n 🡪 n-1, n 🡪 n/10, n🡪n/2, n🡪n/8
   2. Strings, s 🡪 s+1
   3. Arrays, (a, n) 🡪 (a+1, n-1) or (a, n-1) or

(a, n/2) and (a+n/2, n-n/2)

* 1. Linked lists, head 🡪 head->next

1. Four search algorithms (search for an item in a sorted array)
   1. Iterative linear search
   2. Recursive linear search
   3. Recursive binary search
   4. Iterative binary search

1. Comparison among the above four search algorithms
   1. Binary search requires that the array elements are sorted.
   2. Binary search performs better than linear search
   3. Recursive search is limited by the stack size
   4. Iterative search performs a little better than recursive search due to function call overhead
   5. Recursive search is easier to understand and its function is easier to write.
2. Recursive binary search
   1. Definition of binary search
      1. Base case
      2. Recursive case

**int BSearch(int num, int \*array, int first, int last) {**

**// base case #1**

**if (first > last) return -1;**

**// base case #2**

**int mid = (first + last) / 2;**

**if (array[mid] == num)**

**return mid;**

**// recursive cases**

**if (array[mid] < num)**

**return BSearch(num, array, mid+1, last);**

**else**

**return BSearch(num, array, first, mid-1);**

**}**