CTA - Practice Homework 2 (Recursion)

Work these out on paper, and then program an implementation. Doubtless the answers exist on-line so if you don't want to learn you can Google them but then you will never learn how to think like a programmer and that will be very sad. All of these questions should be solved using **recursion**. If you are struggling it may be prudent to solve them iteratively to help you get a handle on the question, then you could return to recursion.

1. Write an algorithm that returns the reverse of a given string.
2. Write an algorithm that reverses an array in-place (i.e changes what is stored at each index), assume the input array contains numbers.
3. Write an algorithm that checks whether an element occurs in an array, assume unsorted.
4. Write an algorithm that computes the sum of an array of numbers.
5. Write an algorithm to produce calculate the Nth number in the Fibonacci sequence. Assume the sequence begins 0,1,1,2....
6. Write a recursive function that checks whether a string is a palindrome (a palindrome is a string that's the same when reads forwards and backwards.)
7. Given a number and a power, compute the result of the number raised to that power. For example $2^3 = 8$.
8. Given a string and a substring, compute how many times that substring appears in the string. For example "he" appears twice in the string "her and herself".