# Objective

Practice recursive programming

problem

In this assignment you will be writing recursive methods with the given signatures. You should not change the method paraments or the method return type. Non-recursive solutions will get zero points.

A shell for your program is provided. Do not change the main method. Your program must work with the given main method.

# Methods

1. **public static boolean palindrome(int[] a, int index):** This method accepts an array of integers and an index. Returns true if the array is palindrome, returns false otherwise. Refer to the palindrome method for String objects provided during the lecture. In order to sole the problem, think about the base case meaning under what condition the recursive call will stop. Array {1,2,3,4,3,2,1} is a palindrome array, and the array{1,2,3,4,5,3,2,1} is not a palindrome array.
2. **public static int sum(int n):** this recursive method that accepts an integer as its parameter and returns the sum of the digits in the give integer. For example sum(3456) should return 18. You need to use % and /. What is the base case?
3. **Public static String longest(String[] s, int index, String longest):** this recursive method finds the longest string in an array of String. Refer to the method getMin that finds the minimum value in an array of integers.
4. **Public static Boolean equals (String s1, String s2, int index):** this recursive method returns true if the two string are exactly the same, and returns false otherwise. Refer to the equals method provided for the array of integers during the lecture.
5. **Public static int listSum(LinkedList<Integer> list, int index**): this recursive method returns the sum of all the numbers in the linklist. Use the method get from the java LinkedList class.

Main method

Your must run your program with the following main method.

**Sample output**

testing the palindrome method

[5, 6, 4, 5, 8, 5, 4, 6, 5, 12] is palindrome? false

[1, 2, 3, 4, 3, 2, 1] is palindrome? true

testing sum of the digits

The sum of the digits in 12345 is 15

testing longest string in an array of string

The longest string is the array [Hello, Bye, Said, song, Building] is Building

testing the equals method on the strings

are the strings hello and helloo equal? false

are the strings tomorrow and tomorrow equal? true

testing the sum of the integers in a link list

The sum of the numbers in the link list [5, 7, 8, 12] is 32