

Recursion Practice

Let's practice writing a variety of short recursive functions. Please download the file Recursion.java. You can also adapt this exercise to Python if you wish.

You may find it helpful to plan your solutions on paper before typing it in.

When you are done, you should experiment with different input values. Here is an example I/O session: the input I entered is underlined.

List of numbers: 1 2 3 4 5 6 7 8 9 10

The sum 1..10 equals 55

Star pattern:

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Enter a string: hello

Reversal is: olleh

palindrome() returns false

Enter a list of numbers: 5 16 4

sum is 25

Largest element of array is 9

Array sum is 29

Enter a positive integer: 27

Binary equivalent is 11011

Converting back to integer: 27

Here are some hints...

For finding the largest value of an array, this value might be the first number in the array, or the largest number if you were to ignore the first value. For example, if an array *a* has 10 elements, then the largest element is either *a*[0] or the largest among *a*[1] through *a*[9]. But, the next question is, what is the largest element among *a*[1] through *a*[9]? Well, it's either *a*[1] or the largest among *a*[2] through *a*[9]. See a pattern here?

For converting between binary strings and integers: Consider the binary string "101". This represents the number 5. What if we were to append a "0" onto the right end of this string? We would obtain "1010" and this equals 10. But what if we were to append a "1" instead? The result would be "1011" and this equals 11. What is the mathematical relation between 10 (or 11) and 5?