Recursion at the basic level is a way of solving a problem with a program in which a method calls on itself to solve the problem. The method calling itself is the recursive method.

One of the common ways to use recursion in programming is when we need to sort an array, most commonly an array with numbers. There are a variety of ways with recursion to most efficiently solve this issue and one of the more basic ways is to use something known as bubble sorting. In effect, this method iterates over an array and it compares the current position with the next position in the array and if the next number is larger than the current number, the two numbers are then switched. If the current number is less than the next number, the numbers stay in place. This takes place until the iteration finishes checking the array with its first pass. This method then continues to call upon itself until the array is sorted in order. It gets its name bubble sort due to the largest numbers “bubbling” up to the end of the array with each iteration.

Binary search is a programming concept that allows a programmer to search through an array of elements in way that is not in linear time but O(log n) time complexity. Meaning it is almost always faster than a linear search through an array. The caveat is that the array needs to be sorted first in order for this to be the case.

The way binary search works is by essentially splitting an array into halves and checking if the number wanted is either in the exact middle which in that case it will return the number and be done. If the number in the middle umber is lower than the number we are searching for, then we know we can “cut off” the left half of the array as the number cannot lie within it. This method will then recur and halving the array until the number is found.