Multi-part algorithms

An algorithm may deal with multiple sets of data or the same set of data multiple times.

When this occurs we should add or multiply the runtimes of each set of data.

So when do we add the runtimes together and when do we multiply them?

Adding Runtimes

The big idea:

If your algorithm is in the form “do this, then, when you’re all done, do that” then you add the runtimes.

— *Cracking the Coding Interview*

```
logTwoArrays(["A", "B", "C", "D"], [1, 2, 3, 4])

function logTwoArrays(arrA, arrB){
  for(let i=0; i<arrA.length; i++){
    console.log(arrA[i])
  }
  for(let j=0; j<arrB.length; j++){
    console.log(arrB[j])
  }
}
```

In this example, the runtime is influenced by the size of arrA and the size of arrB, so the Big O notation is O(arrA + arrB). This may be abstracted to O(N + M).