Operation	Static Array	Dynamic Array
Access	O(1)	O(1)
Search	O(n)	O(n)
Insertion	N/A	O(n)
Appending	N/A	O(1)
Deletion	N/A	O(n)

Static Array

A fixed-length container containing n elements that are indexable from the range $[0,\ n-1]$

- Indexable
- It is contagious in memory, each element is right next to each other
- Due to their versatility they are used almost everywhere

Dynamic Array

An array that can grow and shrink in size, that contains n elements that are indexable from the range $[0,\ n-1]$

Implementation

1. Create a static array with an initial capacity
2. Add elements to the underlying static array, keeping track of the number of elements
3. If adding another element will exceed the capacity, create a new static array with twice the capacity and copy the original elements into it

Accessing in Memory

How accessing a value such as `a[0]` actually works is that in the memory location of that array `a` the computer knows the amount of bits any value in this array takes up whether it is 4 bytes, 8 bytes, etc. so it multiplies that value by the index and gets the memory location to return the value at `a[0]`