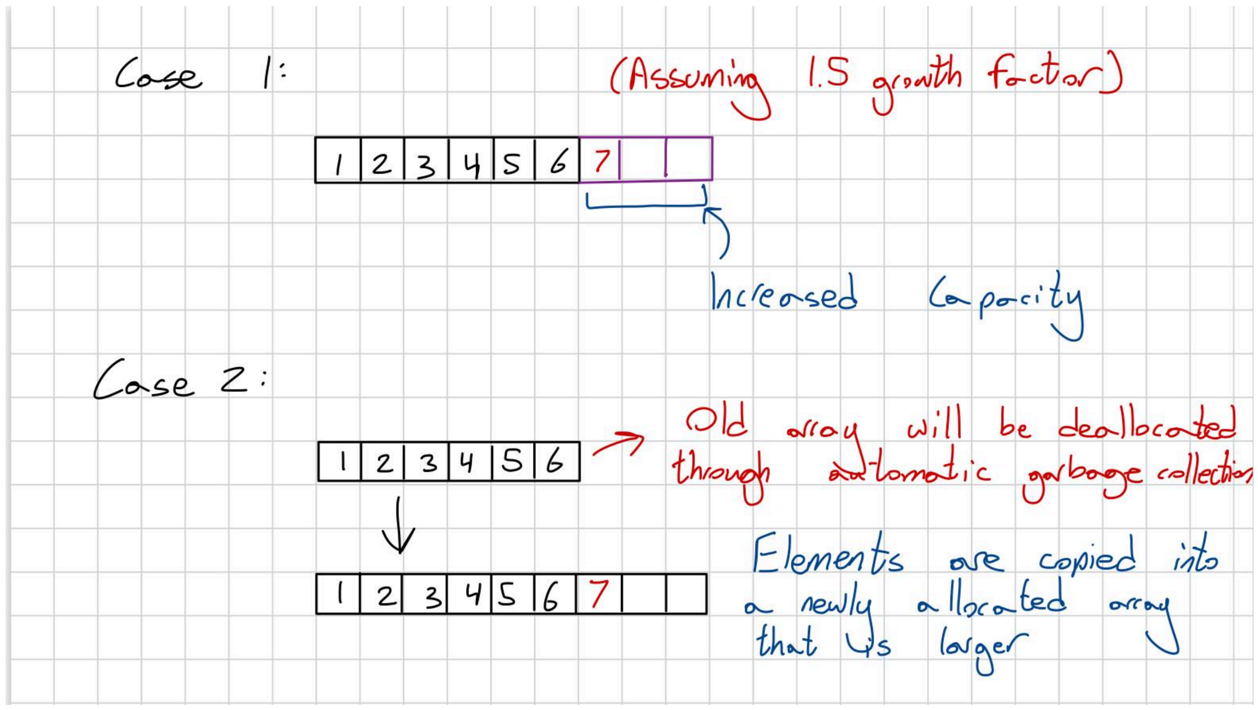
1. Array size is the number of positions that are actually storing elements whereas an array's capacity is the memory allocated to the array. The difference of this is that size is the number of spots that are filled in the array whereas the capacity is the number of spots that the array is limited to having before having to allocate more memory to the array.
2. When an array needs to grow beyond its current capacity, the capacity will actually increase by a factor. The exact value of this factory is typically dependent on the programming language. In the case of Python, it increases by a factory of 1.125

   For the following examples. Case 1 represents the instance in which there is free memory ahead of the array whereas Case 2 represents the instance where there is no space so the array's elements need to be copied into a newly allocated array. Case 2 has a complexity of O(n) due to the copying required.


Case 1:
(Assuming 1.5 growth factor)
1 2 3 4 5 6 7
Increased Capacity
Case 2:
1 2 3 4 5 6
Old array will be deallocated through automatic garbage collection
1 2 3 4 5 6 7
Elements are copied into a newly allocated array that is larger

3. One of the techniques that I've researched is over allocation in which instead of growing exactly to fit new elements, some implementations will actually opt to preallocate extra memory based on usage patterns, the amortized time complexity being O(1) on average. This is actually similar to what I described in section 1 of this pdf.

   Another implementation is lazy copying otherwise known as copy on write. This is where the system actually delays copying an array until a modification is actually needed. There will be two copies that point to the same array, and until any modification is needed, they will continue to point to the same array. Once modification does occur, the system creates a new copy of the array itself and the reference is now updated to point towards it. This effectively reduces duplicate data storage but it is no optimal for when frequent "writes" or modifications are expected to occur on the array.