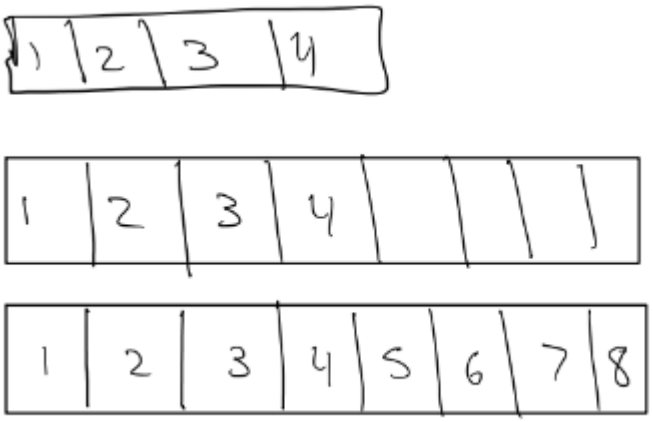
1.Explain the difference between an array size and capacity [0.2 pts]
The main difference between an array size and capacity, is that the array size is then number of cells that have data in them, and the capacity is the total numbr of cells.

2.What happen when an array needs to grow beyond its current capacity? Explain and produce a diagram showing the memory layout before and after expansion

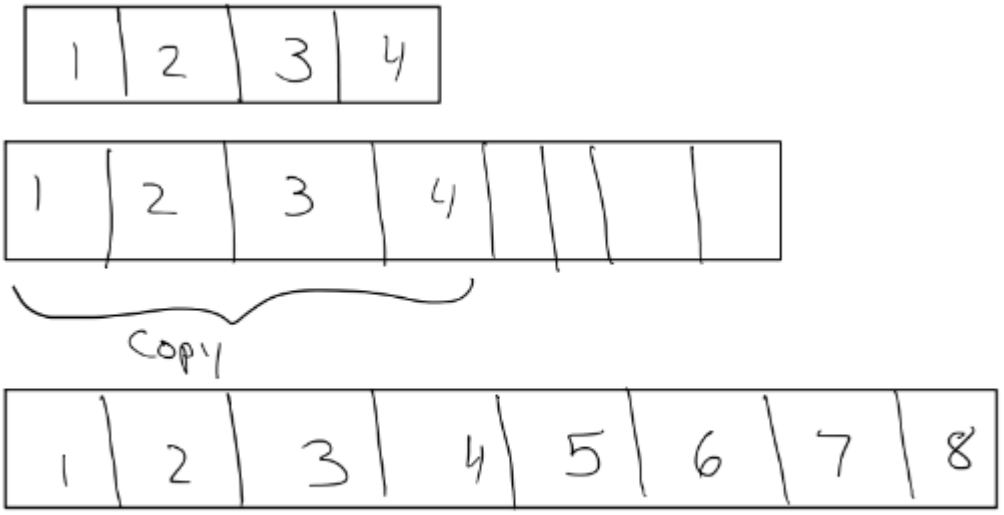
1.First, consider the case where there is space in memory after the end of the array [0.3 pts]

- If there is a space after the end of the array, then it makes it easier to accommodate new elements. Lets say we need add new elements, and expand the capacity, but since there is a a space at the end, then instead of allocating a whole new memory block, we can simply adjust the capacity to accommodate more elements. We can just directly add new elements without



2.Then, consider the case where the memory after the end of the array is occupied by another variable. What happens in that case? [0.3 pts]

- In this case we need to allocate a new block of memory with a larger capacity. Then we copy the old elements into the new array, once that is done then we deallocate the old block of memory in order to free up space. Finally we can add new elements into the expanded array.



3.Discuss one or more techniques real-world array implementations use to amortize the cost of array expansion [0.2 pts]

- Amortized analysis is a sequence of operations that guarantee a wrost case average time that is considered to be lower than the worst case time of an expensive operation.