Exercise 2

Question 1: Stored in the array, the actual number of elements currently present is called the array size. On the other hand, array capacity is an indication of the array's maximum size that can be achieved without overflowing or a need for extra memory allocation. So, it is the total amount of max elements that the array can hold.

Question 2: In the event there is available space in memory after the end of the array, the array just allocates the additional memory after the current end in array.

Before: _ _ _ X X

After: _ _ _ _ X X _ _ _

For memory after the end is occupied, or there is not enough space then the array allocates a new chunk of memory where available and it copies the old array into the new one with more space.

Before: _ _ _ X X X

After: (copied into) _ _ _ X X X _ _ _ N N N , where N is new space, and X/_ is elements or data

Question 3: Real world arrays require extra space, so they normally double in size often. The operation allows for more efficiency since resizing won't be an issue each time something new is added. Then, in a less frequent look the array grows, lowering the total cost for each extra piece of memory.