Lab3

2. Interview question: An array holds n integers, and all integers in A belong to the set {0, 1, 2}. Sort them...

Solution:

Algorithm: Sort (A)
Input: array of integers belongs to set {0, 1, 2}
Output: Sorted Array.

```
i ← 0
element ← 0
len ← array.length
temp ← 0
While A[element] < len do
    if A[element] = 0 then
        temp ← A[element]
        A[element] ← A[i]
        A[i] ← temp
        element ← element + 1
        i ← i + 1
    if A[element] = 1 then
        element ← element + 1
    if A[element] = 2 then
        temp ← A[element]
        A[element] ← A[len]
        A[i] ← temp
        A[len] ← temp
        len ← len - 1
return A.
```

In this case,
loop runs from 0 to n-1. Although there is if condition, it does not matter to complexity.
Hence,
Running time =
O(n)

Q.3

Algorithm: Count zero & one from Sorted Array of 0's & 1's
Input: Sorted array of 0s & 1s i.e. arr.
output: Total 1s & zeros in array.

```
i ← 0
len ← arr.length
zero ← 0
one ← 0
While(arr[i]
while i < len do
    if arr[i] = 0 then
        zero + +i;
```

While !arr[i] = 1 && i < len

zero ← zero + 1
i ← i + 1

While !arr[i] = 0 && i < len

one ← one + 1
i ← i + 1

Running time for algorithm

Above, algorithm will run from 0 to n-1. Although, there are two while loop the count begins from zero and stops when series of zero ended and again continues to count 1 until the array reach to the length len-1.