Algorithm 1:

Algorithm findDominator (arr , n){

    Candidate := -1

    Count := 0

    indecies[ ]

    For i:=0 to n do //O(n)

        if count = 0 then

            Candidate := arr[i]

        if Candidate = arr[i] then

            count := count + 1

        else

            count := count - 1

    if count <= 0 then

        return -1

    count := 0

    For i:=0 to n do //O(n)

        if arr[i] = Candidate then

            count := count + 1

    if count > n / 2 then

        j := 0

        For i:=0 to n do //O(n)

            if arr[i] = Candidate then

                indecies[j] := i

                j := j + 1

        return indecies

}

Analysis of algorithm 1:

Best case = O(N) => there is no dominator in the array it will return -1 after the 1st loop

Worst case = O(3N) => there is a dominator in the array and it will go via the 3 loops