Q6 [8 marks]: Design a binary search based algorithm to find the largest number in an array of N integers, a[0], a[1], ….a[N-1].

You may use structured plain English or a flow diagram as pseudo-code with statements as close as possible to the main statements of programming languages (e.g., SET, WHILE…DO, IF…THEN…ELSE). Subsequently, give the performance of this algorithm in Big-O notation and justify your answer

Q8 [11 marks]: You are given an unordered list of integers, which must be rearranged in ascending order by applying the Merge Sort algorithm.

Input Array: {38, 27, 43, 82, 3, 9, 10}

Instead of applying merge sort by splitting the array recursively into two halves and then start merging in sorted order, **you decide to skip the splitting** and get on with the merging part of it only, a.k.a. *natural merge sort.*

Explain what is the key idea behind this sorting algorithm, the algorithmic strategy being followed, and whether it exhibits a better performance when compared with the genuine merge sort algorithm.

Q6 [8 marks]: From the presentation video pick ONE Algorithm and do a design.

You may use structured plain English or a flow diagram as pseudo-code with statements as close as possible to the main statements of programming languages (e.g., SET, WHILE…DO, IF…THEN…ELSE). Subsequently, give the performance of this algorithm in Big-O notation and justify your answer