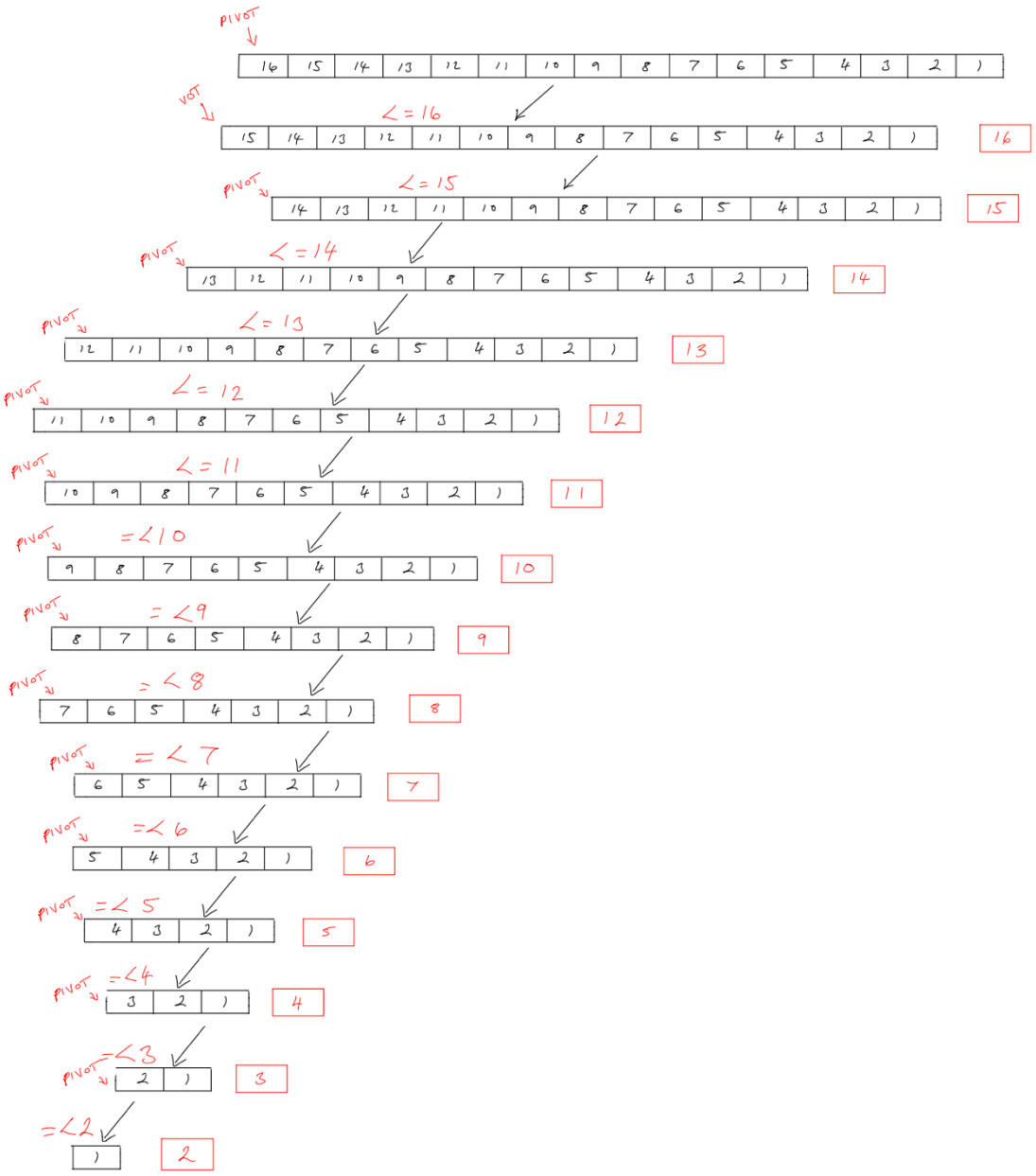
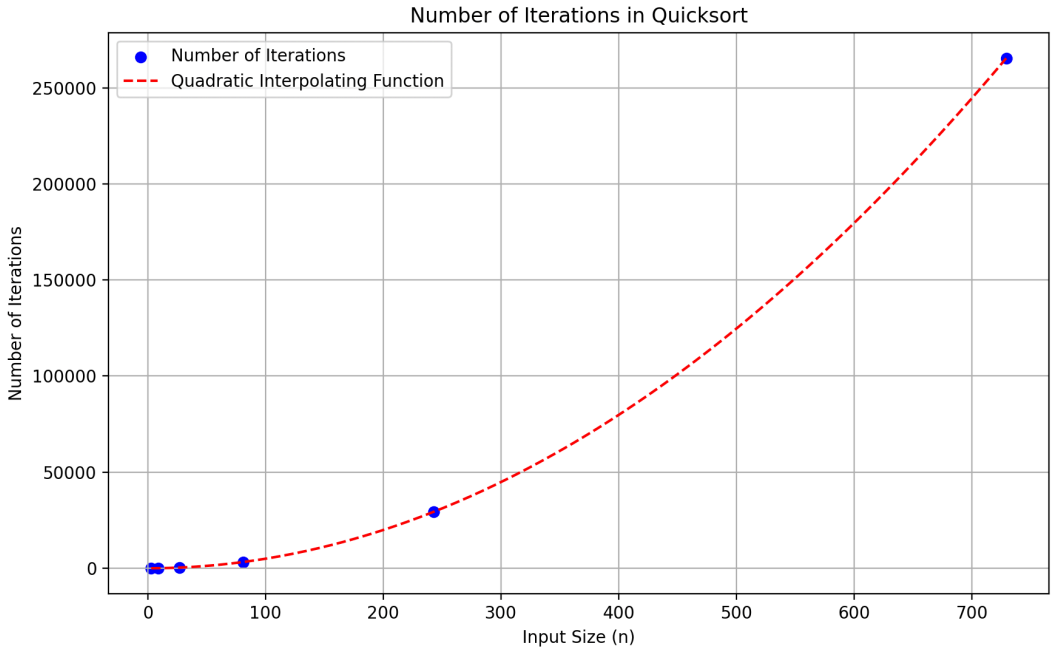
1. The worst case would be when the array is either sorted ascendingly or descending. This would mean that the pivot selection strategy will consistently lead to unbalanced partitions, which will cause the algorithm to complete a series of recursive calls with sub-arrays of size n – 1 and 0, and since there are n levels in the recursive tree, this gives a worst-case complexity of O(n^2).

2.



4.



As the graph shows, the results of the implementation of quicksort on various sizes incurring worst case complexity follow an exponential growth, evident by the quadratic interpolation graph, aligning with the worst-case complexity O(n^2).