

JIE MEI z5173405

Question2

That question will apply the algorithm of quick sort. First, we selected a nut as pivot. Then use this nut to divide the bolt into 3 parts: 1. Bolt smaller than pivot 2. Bolt larger than pivot 3. matching pivot. Secondly, take the matching bolt as pivot, and divide the remaining nuts into 3 parts: 1. Nut smaller than pivot 2. Nut larger than pivot 3. matching pivot. The third step is to divide the smaller bolts and nuts into a group, and the larger bolts and nuts into a group, and execute the above algorithm separately until all bolts and nuts are completely matched. The time complexity should be $O(n \log n)$. Because we divide the nuts or bolts in half each time, so we should have $\log n$ splits. Then each split will compare n times.