**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 pivot3.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 pivot3.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(nlogn). Because we divide the nuts or bolts in half each time, so we should have logn splits. Then each split will compare n times.**