This research is to study the Quicksort algorithm with codeword scheme for application of alphanumeric key sorting, and to investigate the appropriate data structure for implementation which can further improve the sorting performance. The present work is, in principle, based on the study of Baer and Lin for improving Quicksort algorithm. Although their technique shows significant improvement in efficiency by using codewords, but in the implementation, the result still produces unstable sorted list that needed further investigation.

The work here proposes a modified Quicksort routine (MQS) with codewords and the implementation by using a linked list structure. The codewords can be partitioned, not only into two groups as the previous work, but also into three or more groups, that shows even better improvement. Furthermore with linked list structure, the sorted result is proved to be stable!

The experimental results show that the MQS required fewer calls to the partition procedure, also the number of comparisons and bytes compared are greatly reduced. For the speed is concerned, the MQS takes approximately 50-60% of the time used by the Quicksort, and 55-70% by the Quicksort codeword based routine proposed by Baer and Lin.