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### **Abstract**

Skip list is a data structure with an ordered sequence of elements. It consists of layer of linked list. They consist of a layered structure and all nodes are in the bottom layer. These nodes are reduced to half towards upper layers and thus a pyramid-like structure is formed, which facilitates search, insertion and removal operations. A circular linked list is a type of linked list in which the last node of the list points back to the first node. In this paper we proposed a new data structure improved circular skip list (ICSL). ICSL is created with the help of circular linked list and skip list data structures. In circular linked list, operations are performed on a single round robin list. However, our new data structure consists of circular link lists formed in layers which are linked in a conical way with improved priority search feature. Time complexity of search, insertion and deletion equals to  $O(\log N)$  in an  $N$ -element improved circular skip list data structure. Improved circular skip list data structure is employed more effectively ( $O(\log N)$ ) in circumstances where circular linked lists ( $O(N)$ ) are used with improved priority searching technique.

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### Index Terms

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### Keywords

ICSL, Skip List