**SkipList Data Structure**

A Skip List is a [data structure](http://en.wikipedia.org/wiki/Data_structure) that allows fast search within an [ordered sequence](http://en.wikipedia.org/wiki/Ordered_sequence) of elements. Fast search is made possible by maintaining a [linked](http://en.wikipedia.org/wiki/Linked_list) hierarchy of subsequences, each skipping over fewer elements.

The methods implemented In SkipList are add (), ceiling (), contains (), findIndex (), first (), floor (),

IsEmpty (), last (), remove () and size ()

**Part-B**

**Comparing the performance of TreeSet and SkipList Data Structure**

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| Sl\_Number | Input\_Size | Time Taken by skip List | Input\_Size | Time Taken by Java’s Tree Set |
| 1 | 100 | 4 msec | 100 | 3 msec |
| 2 | 1000 | 24 msec | 1000 | 13 msec |
| 3 | 10000 | 88 msec | 10000 | 161 msec |

So by looking at the table we can clearly say Skip List gives better performance for large randomly generated numbers if skip list is implemented with rebuild() functionality.

**So how to Run to check the performance of TreeSet and SkipList**

Here in order to check the performance of TreeSet and SkipList go to

Run->Run Configuration

Then under the section MAIN

Select the project -> SkipListNXR150830

Then under the Section Main Class Select ->TreeMap.java

Then apply-Ok.

**You can clearly see SkipList performance is gradually better when compared to java’s TreeSet**.

**Classes in Project**

**SkipList.java** -> Here this class contains basic definition of a node I.e. node element and array of references to next element and a reference to previous element.

Also the Various algorithm that is used to implement functions of skip list like add(),remove(),contains(),first(),last() and others, the algorithm approach used is pretty much same as the class notes I.e. Lecture 13 Btrees,SkipLists.

**SkipListDriver.java** -> This is the main program that is used to run the SkipList Data structure.

**Timer.java**-> This contains as the name suggests how much time the program took to execute.

**TreeMap.java**  -> This class contains the code where you can compare the performance of Java’s Treeset with Skip List data structure.

**Part-A**

**So how to run the program to see various Functions of SkipList**

Here in order to check the The program to see various Functions of SkipList like add(),remove(),first(),last(),contains() go to

Run->Run Configuration

Then under the section **MAIN**

Select the project -> **SkipListNXR150830**

Then under the Section **Main Class** select ->**SkipListDriver.java**

Then under **Arguments -> Program Arguments** -> section enter the filename **a1.txt**

Then apply-Ok.