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README.pdf
pa2

Running Time:

SLCreate: This function takes constant time and does not depend on the size of the list.

SLDestroy: This function takes O(N) time because it has to traverse list in linear fashion and delete nodes.

create_node: This function also takes constant time because it does not depend on size of list.

SLInsert: This function takes O(N) time because it depends on the size of the list and traversing in linear fashion.

SLRemove: This function also takes O(N) time because it also traverses whole list.

SLCreateIterator: This function takes constant time.

SLDestroy: This function also takes constant time.

SLNextItem: Again, this function takes constant time.

SLGetItem: Lastly, this function also takes constant time.

Memory Usage:

The SLCreate allocates enough bytes for size of struct Sortedlist. In main.c, each insertion of data requires data allocation to actually store the data. In my testplan.txt we need to store enough bytes to store an integer.

create_node allocates enough bytes for size of Node.

SLCreateIterator allocates enough memory to hold struct SortedListIterator.

Freeing Memory:

Nodes are freed if their pointCount is equal to 0. If a node is removed using SLRemove but an iterator still points to it then it will not be freed since its pointCount is still >0.

Sorted list is freed once all of the notes it holds are freed. If a node is removed from list but an iterator still points to it and SLDestroy is called, it will destroy all of the nodes in the immediate list excluding the ones pointed to by the iterator.

Iterators are freed once the node that it points to is either freed or dereferenced. If an iterator is trying to be freed and the node it points is still in the list, then the iterator will simply point to NULL and then the iterator will be freed.

Conclusion:

This program runs in O(N) time. In hindsight, this program could be implemented using a max heap which would make it run faster by running in about O(nlog). Insertion would take O1) and everything else would take O(logn).