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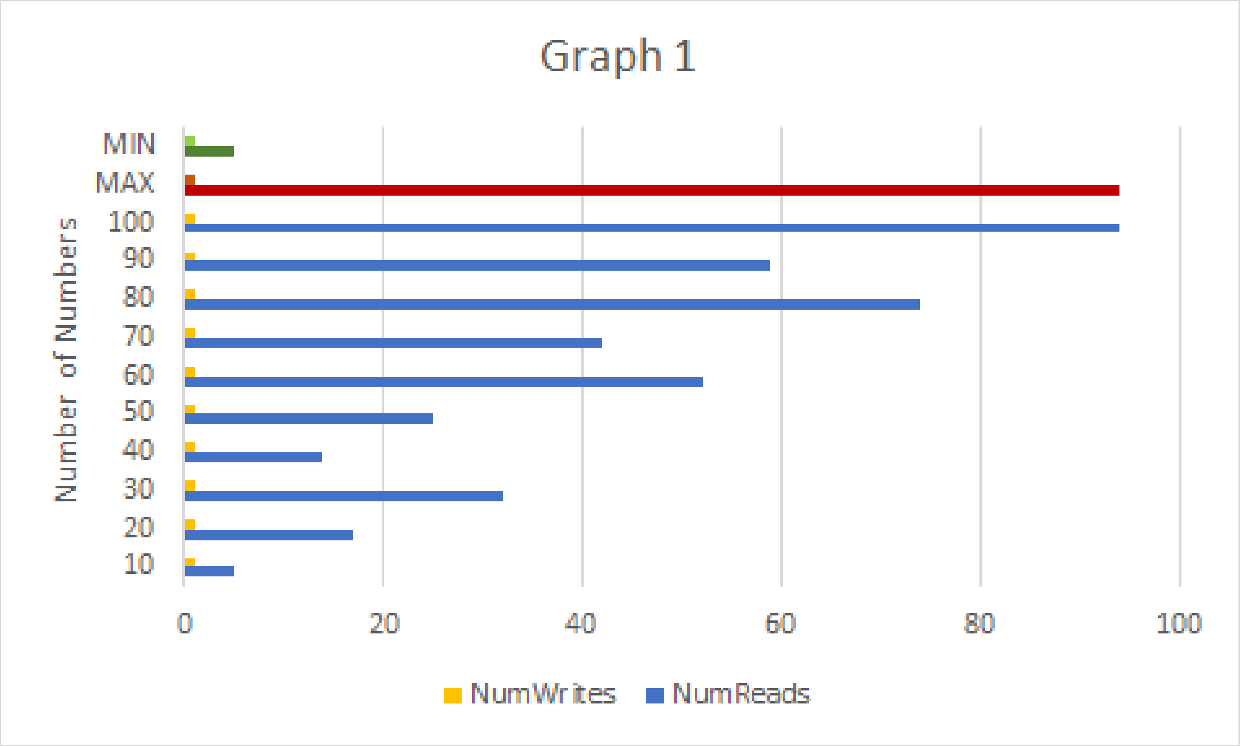
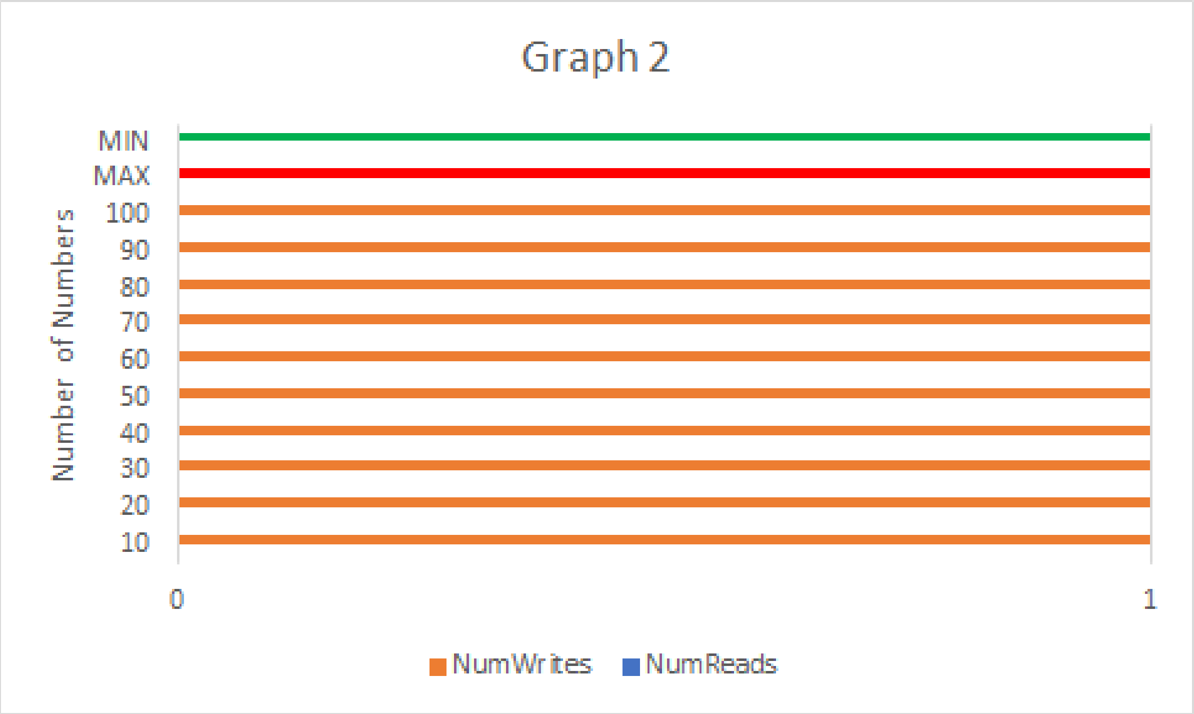
Here is the legend of graphs I am using:

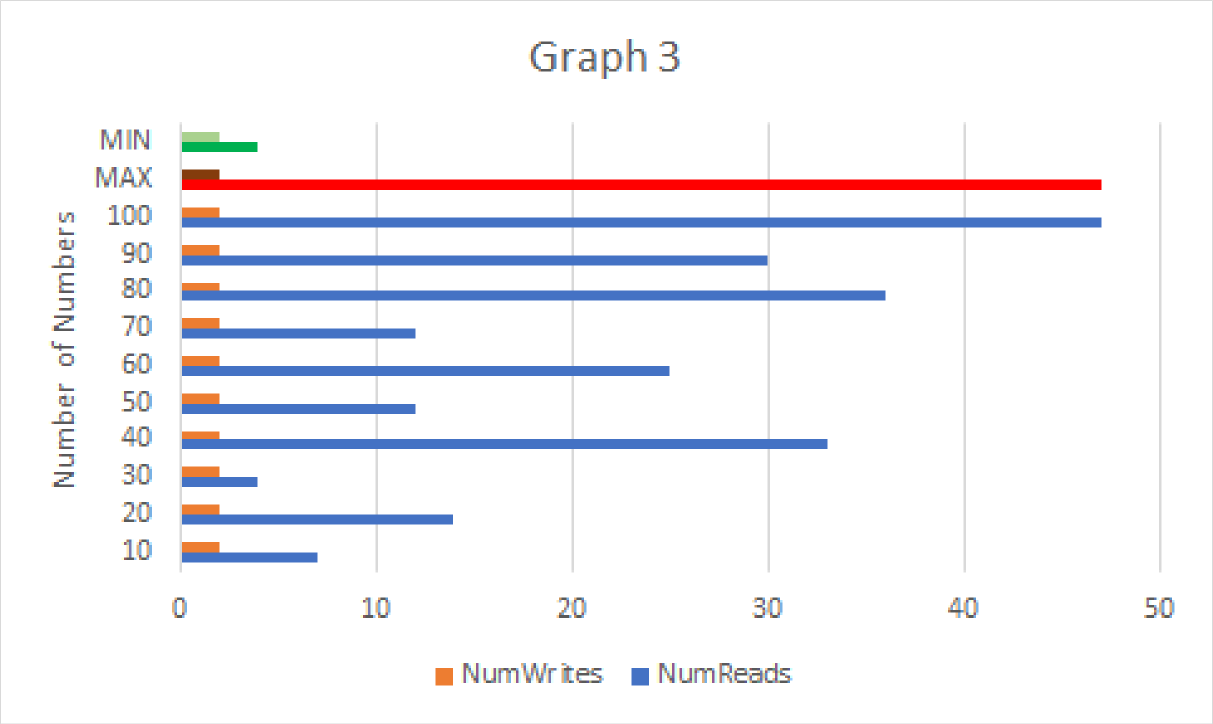
Graph #	Operation	Implementation
1	ds_replace	List
2	ds_replace	Array
3	ds_insert	List
4	ds_insert	Array
5	ds_delete	List
6	ds_delete	Array
7	ds_swap	List
8	ds_swap	Array

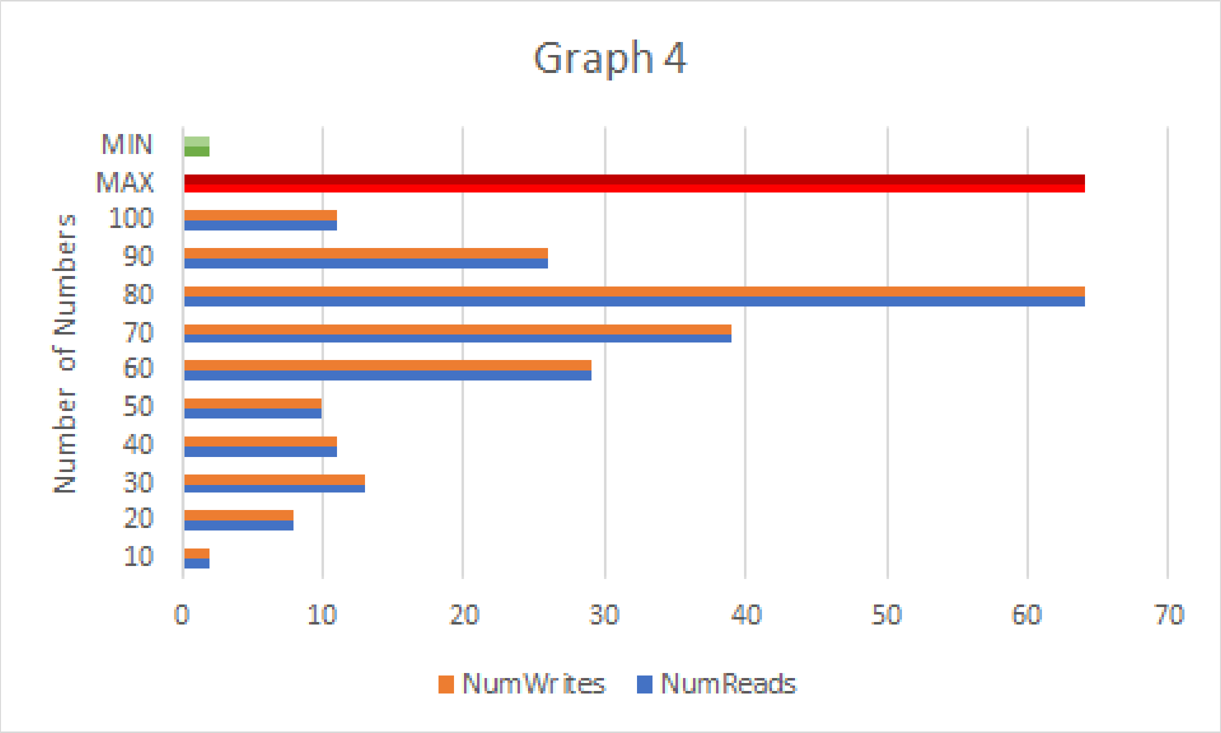
Graphs:

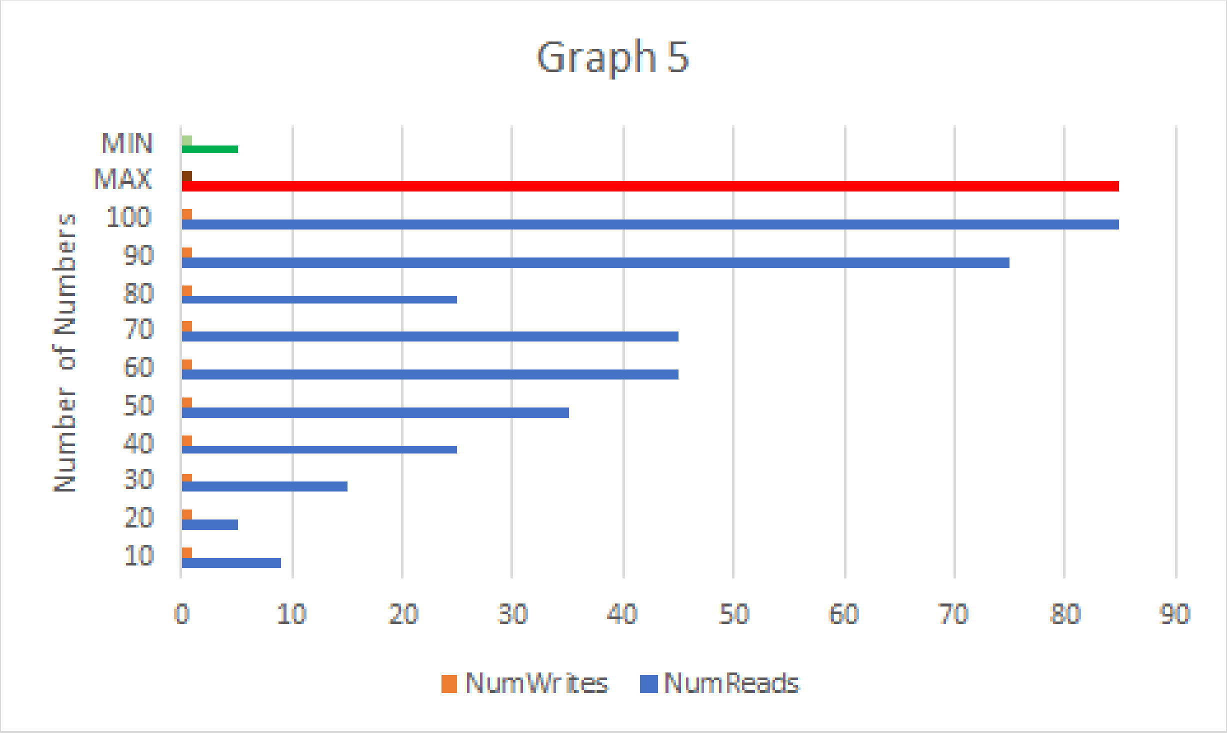


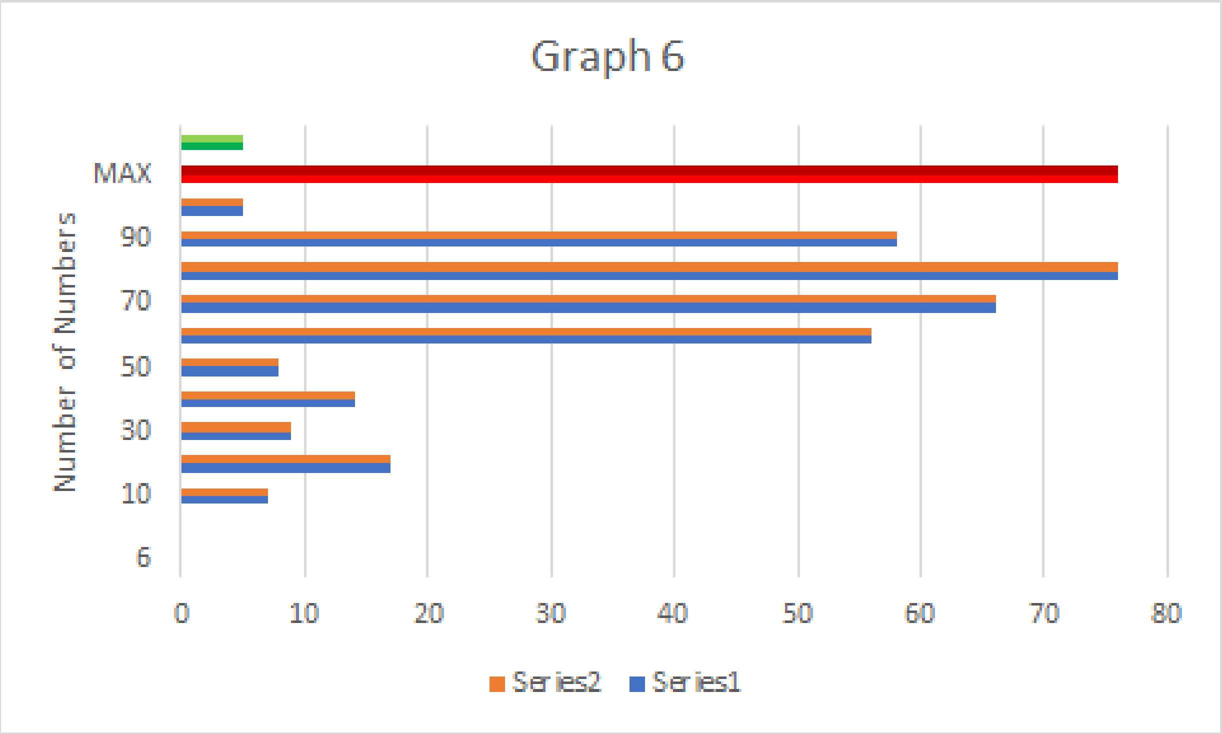


No, I haven't forgotten a data set here. Replacing a value in an array requires no reads, which is why the NumReads bars are absent.

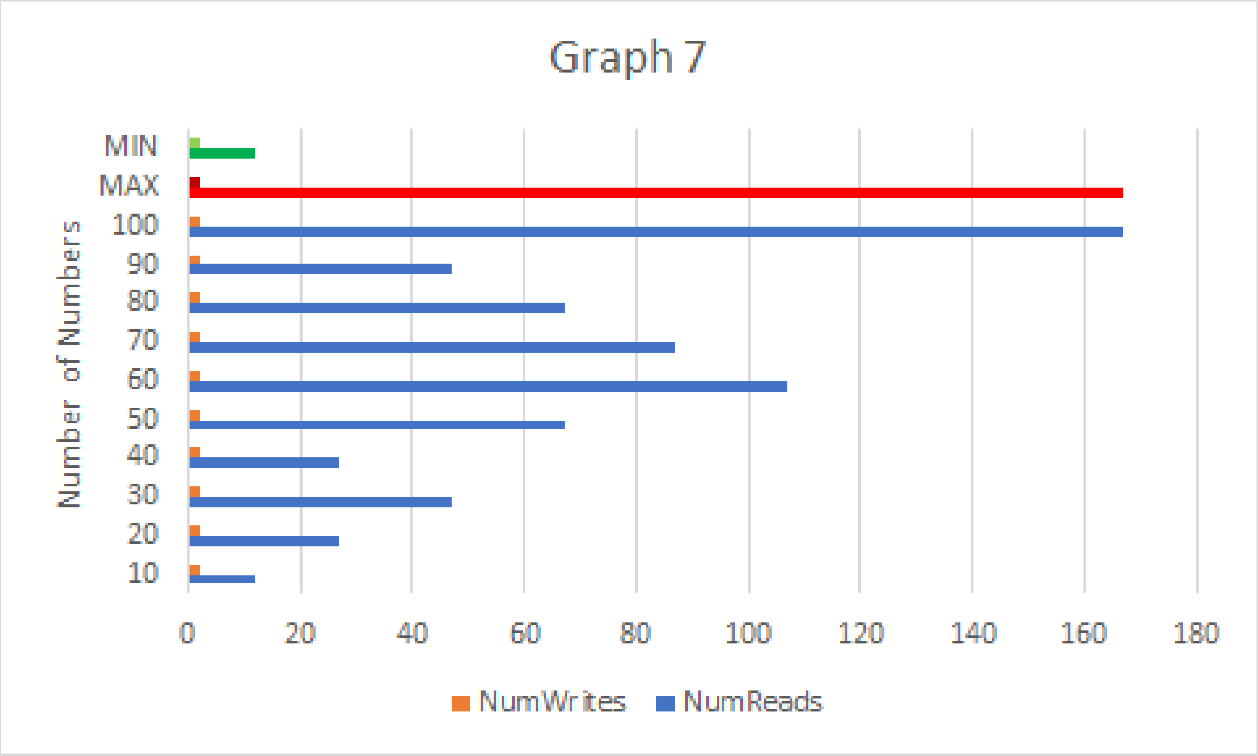



Graph 4
Number of Numbers
MIN
MAX
100
90
80
70
60
50
40
30
20
10
0
10
20
30
40
50
60
70
NumWrites
NumReads

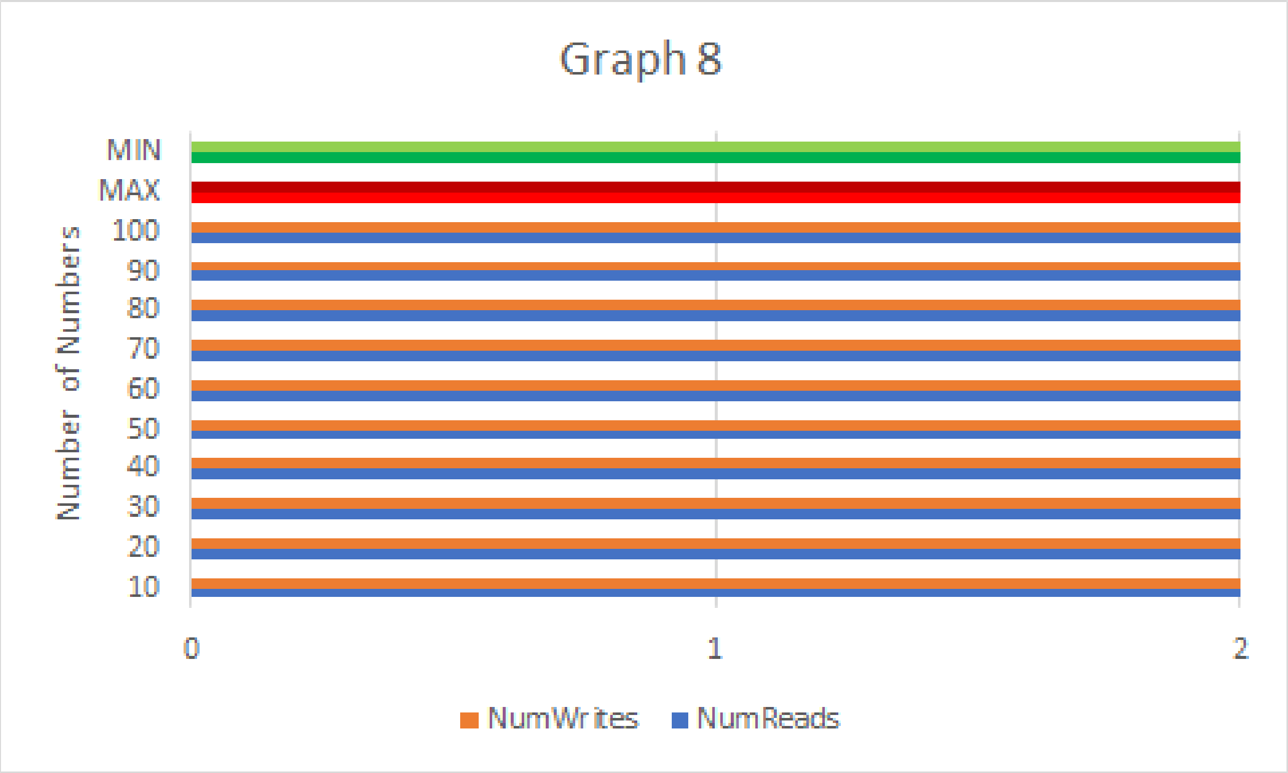

Graph 5
Number of Numbers
MIN
MAX
100
90
80
70
60
50
40
30
20
10
0
10
20
30
40
50
60
70
80
90
NumWrites
NumReads



Graph 6



Graph 7



OK, this graph looks weird but it's correct. Swapping two values in an array will only ever require two reads and two writes no matter the size of the array.

Discussion:

Looking at these graphs, we can extrapolate a few properties from each data structure. For one, the ratio of reads to write for linked lists is much greater than that of arrays. When I was coding, I noticed I had to use many more temporary variables to store information about the linked list. On the other hand, for arrays, much of the information could be gathered by calculating a certain value's position based on its index. This is especially obvious for ds_replace and ds_swap.

if a low writes count is needed or if the information being stored must be "scattered" across storage, then linked lists are favorable. I could see this data structure being used for a large database, where information will be stored across multiple drives, and those drives might not always be accessible under use. Databases would also not be able to accommodate an array large one-dimensional address space.

However, if quick access is needed, then arrays are stronger. For example, if a software like Microsoft Word does a lot of string manipulation, and enough space can be allocated just for the document, then an array data structure will be faster.