

Implement a SimpleTextEditor class which provides the some of the edit functionality of a text editor. The text is represented by a list of characters in your class. Your class should include a Java List. Your class should provide the following methods:

- Read method to read in a text file and construct the text.
- Add method that adds one or more characters (given as a string) at the specified position (given as an integer index) in your text.
- Find method that returns the start index of the first occurrence of the searched group of characters.
- Replace method that replaces all occurrences of a character with another character.

Write two implementations:

You have to write two versions of each method:

- by using the iterator (ListIterator) to navigate on the List
- without using the iterator, using simple for loop with index structure

So, there will be eight methods in total.

Write a Main class which:

- Tests each method of the SimpleTextEditor class.
- Measures the running time of your implementation for various text sizes.
- Creates a readable log file of the test.

You should write a report for this question including the following

- Analysis of the performance of each method theoretically using the most appropriate asymptotic notation. Present the analysis for the following cases:
  - List is an ArrayList and iterator is used
  - List is an ArrayList and iterator is not used
  - List is a LinkedList and iterator is used
  - List is a LinkedList and iterator is not used
- Comparison of the experimental performance of each operation when
  - List is an ArrayList and iterator is used
  - List is an ArrayList and iterator is not used
  - List is a LinkedList and iterator is used
  - List is a LinkedList and iterator is not used