HW3: Suggestions

CSS 342 – Data Structures, Algorithms, and Discrete Mathematics I
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Summary

It used to be the case where search terms had to be exact for any results to come up. Nowadays, however, most search engines are intelligent enough to recognize mis-spelled words/terms as well as provide suggestions. This is yet another form of everyday "magic" that manifests itself in several different ways (e.g. Intellisense, autocorrect, etc. Explore a basic implementation of this as well as the time complexity of your implementation.

Skills Expected

- Linked Structures
- Algorithm: Searching and Sorting
- Big-O Notation

Assignment Description

Create a data structure (anything) used to keep track of objects (use templates) containing at least one sortable property (e.g. item for sale { price, size }, books { author, title, genre }, etc.). Implement a search function that will return:

- Object with the searched property (if any)
- Additional suggestions (similar objects to the one searched)
- Rankings of most likely to least likely results (display at least 3 results)

You will also need to provide a Big-O analysis of your search algorithm.

Grading Criteria

- Implementation ***(10 Points Total):***
  - [2 Points] Use of templates for given data structure
  - [2 Points] Basic search method (finds the object that is searched for)
  - Additional search functionality
    - [4 Points] Additional suggestions
    - [4 Points] Rankings of most likely to least likely results
- Demonstration ***(8 Points Total):***
  - [1 Point] Written instructions on how to execute your program
  - [1 Point] Screen capture of program execution
  - [1 Point] A structure containing at least 10 items to search through
  - [1 Point] Demonstration of search where search term is found
  - [1 Point] Demonstration of search where search term is NOT found
  - [1 Point] Demonstration of search after items in the data structure has been added/modified/removed
- Big-O Analysis ***(2 Points Total):***
  - [2 Points] Search algorithm analysis
- Extra Credit:
  - [2 Points] Search algorithm that has O(log n) complexity
  - [2 Points] Tree data structure (own implementation, NOT STL)