CE205 Data Structures

Week-11

String Data Structures

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Outline

- Strings
  -Longest common subsequence problem
  - Longest increasing subsequence
  - Hunt–Szymanski algorithm (Hunt Macllory)
  - Levenshtein distance
  - Wagner–Fischer algorithm
  - String Alignment
    - Needleman Wunsch
    - Smith Waterman
    - Hunt Macllory
  - String Tokenizer
  - String Comparison

Strings

- https://www.geeksforgeeks.org/string-data-structure/

Longest common subsequence problem

- https://ucoruh.github.io/ce100-algorithms-and-programming-II/week-6/ce100-week-6-lcs/?h=lcs#problem-3-longest-common-subsequence

- https://www.geeksforgeeks.org/longest-common-subsequence-dp-4/

- https://www.programiz.com/dsa/longest-common-subsequence

Longest common subsequence problem

Longest increasing subsequence

- https://www.geeksforgeeks.org/longest-increasing-subsequence-dp-3/#:~:text=The Longest Increasing Subsequence (LIS) problem is to find the,50%2C 60%2C 80}.

- https://cp-algorithms.com/sequences/longest_increasing_subsequence.html

Longest common subsequence problem

Hunt–Szymanski algorithm (Hunt MacIlory)

- https://en.wikipedia.org/wiki/Hunt–Szymanski_algorithm

- https://www.geeksforgeeks.org/python-program-for-longest-common-subsequence/?ref=gcse

- https://imada.sdu.dk/~rolf/Edu/DM823/E16/HuntSzymanski.pdf

- https://github.com/LetsTrie/Code-Library-Of-Others/blob/master/sgtlaugh/Hunt-Szymanski.cpp

Longest common subsequence problem

Levenshtein distance

- https://en.wikipedia.org/wiki/Levenshtein_distance

- https://www.geeksforgeeks.org/java-program-to-implement-levenshtein-distance-computing-algorithm/?ref=gcse

- https://medium.com/@ethannam/understanding-the-levenshtein-distance-equation-for-beginners-c4285a5604f0

- https://www.educative.io/answers/the-levenshtein-distance-algorithm

Longest common subsequence problem

Wagner–Fischer algorithm

- https://en.wikipedia.org/wiki/Wagner–Fischer_algorithm
- https://www.geeksforgeeks.org/java-program-to-implement-wagner-and-fisher-algorithm-for-online-string-matching/

String Alignment

- https://www.geeksforgeeks.org/sequence-alignment-problem/?ref=gcse

String Alignment

Needleman Wunsch

- https://en.wikipedia.org/wiki/Needleman–Wunsch_algorithm

- https://www.geeksforgeeks.org/sequence-alignment-problem/?ref=gcse

- https://berthub.eu/nwunsch/

- http://experiments.mostafa.io/public/needleman-wunsch/index.html

- https://zhanggroup.org/NW-align/

String Alignment

Smith Waterman

- https://en.wikipedia.org/wiki/Smith–Waterman_algorithm

- http://jaligner.sourceforge.net/

- http://baba.sourceforge.net/

- https://doc.ugene.net/wiki/display/UUOUM15/Smith-Waterman+Search

- https://www.ebi.ac.uk/Tools/sss/fasta/

String Alignment

Hunt Macllory

- https://en.wikipedia.org/wiki/Hunt–Szymanski_algorithm

- https://www.geeksforgeeks.org/python-program-for-longest-common-subsequence/?ref=gcse

- https://imada.sdu.dk/~rolf/Edu/DM823/E16/HuntSzymanski.pdf

- https://github.com/LetsTrie/Code-Library-Of-Others/blob/master/sgtlaugh/Hunt-Szymanski.cpp

String Tokenizer

- https://towardsdatascience.com/tokenization-algorithms-explained-e25d5f4322ac
- https://www.oreilly.com/library/view/applied-natural-language/9781492062561/ch04.html
- https://www.geeksforgeeks.org/nlp-how-tokenizing-text-sentence-words-works/?ref=gcse
- https://github.com/frohoff/jdk8u-dev-jdk/blob/master/src/share/classes/java/util/StringTokenizer.java

String Comparison

- https://en.wikipedia.org/wiki/String-searching_algorithm

- https://www.geeksforgeeks.org/compare-two-strings-in-java/

- https://www.geeksforgeeks.org/comparing-two-strings-cpp/

$$End - Of - Week - 11$$