

CE205 Data Structures Week-11

String Data Structure, Subsequence Search, Alignment and Comparison Algorithms.

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1 CE205 Data Structures

1.1 Week-11

1.1.1 String Data Structures

Download PDF¹,DOCX², SLIDE³, PPTX⁴

1.1.2 Outline

- Strings -Longest common subsequence problem
 - Longest increasing subsequence
 - Huntâ€™Szymanski algorithm (Hunt Macllory)
 - Levenshtein distance
 - Wagnerâ€™Fischer algorithm
 - String Alignment
 - * Needleman Wunsch
 - * Smith Waterman
 - * Hunt Macllory
 - String Tokenizer
 - String Comparison

1.1.3 Strings

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

¹pandoc_ce205-week-11-string-structures.tr_doc.pdf

²pandoc_ce205-week-11-string-structures.tr_word.docx

³ce205-week-11-string-structures.tr_slide.pdf

⁴ce205-week-11-string-structures.tr_slide.pptx

1.1.3.1 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>

1.1.3.2 Longest common subsequence problem

1.1.3.2.1 Longest increasing subsequence

- <https://www.geeksforgeeks.org/longest-increasing-subsequence-dp-3/#:~:text=The%20Longest%20Increasing%20Subs>
- https://cp-algorithms.com/sequences/longest_increasing_subsequence.html

1.1.3.3 Longest common subsequence problem

1.1.3.3.1 Hunt’s Szymanski algorithm (Hunt Macllory)

- https://en.wikipedia.org/wiki/Hunt%E2%80%93Szymanski_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>

1.1.3.4 Longest common subsequence problem

1.1.3.4.1 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>

1.1.3.5 Longest common subsequence problem

1.1.3.5.1 Wagner’s Fischer algorithm

- https://en.wikipedia.org/wiki/Wagner%E2%80%93Fischer_algorithm
- <https://www.geeksforgeeks.org/java-program-to-implement-wagner-and-fisher-algorithm-for-online-string-matching/>

1.1.3.6 String Alignment

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

1.1.3.7 String Alignment

1.1.3.7.1 Needleman Wunsch

- https://en.wikipedia.org/wiki/Needleman%E2%80%93Wunsch_algorithm
- <https://www.geeksforgeeks.org/sequence-alignment-problem/?ref=gcse>
- <https://berthub.eu/nwunsch/>
- <http://experiments.mostafa.io/public/needleman-wunsch/index.html>
- <https://zhangroup.org/NW-align/>

1.1.3.8 String Alignment

1.1.3.8.1 Smith Waterman

- https://en.wikipedia.org/wiki/Smith%E2%80%93Waterman_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/>

1.1.3.9 String Alignment

1.1.3.9.1 Hunt Macllory

- https://en.wikipedia.org/wiki/Hunt%E2%80%93Szymanski_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>

1.1.3.10 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>

1.1.3.11 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