# CE205 Data Structures Week-11

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

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    - Smith Waterman
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  - String Tokenizer
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### 1.1.3 Strings

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

[1] pandoc_ce205-week-11-string-structures.en_doc.pdf

[2] pandoc_ce205-week-11-string-structures.en_word.docx

[3] ce205-week-11-string-structures.en_slide.pdf

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### 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 Huntâ€“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 Wagnerâ€“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://zhanggroup.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/

$$End - Of - Week - 11$$