

# CE205 Data Structures

## Week-12

String Search Algorithms, Tries, Data Structures for Disjoint Sets

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- Strings
  - Reverse Factor Algorithm (String Search)
    - Knuth-Morris-Pratt Algorithm
    - Horspool Algorithm
    - Boyer-Moore Algorithm
    - Brute-Force / Linear Text Search
    - DFA Text Search
  - Tries
    - Patricia Tree (Radix Tree)
  - Data Structures for Disjoint Sets
    - Disjoint-set operations
    - Linked-list representation of disjoint sets
    - Disjoint-set forests
    - Analysis of union by rank with path compression

## Strings - Reverse Factor Algorithm (String Search)

### Knuth-Morris-Pratt Algorithm

- [https://en.wikipedia.org/wiki/Knuth–Morris–Pratt\\_algorithm](https://en.wikipedia.org/wiki/Knuth–Morris–Pratt_algorithm)
- <https://www.geeksforgeeks.org/kmp-algorithm-for-pattern-searching/>
- <https://www.javatpoint.com/daa-knuth-morris-pratt-algorithm>
- <https://www.educative.io/answers/what-is-the-knuth-morris-pratt-algorithm>
- [http://www.btechsmartclass.com/data\\_structures/knuth-morris-pratt-algorithm.html](http://www.btechsmartclass.com/data_structures/knuth-morris-pratt-algorithm.html)
- <https://www-igm.univ-mlv.fr/~lecroq/string/node32.html#SECTION00320>
- <https://algs4.cs.princeton.edu/lectures/keynote/53SubstringSearch.pdf>

## Strings - Reverse Factor Algorithm (String Search)

### Horspool Algorithm

- [https://en.wikipedia.org/wiki/Boyer–Moore–Horspool\\_algorithm](https://en.wikipedia.org/wiki/Boyer–Moore–Horspool_algorithm)
- <https://www.inf.hs-flensburg.de/lang/algorithmen/pattern/horsen.htm>
- <https://www-igm.univ-mlv.fr/~lecroq/string/node18.html>

## Strings - Reverse Factor Algorithm (String Search)

### Boyer-Moore Algorithm

- [https://en.wikipedia.org/wiki/Boyer-Moore\\_string-search\\_algorithm](https://en.wikipedia.org/wiki/Boyer-Moore_string-search_algorithm)
- <https://www.geeksforgeeks.org/boyer-moore-algorithm-for-pattern-searching/?ref=gcse>

## Strings - Reverse Factor Algorithm (String Search)

### Brute-Force / Linear Text Search

- <https://algs4.cs.princeton.edu/lectures/keynote/53SubstringSearch.pdf>

## Strings - Reverse Factor Algorithm (String Search)

### DFA (deterministic finite automaton) Text Search

- <https://www.geeksforgeeks.org/finite-automata-algorithm-for-pattern-searching/>

## Tries

### Patricia Tree (Radix Tree)

- [https://en.wikipedia.org/wiki/Radix\\_tree](https://en.wikipedia.org/wiki/Radix_tree)
- [http://www.btechsmartclass.com/data\\_structures/tries.html](http://www.btechsmartclass.com/data_structures/tries.html)
- <https://www.geeksforgeeks.org/implementing-patricia-trie-in-java/>



## Data Structures for Disjoint Sets

- <https://ucoruh.github.io/ce100-algorithms-and-programming-II/week-10/ce100-week-10-graphs/?h=disjoint#disjoint-set-operations>
- Disjoint-set operations
- Linked-list representation of disjoint sets
- Disjoint-set forests
- Analysis of union by rank with path compression
- <https://www.geeksforgeeks.org/disjoint-set-data-structures/>
- <https://www.javatpoint.com/disjoint-set-data-structure>

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