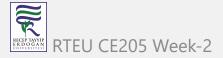# CE205 Data Structures

Week-2

Linked Lists and Related Algorithms Arrays and Matrices

Download DOC, SLIDE, PPTX

<iframe width=700, height=500 frameBorder=0 src="../ce205-week-2-linkedlist.md_slide.html"></iframe>

Outline-1

- Resources
- ASN.1 C Workshop
- Single Linked List
- Circular Linked List
- Double Linked List
- XOR Linked List
- Skip List
- Strand Sort

Outline-2

- Arrays
  - Array Rotations
  - Arrangement Rearrangement
  - Array Searching and Sorting
- Matrix
- Sparse Matrix

Resources

- WilliamFiset
  - WilliamFiset - YouTube
  - GitHub - williamfiset/Algorithms: A collection of algorithms and data structures
- Btech Smart Class
  - Data Structures Tutorials - Introduction to Algorithms
- Programiz
  - Data Structure and Types
- GeeksforGeeks
  - Array Data Structure - GeeksforGeeks
- Visual Algo
  - https://visualgo.net/en

Workshop

Follow the link below and complete steps.

- https://github.com/ucoruh/asn1c-wsl-sample

There are quick start and reference guides

- http://lionet.info/asn1c/asn1c-quick.pdf

- http://lionet.info/asn1c/asn1c-usage.pdf

- https://www.itu.int/ITU-T/studygroups/com17/languages/

Workshop

Visit TÜBİTAK KAMU SM MA3API Web Page

- https://yazilim.kamusm.gov.tr/?q=tr/node/19&language=en
- https://yazilim.kamusm.gov.tr/?q=/node/14

Workshop

Check out ASN.1 encoded standards.

- ETSI TS 101 733 CADES digital signature (ASN data structure)
  - https://www.etsi.org/deliver/etsi_ts/101700_101799/101733/02.02.01_60/ts_101733v020201p.pdf

- ETSI TS 102 778 PADES digital signature (PDF data structure)
  - https://www.etsi.org/deliver/etsi_ts/102700_102799/10277803/01.02.01_60/ts_10277803v010201p.pdf

- ETSI TS 101 903 XADES digital signature (XML data structure)
  - https://www.etsi.org/deliver/etsi_ts/101900_101999/101903/01.04.02_60/ts_101903v010402p.pdf

- ETSI TS 102 918 ASiC digital signature
  - https://www.etsi.org/deliver/etsi_ts/102900_102999/102918/01.03.01_60/ts_102918v010301p.pdf

Workshop

Check out ASN.1 encoded standards.

- Also there is An Implementation of CAdES, XAdES, PAdES and ASiC for Windows in C++
  - https://github.com/WindowsNT/AdES

Workshop

Telecom Standard Example for ASN.1

- https://www.etsi.org/deliver/etsi_ts/125400_125499/125413/04.09.00_60/ts_125413 v040900p.pdf

Workshop

Industrial Data Standards - Payment

- TLV Utilities
  - https://paymentcardtools.com/
  - https://emvlab.org/dumpasn1/
- Sample EMV ASN.1
  - https://github.com/mmattice/emv-asn1

Workshop

Industrial Data Standards - Telco

ASN.1 Standartları

- ETSI
  - https://portal.etsi.org/Services/Centre-for-Testing-Interoperability/ETSI-Approach/Specification-Languages/ASN1
- ITU-T
  - https://www.itu.int/ITU-T/recommendations/fl.aspx?lang=1
- ASN.1 Book
  - https://www.oss.com/asn1/resources/books-whitepapers-pubs/dubuisson-asn1-book.PDF

Workshop

Network Measurement Results Data

- NMR
  - https://www.etsi.org/deliver/etsi_ts/101500_101599/101503/08.27.00_60/ts_101503v082700p.pdf
- GSM API
  - https://www.etsi.org/deliver/etsi_ts/101400_101499/101476/08.04.01_60/ts_101476v080401p.pdf
- UTRAN
  - https://www.etsi.org/deliver/etsi_ts/125300_125399/125331/13.01.00_60/ts_125331v130100p.pdf
- E-UTRAN
  - https://www.etsi.org/deliver/etsi_ts/136300_136399/136331/15.03.00_60/ts_136331v150300p.pdf

Single Linked List

- Btech Smart Class
  - [Data Structures Tutorials - Single Linked List with an example](#)

- Visual Algo
  - https://visualgo.net/en/list

Circular Linked List

- Btech Smart Class
  - Data Structures Tutorials - Circular Linked List with an example | Implementation

- Geeks for Geeks
  - Circular Linked List | Set 1 (Introduction and Applications) - GeeksforGeeks

- Geeks for Geeks
  - Circular Linked List | Set 2 (Traversal) - GeeksforGeeks

Double Linked List

- Btech Smart Class
  - Data Structures Tutorials - Double Linked List with an example program
- Geeks for Geeks
  - Doubly Linked List | Set 1 (Introduction and Insertion) - GeeksforGeeks
- Visual Algo
  - Linked List (Single, Doubly), Stack, Queue, Deque - VisuAlgo

XOR Linked List

- Wikipedia
  - XOR linked list - Wikipedia
- Geeks for Geeks
  - XOR Linked List - A Memory Efficient Doubly Linked List | Set 1 - GeeksforGeeks
- Geeks for Geeks
  - XOR Linked List – A Memory Efficient Doubly Linked List | Set 2 - GeeksforGeeks

Skip List

- Wikipedia

  - Skip list - Wikipedia

- Geeks for Geeks

  - Skip List | Set 1 (Introduction) - GeeksforGeeks

  - Skip List | Set 2 (Insertion) - GeeksforGeeks

  - Skip List | Set 3 (Searching and Deletion) - GeeksforGeeks

Strand Sort

- Geeks for Geeks
  - Strand Sort - GeeksforGeeks

Arrays

- Geeks for Geeks
  - Array Data Structure - GeeksforGeeks
  - Data structures Tutorials - Arrays
  - Circular array - GeeksforGeeks

Array Rotations

- Geeks for Geeks
  - Program for array rotation - GeeksforGeeks

Arrangement Rearrangement

- Geeks for Geeks
    - Array Rearrangement - GeeksforGeeks

Array Searching and Sorting

- Geeks for Geeks
  - Difference between Searching and Sorting Algorithms - GeeksforGeeks

Matrix

- Geeks for Geeks
  - Matrix Archives - GeeksforGeeks

Sparse Matrix

- Geeks for Geeks
  - Data Structures Tutorials - Sparse Matrix with an example

$$End - Of - Week - 2$$