
Questions Short Summery

CIT 211 (DSA) ~ 2024 ~ r1

Question Sets considered

1. Session 20-21
2. Session 19-20
3. Session 18-19

By no means, this is any sorts of suggestions. Just a quick overview!
Nothing more, nothing less :)

And yah, can be inaccurate! Feel free to criticize.

Chapter 1-2 (Basic)

Definition

1. Data
2. Entity
3. Attribute
4. Records
5. Data Structure *
6. Pseudo-code

Explanation

1. Algorithm complexity (time-space trade-off)
2. Linear vs non-linear (with examples) **
3. Big Oh, Omega, Theta asymptotic notation
4. Operations on data structure *
5. "Algorithm and procedure" – briefly explain *
6. Complexity of,
 1. quick sort
 2. insertion sort
 3. radix sort
 4. mergin sort

Simulation

1. Calculate complexity

Chapter 3 (String)

Definition

Explanation

Simulation

Chapter 4 (Array)

Definition

1. List/ Array
2. Linear Array

Explanation

1. Linear array representation in memory
2. Multi-dimension array representation in memory
3. Array (disadvantages)
4. Array multiplication (with dimension control)
5. length and dimension of matrix
6. Address calculate (18-19 → ...)

Simulation

1. Basic loop operation (2022-1(b))
2. Array basic operations
3. Insertion
4. finding/ counting
5. binary search

Chapter 5 (Linked List)

Definition

1. Garbage collection
2. header linked list

Explanation

1. Recovering disadvantages of array with linked list *
2. Figure drawing
3. Linked list representation in memory (with free storage) *
4. overflow vs underflow
5. 2 way list (diagram) *
6. grounded header vs circular

Simulation

1. Insertion (with diagram)
2. Deletion *

Chapter 6 (Stack-Queue)

Definition

Explanation

1. Recursive solution to Towers of Hanoi (with complexity)
2. Recursion vs iteration
3. Divide and conquer procedure
4. Recursion
 1. Advantages
 2. Disadvantages
 3. characteristics (19-20 → 6(a))
5. stack vs queue (application)
6. Complexity of quick sort

Simulation

1. Insertion
2. Infix to postfix/ postfix (inspection by hand) **
3. Evaluate postfix
4. Queue operation (memory based) *
5. Fibonacci sequence
6. Quicksort (to find final position) *
7. Recursive solution simulation (19-20 → last)
8. Merge 2 sorted array

Chapter 7 (Trees)

Definition

1. Binary Tree *
2. Complete binary tree
3. Extended binary tree
4. depth of a tree *
5. General tree
6. ancestor of a node
7. descendant of a node

Explanation

1. Linked representation of the binary tree in memory
2. Sequential representation in memory
3. binary search tree – properties

Simulation

1. Traversal (preorder)
2. Traversal (inorder)
3. Heap insertion
4. insertion procedure of binary search tree
5. building binary search tree

Chapter 8 (Graph)

Definition

1. Finite graph
2. tree graph
3. strongly connected graph (with figure)
4. multi graph
5. complete graph
6. Topological sort

Explanation

1. Weighted graph draw
2. warshall
3. Linked representation → draw
4. Weighted graph → Linked representation
5. 2 different data structure for representing graph
6. Show "The sum of the degree of all the vertices in a graph is always even"
7. graph → adjacency matrix
8. adjacency matrix → path matrix
9. BFS vs DFS
10. Indegree, outdegree, sources, sinks

Simulation

1. Topological sorting
2. BFS *
3. DFS
4. Bubble sort
5. Graph → adjacency matrix
6. modified warshall (shortest path)

Extras ::

Somewhat available on chapter 9

Definition

Explanation

1. Binary search (def, limits)
2. Modify binary search for searching and insertion

Simulation

1. Bubble sort
2. Selection *
3. Radix sort