NPTEL Video Course - Computer Science and Engineering - NOC:Second Level Algorithms

Subject Co-ordinator - Prof. Palash Dey

Co-ordinating Institute - IIT Kharagpur

Sub-Titles - Available / Unavailable | MP3 Audio Lectures - Available / Unavailable

Lecture 1 - Amortized Complexity: What and Why ?
Lecture 2 - Aggregate Method and Its Use in Multi-Stack
Lecture 3 - Use of Aggregate Method in Amortized Analysis of Binary Counter, Accounting Method and its Applic
Lecture 4 - Potential Method and Its Use in the Amortized Analysis of Multi-stack and Binary Counter
Lecture 5 - Dynamic Table
Lecture 6 - Dynamic Table (Continued...)
Lecture 7 - Fibonacci Heap: Creation, Insertion
Lecture 8 - Fibonacci Heap: Extract Min
Lecture 9 - Fibonacci Heap: Pseudocode of Insertion, Extract Min
Lecture 10 - Fibonacci Heap: Decrease Key, Amortized Analysis of Insertion, Extract Min
Lecture 11 - Fibonacci Heap: Amortized Analysis of Decrease Key
Lecture 12 - Fibonacci Heap: Amortized Analysis (Continued...)
Lecture 13 - Fibonacci Heap: Amortized Analysis (Continued...), Introduction to Maximum Flow
Lecture 14 - Maximum Flow: Naive Greedy Approach
Lecture 15 - Maximum Flow: Residual Graph
Lecture 16 - Maximum Flow: Ford Fulkerson Method
Lecture 17 - Integrality of Maximum Flow
Lecture 18 - Maximum Flow, Layered Residual Graph
Lecture 19 - Maximum Flow, Edmond-Karp Algorithm
Lecture 20 - Maximum Flow, Dinic's Algorithm
Lecture 21 - Maximum Flow, Dinic's Algorithm (Continued...)
Lecture 22 - Dry Run of Ford-Fulkerson Method, Edmond-Karp Algorithm, and Dinic's Algorithm
Lecture 23 - Overview of Push Relabel Algorithm
Lecture 24 - Pseudocode and Dry Run of Push Relabel Algorithm
Lecture 25 - Invariants Maintained by Push Relabel Algorithm
Lecture 26 - Proof of Correctness of Push Relabel Algorithm: A Key Lemma
Lecture 27 - Proof of Correctness of Push Relabel Algorithm: Bounding Number of Relabel and Saturating Push O
Lecture 28 - Proof of Correctness of Push Relabel Algorithm: Bounding Number of Non-Saturating Push Operation
Lecture 29 - Generalization of Maximum Flow

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Lecture 30 - Generalization of Maximum Flow (Continued...) Max Flow Min Cut Theorem
Lecture 31 - Maximum Flow Minimum Cut (Continued...) Maximum Bipartite Matching
Lecture 32 - Maximum Bipartite Matching
Lecture 33 - Hall's Marriage Theorem
Lecture 34 - Flow Path Decomposition
Lecture 35 - Stable Matching
Lecture 36 - Gale Shapley Algorithm
Lecture 37 - Gale Shapley Algorithm (Continued...)
Lecture 38 - Maximum Flow Based Minimum Cut Algorithm
Lecture 39 - Karger's Minimum Cut Algorithm
Lecture 40 - Karger-Stein Algorithm
Lecture 41 - Karger-Stein Algorithm (Continued...)
Lecture 42 - Maximum Cut in General Graph
Lecture 43 - Edmond's Blossom Algorithm
Lecture 44 - Edmond's Blossom Algorithm (Continued...)
Lecture 45 - Edmond's Blossom Algorithm (Continued...)
Lecture 46 - Edmond's Blossom Algorithm (Continued...)
Lecture 47 - Edmond's Blossom Algorithm (Continued...)
Lecture 48 - Edmond's Blossom Algorithm (Continued...), Order Statistics
Lecture 49 - Order Statistics
Lecture 50 - Order Statistics (Continued...)
Lecture 51 - Linear Time Selection
Lecture 52 - Linear Time Selection (Continued...)
Lecture 53 - String Matching: KMP Algorithm
Lecture 54 - String Matching: KMP Algorithm (Continued...)
Lecture 55 - Introduction to NP
Lecture 56 - Self Reduction
Lecture 57 - NP Completeness
Lecture 58 - NP Completeness of 3 SAT
Lecture 59 - NP Completeness of Clique and Independent Set
Lecture 60 - NP Completeness of Vertex Cover and Subset Sum
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