NPTEL Video Course - Computer Science and Engineering - NOC:Linear Programming and its Applications to Comput

Subject Co-ordinator - Prof. Rajat Mittal

Co-ordinating Institute - IIT - Kanpur

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

Lecture 1 - Linear Programming, an Example
Lecture 2 - Introduction to Linear Programming
Lecture 3 - Gaussian Elimination with Examples
Lecture 4 - Summary of Gaussian Elimination
Lecture 5 - Vector Space over real numbers
Lecture 6 - Linear Operators
Lecture 7 - Solutions of Linear Equations
Lecture 8 - Resource Allocation as LP
Lecture 9 - Approximate Degree as LP
Lecture 10 - Equivalent LP's
Lecture 11 - Introduction to Convexity
Lecture 12 - Different Kind of Convex Sets
Lecture 13 - Feasible Region of LP
Lecture 14 - Proof of Weyl's Theorem
Lecture 15 - Definition of Convex Functions
Lecture 16 - Properties of Convex Functions and Examples
Lecture 17 - Basic Feasible Solution
Lecture 18 - BFS and Vertices
Lecture 19 - Simplex Algorithm
Lecture 20 - Details of Simplex Algorithm
Lecture 21 - Starting BFS
Lecture 22 - Degeneracy
Lecture 23 - Introduction to Duality
Lecture 24 - Hyperplane Separation Theorems
Lecture 25 - Farkas Lemma
Lecture 26 - How to take dual
Lecture 27 - Examples of taking dual
Lecture 28 - Strong Duality
Lecture 29 - Proof of Strong Duality

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Lecture 30 - Complementary Slackness
Lecture 31 - Introduction to Algorithmic Game Theory
Lecture 32 - Nash Equilibrium
Lecture 33 - Minimax and Nash Equilibrium
Lecture 34 - Deterministic Communication Complexity
Lecture 35 - Randomized Communication Complexity
Lecture 36 - Yao's Minimax Theorem
Lecture 37 - Lower bounds using Yao's Minimax
Lecture 38 - Set Disjointness Problem
Lecture 39 - LP for mass flow problem
Lecture 40 - LP for min cut problem
Lecture 41 - Max flow = Min cut
Lecture 42 - Primal dual approach
Lecture 43 - Primal dual for max flow
Lecture 44 - Set cover problem
Lecture 45 - Rounding for set cover
Lecture 46 - Analysis of Rounding
Lecture 47 - Algorithm for Set Cover
Lecture 48 - Linear Regression through LP
Lecture 49 - Linear Classifiers through LP
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