Combinatorial Optimization

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- 1. The Giles-Pulleyblank theorem. Use slides.
- 2. Problem 5 of Homework 2.
- 3. The Matroid example from Cormen.
- 4. List of topics that were covered:
 - (a) Linear Programming Fundamentals Finite systems of linear inequalities, Linear programming duality, Basic solutions and the Primal Simplex method, Tableau method, Totally Unimodular matrices, Graphs and Digraphs.
 - (b) Matroid Theory Independence axioms and examples of matroids, Circuit properties, Representations, The Greedy Algorithm.
 - (c) Shortest Paths Negative weight cycles, All-Pairs Minimum-weight Dipaths, Non-negative weights, No Dicycles and Knapsack programs.
 - (d) Maximum Flows Flow networks, Flow properties, cuts, The Ford-Fulkerson procedure, the Edmonds-Karp improvement, bipartite matching.
- 5. List of topics which were not covered:
 - (a) Linear Programming Sensitivity Analysis, Integer Programming.
 - (b) Matroid Rank proper- ties, Duality, Matroid Intersections.
 - (c) Polytope theory.