

Topics in TCS: Lecture Topics # 1

Instructor: Ankur Moitra

March 15, 2014

Here are the sources for the lectures we have already covered, but I am posting these online for your reference:

Linear Programming

- **The Birkhoff Polytope** (Allen, 2/23)
Source: Chapter II.5 in Barvinok
- **Application of Duality I: Min-Cut Max-Flow** (Jiaming, 2/23)
Source: <http://people.orie.cornell.edu/dpw/orie6300/Lectures/lec04.pdf>
- **Application of Duality II: Vertex Cover** (Bryan, 2/25)
- **Seidel's Algorithm** (Michael, 3/3)
Source: <http://www.cs.cmu.edu/~15451/lectures/lect1024.pdf>
- **Simplex Method I: Bases and Pivoting** (Lars, 3/3)
Source: Sections 6-7 in <http://www-math.mit.edu/~goemans/notes-lp.ps>
- **Simplex Method II: Pivoting Rules** (Tyler, 3/5)
Source: <http://people.orie.cornell.edu/dpw/orie6300/Lectures/lec13.pdf>
- **Spanning Tree Polytope** (Eben, 3/5)
Source: <http://people.orie.cornell.edu/dpw/orie6300/Recitations/rec09.pdf>
- **Matroids I: The Greedy Algorithm** (Ariel, 3/10)
Source: basic definitions in <http://theory.stanford.edu/~jvondrak/CS369P-files/lec7.pdf> and greedy algorithm in <http://theory.stanford.edu/~jvondrak/CS369P-files/lec8.pdf>

- **Matroids II: The Matroid Polytope** (Nicolas, 3/10)
Source: <http://theory.stanford.edu/~jvondrak/CS369P-files/lec9.pdf>
- **Kalai-Kleitman Diameter Bound** (Cesar, 3/12)
Source: <http://arxiv.org/abs/math/9204233>