Presentation 2. Due by April 12. Outline due by March 26.

You must present on one of the following options.

1) Parts 7 and 8 of the linear program you considered for presentation 1.

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a) Explain and use a greedy algorithm to solve your example problem.

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b) Explain and use facet inequalities and an LP solver to solve your example problem.

2) Another linear programming problem no one has presented on yet: repeat of presentation 1. (parts 2-5 only)

3) A polytope sequence for which the entire face poset structure is known (see list below).

	5

a) Describe the objects of the face poset. This means to define the combinatorial structures and their < relations—structures from column II below.

	5

b) Give an example Hasse diagram for small dimension (2 or 3). Alternatively draw a small dimension polytope with all its faces labeled by objects from column II. (Or a 3d facet if the smallest available dimension larger than 2 is 4.)

	5

c) Show the polytope sequence for small dimensions (up to 3). You must label the vertices of the polytope with their actual vertex values and their associated object. (dim 4 for Birkhoff)

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d) List some known facts about counting of faces.

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e) (Group work) Describe facet or face structures (self-similarity or skeleton lattice)

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f) (Groupwork) Describe another isomorphic poset structure, or a space tiling.

4) An algorithm for linear programming that we have not covered. (see list below).

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a) Describe the algorithm step by step.

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b) Give an example on a 2-dim LP that you make up (perform the alg on a polygon.

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c) (Groupwork) Give an example worked on a real-world problem (like STSP).

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Outline due by March 26: Give a brief, one sentence summary for the above chosen items.

You may include terms that you don't understand completely yet. Make sure you list which parts will be presented by which partner if you plan to work as a team. Also give two dates on which you would like to do your presentation. (Tues Thurs, between April 12 and 19).

30 points total, worth 15% of grade.

Many polytopes and problems are summarized, with sources, here:
http://www.math.uakron.edu/~sf34/hedra.htm (The Associahedra Encyclopedia)

I. Polytope	II. Poset (possibly alternate choices)
Acyclotope (cycle graph)	Acyclic orientations of cycle graph
Birkhoff polytope	Perfect matchings of complete bipartite graph
Composihedron	Painted trees with corrollas
Cubeahedron(edgeless graph)	Design tubings of edgeless graph
Cyclohedron	Tubings of cycle graph
Diagonal rectangulation polytope	Diagonal Rectangulations
Graph composihedron (cycle graph)	Marked tubings of cycle graph, with equivalence
Graph composihedron (edgeless graph)	Marked tubings of edgeless graph, with equivalence
Graph multiplihedron (cycle graph)	Marked tubings of cycle graph
Graph multiplihedron (edgeless graph)	Marked tubings of edgeless graph
Halohedron	Design tubings of cycle graph
Multiplihedron	Painted trees
Permutohedron/ permutahedron	Ordered partitions
Pterahedron	Tubings of fan graph
Stellohedron	Tubings of star graph
LP Algorithm	
Steepest-Edge simplex method	
Devex Simplex method	
Branch-and-bound method	
Interior point/ellipsoid	