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Test 1 topics

Only the D14 students need to know the proofs of the theorem marked with “(with proof)”. Students in both D13 and D14 sections are required to know and understand the statement of the theorems listed. You are also required to know how to solve the problems from the first three homework assignments. The best way to prepare is to review old homework and quizzes (you do not need to know the bonus question on the first quiz). You should also know the definitions and statement of theorems listed below. The theorems and proofs can be found on the website.

- (1) Definition: feasible solution
- (2) Definition: object function
- (3) Definition: optimal solution, optimum
- (4) Definition: basic feasible solution
- (5) Definition: degenerate basic feasible solution
- (6) Definition: relative cost of column j
- (7) Definition: Standard/Canonical/General form
- (8) Definition: lex positive, lex negative, lex zero
- (9) Converting between forms of linear program - slack variables and surplus variables
- (10) Solving a 2d LP graphically
- (11) Simplex method and two phase simplex method (see examples on website)
- (12) Lexicographic simplex - initialization of row to be lex positive and pivot rules
- (13) Bland’s rule
- (14) Fact that lexicographic simplex and Bland’s rule do not cycle
- (15) Proposition about the relationship between a feasible basis and a basic feasible solution (Proposition 2) (with proof)
- (16) Useful characterization of basic feasible solutions (Proposition 4) (with proof)
- (17) Lemma about the existence of a basic feasible solutions (Lemma 5)
- (18) Fundamental theorem (Theorem 6)
- (19) Proposition about the significance of the relative cost vector \bar{c}^T (Proposition 7) (with proof)
- (20) Theorem about the pre-multiplication matrix (Theorem 8)