

Wednesday 30<sup>th</sup> November, 2016 07:14

### Test 4 topics

The fourth test will focus on the material listed below, but some material from the first three tests may appear. You should know how to solve the problems on quiz 5, homework assignments 9, and part 1 of homework 10.

New topics that may appear on exam 4

- (1) Max-flow via revised simplex (Section 4.3)
- (2) Primal dual algorithm, Theorem 5.1 - with proof, Theorem 5.3 - with proof, Theorem 6.1 - with proof
- (3) Primal dual for shortest path (Section 5.4)
- (4) Primal dual for max flow - Ford-Fulkerson algorithm
- (5) Finding an  $f$ -augmenting  $(s, t)$ -path
- (6) Definition of an  $(s, t)$ -cut and the capacity of an  $(s, t)$ -cut (Definition 6.1)
- (7) Max flow LP and its Dual LP
- (8) Feasible solution to dual of max flow LP corresponding to an  $(s, t)$ -cut (Theorem 6.1) (with proof)
- (9) Finding a minimum  $(s, t)$ -cut in a network
- (10) Max flow equals min cut theorem (Theorem 6.2)

Older topic that may appear on Exam 4

- (1) lexicographic simplex
- (2) Shadow/marginal prices - (see the dual simplex presentation for a discussion of this topic - HW 6 #1 is also relevant).
- (3) zero-sum games, pure strategy, mixed strategy Alice, Bob,  $\beta(\mathbf{x})$ ,  $\alpha(\mathbf{y})$ , worst-case optimal strategy, value of game, linear program corresponding to a matrix game
- (4) Revised simplex and 2-phase revised simplex