

20 Oct 2014

Math 181

Review:

Exam 2 will cover Chapters 13 and 15 (Fair Division and Game Theory).

Chapter 15

Definitions: backward induction, dominant/dominated strategy, expected value, fair game, maximin/minimax, mixed/pure strategy Nash Equilibria, nonsymmetrical game, partial-conflict game, saddlepoint, total-conflict game, value, zero-sum game.

15.1: Compute minimax/maxmin/saddlepoint

15.2: Determining the value of a 2×2 game. This section's examples are zero-sum games and only list one value for each cell in the table. The algorithm you use here (assigning $p, 1 - p, q, 1 - q$) may be required later for finding mixed strategy Nash Equilibrium. Computing expected values.

15.3: Determine pure strategy Nash Equilibria. Be able to successively eliminate strictly dominated strategies.

15.4: Be able to use backward induction for turn-based games.

Chapter 13

Definitions: adjusted winner procedure, bottom-up strategy, Divide-and-choose, envy-free, equitable, Knaster inheritance procedure, Pareto-optimal, point ratio, preference lists, proportional, Selfridge-Conway procedure (3-person cake-division), Vickrey auction.

13.1: Perform the adjusted winner procedure.

13.2: Perform the Knaster inheritance procedure.

13.4: Perform the bottom-up strategy.

13.7: Determine the outcome of the Selfridge-Conway envy-free Procedure (for three players). For example, if I tell you that the third player takes the trimmed piece, who divides the trimmed piece and who gets which slice. Can you describe why player A does not envy players B or C? (Page 482, #38 is good practice)

13.8: The previous homework (page 568, #43) dealt with Vickrey auctions. This is a good connection between the two chapters being covered on the exam.

In any of of these fair-division procedures, carefully consider which properties (envy-free, Pareto-optimal, proportiona, equitable) each method guarantees.

Homework: Due Wednesday, Oct 22.

Pages 477–479, do exercises 2, 9, 13, and 20. (Spend the time necessary to really understand what #9 is asking.)