

§14.3: LP FORMULATION OF TWO-PERSON ZERO-SUM GAMES

- 1.] Consider the following two-person zero-sum game:

	B_1	B_2	B_3
A_1	5	50	50
A_2	1	1	.1
A_3	10	1	10

Verify that the strategies $(x_1, x_2, x_3) = (1/6, 0, 5/6)$ for A and $(y_1, y_2, y_3) = (49/54, 5/54, 0)$ for B are optimal, and determine the value of the game.

- 2.] Colonel Blotto's army is fighting for the control of two strategic locations. Blotto has two regiments and the enemy has three. A location will fall to the army with more regiments. Otherwise, the result of the battle is a draw. Formulate the problem as a two-person zero-sum game, and solve it in Excel. Which army will win the battle?

- 3.] In the two-player, two-finger Morra game, each player shows one or two fingers, and simultaneously guesses the number of fingers the opponent will show. The player making the correct guess wins an amount equal to the total number of fingers shown. Otherwise, the game is a draw. Set up the problem as a two-person zero-sum game. Formulate the problem for player A and player B , and verify that the B formulation is the dual problem to the A formulation. Solve them both in Excel.