

# UNIVERSITY OF CALIFORNIA, BERKELEY

## DEPARTMENT OF STATISTICS

### STAT-155: Game Theory

Fall 2013

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Assignment # 7

**Date Given: October 28, 2013 (Monday)**  
**Date Due: November 04, 2013 (Monday)**

**Total Points: 20**

1. Consider a finite two-person zero-sum game with a payoff matrix  $A$  which is a square matrix of order  $n \times n$ . Further assume that the row sums and column sums are all equal and equal to  $c$ . Then find the value of the game and a pair of optimal strategies for the two players.
2. Consider a finite two-person zero-sum game with a payoff matrix  $A$  given by

$$\begin{pmatrix} d_1 & 0 & \cdots & 0 \\ 0 & d_2 & \cdots & 0 \\ \vdots & \vdots & \ddots & \vdots \\ 0 & 0 & \cdots & d_n \end{pmatrix}$$

- (a) Suppose  $d_i > 0$  for all  $1 \leq i \leq k$  and  $d_i < 0$  for all  $k + 1 \leq i \leq n$  where  $1 \leq k \leq n - 1$ . Then find the value of the game and a pair of optimal strategies for the two players.
- (b) Suppose  $d_k = 0$  and  $d_i > 0$  for  $i \neq k$  where  $1 \leq k \leq n$ . Then find the value of the game and a pair of optimal strategies for the two players.