UNIVERSITY OF CALIFORNIA, BERKELEY

DEPARTMENT OF STATISTICS

STAT-155: Game Theory

Fall 2013

Instructor: Antar Bandyopadhyay

GSI: Sujayam Saha

Assignment # 9

Date Given: November 11, 2013 (Monday) **Total Points: 20**
Date Due: November 18, 2013 (Monday)

1. Consider a two-person zero-sum game with the following payoff matrix

$$\begin{pmatrix} 0 & 1 & 2 \\ -3 & 0 & 3 \\ 2 & 1 & 0 \end{pmatrix}$$

Apply the *pivot method* and find the value of the game and a pair of optimal strategies for the two players. Write all details of each of the steps of the algorithm.

2. Consider the following *linear programing* problem:

$$\text{maximize} \quad 2z_1 + z_2 + 3z_3$$

subject to the constrains

$$\begin{array}{rcrcl} 2z_1 & + & z_2 & \leq & 2 \\ 2z_1 & + & 3z_3 & \leq & 2 \\ z_2 & + & 3z_3 & \leq & 2 \end{array}$$

and $z_1 \geq 0$, $z_2 \geq 0$ and $z_3 \geq 0$.

(a) Formulate this problem as a two-person zero-sum game and give the payoff matrix.

(b) Find the value and a pair of optimal strategies for this game.

(c) Find the solution to the above linear programing problem with optimal values for z_1, z_2 and z_3.