UNIVERSITY OF CALIFORNIA, BERKELEY

DEPARTMENT OF STATISTICS

STAT-155: Game Theory

Fall 2013

Instructor: Antar Bandyopadhyay

GSI: Sujayam Saha

Assignment # 6

Date Given: October 14, 2013 (Monday)   Total Points: 20
Date Due: October 21, 2013 (Monday)

1. Let (X, Y, A) be a finite two-person zero-sum game with pay-off matrix $A = ((a_{ij}))_{\substack{1 \leq i \leq m \\ 1 \leq j \leq n}}$. Let V be the *value of the game*. Then show that

$$\max_{1 \leq i \leq m} \min_{1 \leq j \leq n} a_{ij} \leq V \leq \min_{1 \leq j \leq n} \max_{1 \leq i \leq m} a_{ij}.$$

2. Suppose two players I and II call two numbers simultaneously from the set $\{1, 2\}$. If the numbers Player I and II call are a and b respectively then Player I receives an amount of \$$ab$ from Player II if $a + b$ is *odd*, otherwise Player I pays to Player II an amount of \$$ab$.

   Find the pay-off matrix for this game. What are the *optimal strategies* for Players I & II? What is the *value of the game*?