Assignment on Bargaining Problems

Barg1

Solve the following TU games. Find the Cooperative Strategy, TU Cooperative Value, Optimal Threat, Disagreement Point, Side Payment.

$\begin{bmatrix} 3,2 & 5,1 \\ 0,0 & 1,4 \end{bmatrix}, \quad \begin{bmatrix} 7,4 & 2,8 \\ 4,5 & 5,6 \end{bmatrix}$

Barg2

Let A be an nxn matrix. Consider the symmetric bimatrix $[A, A^T]$. Show that the the payoff to Player I and Player II are equal in the TU Cooperative Value.

Barg3

Solve the following Nash Bargaining problems.

(i) $\begin{pmatrix} 5,1 & 7,4 & 1,10 \\ 1,1 & 9,\text{-}2 & 5,1 \end{pmatrix}, \quad \mathrm{SQ} = (\text{security level of I}, \text{security level of II})$

(ii) $\begin{pmatrix} 1,0 & -1,1 & 0,0 \\ 3,3 & -2,9 & 3,7 \end{pmatrix}, \quad \mathrm{SQ} = (-1,1)$

Barg4

Let $S=\{(x, y): 0 \leq y \leq 4 - x^2\}$ be the NTU-feasible set.

Find the Nash Bargaining Solution if the status quo point is (0, 0)

Barg5.

Show that the Axiom of Invariance Under Change of Location and Scale is valid for the bargaining solution obtained from the Zeuthen's Principle.

Barg6. (Finite Horizon Bilateral Bargaining)

Two players, I and II bargain on how to split v dollars. The rules are as follows. The game begins in

period 1 and player I makes an offer of a split to player II. A split is any real number between (0, v). Player II can then accept or reject the split. If she accepts, then the game ends. If she rejects it then the game continues to another round where player II gets to make an offer of a split which player I can either accept or reject. If no agreement is reached in T periods, then both players get 0. Additionally, there is a discount factor $\delta \in (0, 1)$ so that a dollar received in period t is worth δ^{t-1} dollars in period 1 dollars.

Suppose T=3. Use the method of backward induction to find the subgame perfect solution to the bargaining problem in the above.