

UGEB2530 Game and strategic thinking
Assignment 5

Due: 23 March 2015 (Monday)

1. Find the threat solutions, that is find the threat strategy and the payoff of each player, of the games with the following bimatrices.

(a) $\begin{pmatrix} (3, -2) & (2, 4) \\ (1, 0) & (3, -1) \end{pmatrix}$

(b) $\begin{pmatrix} (5, 3) & (1, 3) \\ (4, 4) & (2, 1) \end{pmatrix}$

2. John and Peter want to go home from their working place by taxi. If they hire taxi separately, the costs for John and Peter are \$50 and \$80 respectively. If they hire a taxi together, the cost will be \$100. By considering Shapley's values, find a suitable way for John and Peter to divide the cost if they hire a taxi together.
3. Three towns A, B, C are considering whether to built a joint water distribution system. The costs of the construction works are listed in the following table

Coalition	Cost(in million dollars)
$\{A\}$	11
$\{B\}$	7
$\{C\}$	8
$\{A, B\}$	15
$\{A, C\}$	14
$\{B, C\}$	13
$\{A, B, C\}$	20

- (a) Find $\nu(S)$ for each coalition S where ν is the characteristic function.
- (b) Find the Shapley's value of A, B, C .
- (c) How should the three towns divide the construction cost?