

HW 3. Games

Due day Wednesday, February 12, 2014

1. Graphically solve (find the optimal strategies for both players) the two person zero sum games with the following payoff matrices

$$1.1. \quad \begin{pmatrix} 1 & -2 \\ -2 & 3 \end{pmatrix} \quad (1)$$

$$1.2. \quad \begin{pmatrix} 1 & 2 \\ 2 & 3 \end{pmatrix} \quad (2)$$

$$1.3. \quad \begin{pmatrix} 0 & 1 & -1 \\ 1 & -1 & 2 \end{pmatrix} \quad (3)$$

2. Consider a cooperative game for four players. Each player owns gloves, three players own two right gloves each, the fourth one owns three left gloves. A coalition shares their gloves. A coalition wins 10 points for each pair (right and left ones) of the gloves they own. Compute Shapley value for each player.

3. Three people: a builder B, and architect A and an interior designer D cooperate to build and sell a house. Their expected profit of cooperation is as follows:

$$\begin{aligned} B &= 400 & A &= 50 & D &= 50 \\ BA &= 700 & BD &= 600 & AD &= 100 \\ BAD &= 1000 \end{aligned}$$

Compute Shapley value for each player and help the players to spread the profit.