

TEK5010 Multiagent systems

Lecture 10: Cooperative game theory

Exercise: Cooperative games 1

Question 1

A cooperative game is described by the following marginal contribution net:

$$a \wedge b \rightarrow 7$$

$$b \rightarrow 4$$

$$c \rightarrow 6$$

$$b \wedge c \rightarrow 3$$

Let v be the characteristic function defined by these rules.

a) Calculate the values of the following coalitions:

$$v(\emptyset)$$

$$v(\{a\}), v(\{b\}), v(\{c\})$$

$$v(\{a, b\}), v(\{a, c\}), v(\{b, c\})$$

$$v(\{a, b, c\})$$

b) Draw the weighted graph representing this game.

c) Is this game stable?

d) Calculate the Shapley value for each player in this game.