

Ex.1

Consider a TU-game  $(\{1,2,3,4\}, w)$  such that  $w(S)=0$  is  $S \in \{\{1\}, \{4\}, \{1,4\}\}$ ;  $w(S)=1$  for each other non empty coalition  $S$ . Calculate the Shapley value of  $w$  (without using the formula!) and say whether the Shapley value is in the core of the game  $w$ .

EX.2

Consider a TU-game  $(N, v)$  such that  $v(S)=f(s)$  for each  $S \in 2^N \setminus \{\emptyset\}$  where  $s$  is the cardinality of  $S$  and  $f(s)$  is a real-valued function. 1) Is  $v$  a superadditive game? 2) The Shapley value of  $v$  gives  $f(n)/n$  to each player in  $N$ ? 3) Find conditions on  $f$  such that the core of  $v$  is non-empty.

Ex.3

Find the Nash and Kalai-Smorodinsky solution for the following bargaining games (in both cases the disagreement point is  $(0,0)$ ). What can you say if the disagreement point was  $(1,1)$ ?

