Algorithmic Game Theory

Algorithmische Spieltheorie

Pingo

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Website

https://pingo.coactum.de/

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Question 1

Let $G = (P, v)$ be a nonmonotonic cooperative game with n players. Consider the payoff vector $(\varphi_1(G), \dots, \varphi_n(G))$. Which of the following statements are true?

A $\sum_{i=1}^{n} \varphi_i(G) = v(P)$.

B If $\varphi_i(G) = 0$ then $i \in P$ is a dummy player.

C $\varphi_i(G) = \varphi_j(G)$ for symmetric players i and j.

D $\varphi_i(G + G) = 2\varphi_i(G)$.

Question 2

Does adding players to a weighted voting game necessarily decrease the power (in terms of their Shapley–Shubik index) of the originally existing players?

A Yes.

B No.

Question 3

Suppose a player in a weighted voting game splits into several identities (“false-name manipulation”). Is it possible that these new players together have a total power (in terms of the sum of their Shapley–Shubik indices) that is higher than the original player’s power?

A Yes.

B No.

Question 4

Suppose a player in a weighted voting game splits into several identities ("false-name manipulation"). Is it possible that these new players together have a total power (in terms of the sum of their Shapley–Shubik indices) that is lower than the original player's power?

A Yes.

B No.

Question 5

Consider the weighted voting game $G = (4, 4, 1, 1; q)$.
How would you choose the quota q to make sure that each of the weight-1 players has the same total power (in terms of the Shapley–Shubik index) as any of the weight-4 players?

A $q = 5$.

B $q = 8$.

C $q = 10$.