Algorithmic Game Theory

Algorithmische Spieltheorie

Pingo

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Website

https://pingo.coactum.de/

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Question 1

Consider the game $G = (P, v)$ with three players whose characteristic function is defined by

$$v(C) = \begin{cases} 1 & \text{if } \|C\| \text{ is odd} \\ 0 & \text{if } \|C\| \text{ is even.} \end{cases}$$

Which of the following statements are true?

A G is anonymous.

B G is simple.

C G is superadditive.

D G is convex.

Question 2

Consider again the nonmonotonic game $G = (P, v)$ with three players whose characteristic function is defined by

$$v(C) = \begin{cases} 1 & \text{if } \|C\| \text{ is odd} \\ 0 & \text{if } \|C\| \text{ is even.} \end{cases}$$

Can G be represented by a weighted voting game if we allow also negative weights?

A Yes

B No

Question 3

Consider the game $G = (P, v)$ with four players whose characteristic function is defined by

$$v(C) = \begin{cases} 1 & \text{if } \|C\| \geq 2 \\ 0 & \text{if } \|C\| \text{ otherwise.} \end{cases}$$

Which of the following statements are true?

A G is anonymous.

B G is simple.

C G is superadditive.

D G is convex.

Question 4

Consider again the game $G = (P, v)$ with four players whose characteristic function is defined by

$$v(C) = \begin{cases} 1 & \text{if } \|C\| \geq 2 \\ 0 & \text{if } \|C\| \text{ otherwise.} \end{cases}$$

Which of the following statements are true?

A G has one veto player.

B G has two veto players.

C G has three veto players.

D G has four veto players.

Question 5

Which of the following statements are true for simple games?

A If i is a veto player, then i is contained in all winning coalitions.

B There always exists a veto player.

C Veto players are unique.

D It is possible that all players are veto players.

E A superadditive simple game has an empty core exactly if it has a veto player.

Question 6

Consider the weighted voting game $G = (50, 98, 2, 48; 100)$.

Which of the following weighted voting games are equivalent to G?

A $(1, 1, 1, 1; 4)$

B $(1, 2, 1, 1; 4)$

C $(1, 2, 1, 1; 3)$

D $(1, 2, 2, 1; 3)$

Question 7

Consider the weighted voting game $G = (50, 98, 2, 48; 100)$.

Which (if any) of the following players is a veto player?

A 1

B 2

C 3

D 4