

Algorithmic Game Theory

Algorithmische Spieltheorie

Pingo

Wintersemester 2022/2023

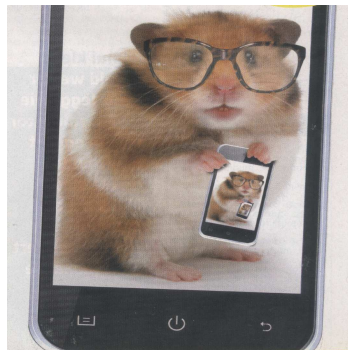
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Website

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Question 1

| | | Belle | |
|------|----------|----------|----------|
| | | Shopping | Stopping |
| Anna | Shopping | (7, 3) | (2, 4) |
| | Stopping | (4, 2) | (1, 1) |

- A There is a strict Nash equilibrium in pure strategies.
- B There are exactly two Nash equilibria in pure strategies.
- C There are exactly three Nash equilibria in pure strategies.
- D There are exactly four Nash equilibria in pure strategies.

Question 2

| | | Belle | |
|------|----------|----------|----------|
| | | Shopping | Stopping |
| Anna | Shopping | (7, 3) | (2, 4) |
| | Stopping | (4, 2) | (1, 1) |

- A Anna has a dominant strategy.
- B Belle has a dominant strategy.
- C Anna has a strictly dominant strategy.
- D Belle has a strictly dominant strategy.

Question 3

| | | Belle | |
|------|----------|----------|----------|
| | | Shopping | Stopping |
| Anna | Shopping | (7, 3) | (2, 4) |
| | Stopping | (4, 2) | (1, 1) |

- A Exactly one strategy profile is Pareto-optimal.
- B Exactly two strategy profiles are Pareto-optimal.
- C Exactly three strategy profiles are Pareto-optimal.
- D All four strategy profiles are Pareto-optimal.

Question 4

Which of the following claims are true?

- A Every strict Nash equilibrium in pure strategies is a profile of strictly dominant strategies.
- B Every profile of strictly dominant strategies is a strict Nash equilibrium in pure strategies.
- C Every Pareto-optimal profile contains only dominant strategies.
- D There is a two-player normalform game with two strategies per player that has a strict Nash equilibrium in pure strategies but no dominant strategies.

Question 5

| | | Belle | |
|------|---|----------------|----------|
| | | C | S |
| Anna | C | $(-100, -100)$ | $(1, 0)$ |
| | S | $(0, 1)$ | $(0, 0)$ |

This reminds me of ...

- A ... the prisoners' dilemma.
- B ... the battle of the sexes.
- C ... the chicken game.
- D ... the penalty game.

Question 6

| | | Belle | |
|------|----------|----------------|----------|
| | | Crossing | Stopping |
| Anna | Crossing | $(-100, -100)$ | $(1, 0)$ |
| | Stopping | $(0, 1)$ | $(0, 0)$ |

- A There is a strict Nash equilibrium in pure strategies.
- B There are exactly two Nash equilibria in pure strategies.
- C There are exactly three Nash equilibria in pure strategies.
- D There are exactly four Nash equilibria in pure strategies.

Question 7

| | | Belle | |
|------|-------|----------------------------|----------------------------|
| | | Cross | Stop |
| Anna | Cross | $(-100, -100)$ | $(\mathbf{1}, \mathbf{0})$ |
| | Stop | $(\mathbf{0}, \mathbf{1})$ | $(0, 0)$ |

Which of the following claims are true?

In addition to the two Nash equilibria in pure strategies, ...

- A ... there is no Nash equilibrium in mixed strategies.
- B ... there is exactly one Nash equilibrium in mixed strategies.
- C ... there are exactly two Nash equilibria in mixed strategies.
- D ... there are exactly four Nash equilibria in mixed strategies.

Question 8

Which of the following walks are correct according to the proof of Sperner's lemma?

- A
- B
- C
- D
- E
- F

