Preference Aggregation by Voting: Algorithmics and Complexity

Präferenzaggregation durch Wählen: Algorithmik und Komplexität

Pingo

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Website

https://pingo.coactum.de/

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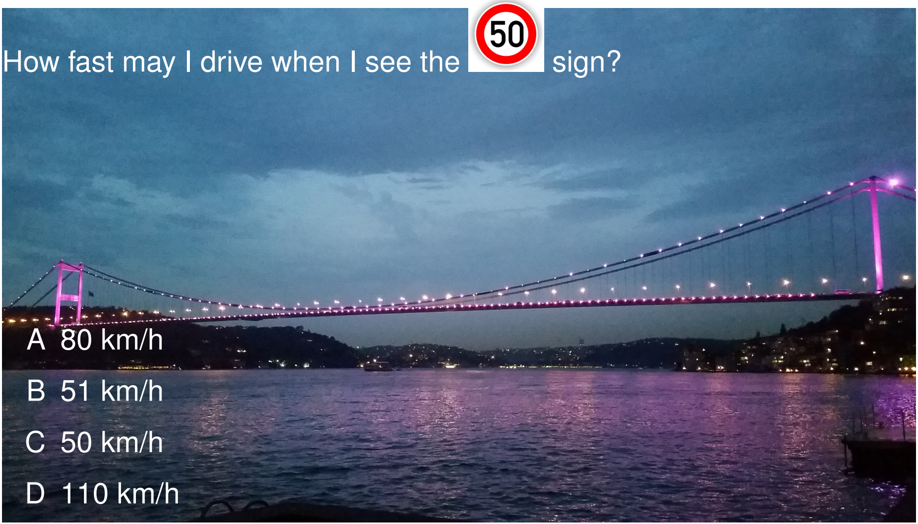
Question 1



How fast may I drive when I see the 50 sign?

A 80 km/h

B 51 km/h

C 50 km/h

D 110 km/h

Question 2

Let $(\{a, b, c, d, e, f\}, \{\{a, c, d\}, \{a, b, e\}, \{a, c, f\}, \{b, e, f\}, \{b, d, f\}\})$ be a given instance of EXACT COVER BY THREE-SETS.

A It is a yes-instance because of the exact cover $\{\{a, c, f\}, \{b, d, f\}\}$

B It is a yes-instance because of the exact cover $\{\{a, c, d\}, \{b, e, f\}\}$

C It is a yes-instance because of the exact cover $\{\{a, b, e\}, \{a, c, f\}, \{b, e, f\}\}$

D It is a no-instance

Question 3

Anna:	a	b	c	d
Belle:	b	a	d	c
Chris:	c	d	a	b
David:	d	a	b	c
Edgar:	d	b	c	a

Who wins this STV election under lexicographic tie-breaking ($a > b > c > d$)?

A a

B b

C c

D d

Question 4

Anna:	a	b	c	d
Belle:	b	a	d	c
Chris:	c	b	a	d
David:	d	a	b	c
Edgar:	d	b	c	a

For which two tie-breaking orders does b win this STV election?

A $a > c > b > d$

B $c > a > d > b$

C $a > d > b > c$

D $d > c > b > a$

Question 5

Which two of the following reductions are true for each voting system $\mathcal{E}$ and assuming $\mathrm{P} \neq \mathrm{NP}$?

A $\mathcal{E}$-CM $\leq_{\mathrm{m}}^{\mathrm{p}}$ $\mathcal{E}$-CCM

B $\mathcal{E}$-DCM $\leq_{\mathrm{m}}^{\mathrm{p}}$ $\mathcal{E}$-DM

C $\mathcal{E}$-CCM $\leq_{\mathrm{m}}^{\mathrm{p}}$ $\mathcal{E}$-CCWM

D $\mathcal{E}$-CCWM $\leq_{\mathrm{m}}^{\mathrm{p}}$ $\mathcal{E}$-DCWM

Question 6

Anna, Belle, Chris:	c	a	b	d
David, Edgar:	a	d	b	c
Felix, George:	b	d	a	c

Is it possible to partition $C = \{a, b, c, d\}$ into C_1 and C_2 such that when the plurality winners of (C_1, V) and (C_2, V) run against each other, a is the unique plurality winner?

A Yes, with $C_1 = \{a, b, c\}$ and $C_2 = \{d\}$

B No

C Yes, with $C_1 = \{a, c\}$ and $C_2 = \{b, d\}$

D Yes, with $C_1 = \{a, d\}$ and $C_2 = \{b, c\}$

Question 7

Anna, Belle, Chris:	c	a	b	d
David, Edgar:	a	d	b	c
Felix, George:	b	d	a	c

Is it possible to partition $C = \{a, b, c, d\}$ into C_1 and C_2 such that when the veto winners of (C_1, V) and (C_2, V) run against each other, a is the unique veto winner?

A Yes, with $C_1 = \{a, b, c\}$ and $C_2 = \{d\}$

B No

C Yes, with $C_1 = \{a, c\}$ and $C_2 = \{b, d\}$

D Yes, with $C_1 = \{a, d\}$ and $C_2 = \{b, c\}$