<Discrete Mathematics>

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작성일_06_14

a closed semiring (S, +, •, 0, 1)

1. monoid (S, +, 0), (S, •, 1)

-> closed, identity, associative

2.

a quine: a program which copys itself

recursion theorem:

1. r(w) = t(<R>, w)

T is a computer program, t is a computable function t:$\Sigma^* \times \Sigma^* \rightarrow \Sigma^*$

a computable function r: $\Sigma^* \rightarrow \Sigma^*$

2. $E_i = E_{f(i)}$

다익스트라

(S, +, •, 0, 1)

S = $R^+ \cup \infty$

+ = min

• = +

0 = ∞

1 = 0

partial order?

1. reflexive
2. anti-symmetric
3. transitive

a binary relation R

A = {1, 2, 3}

R = {(1, 2), (2, 1), (1, 1), (2, 2), (3, 3)} -> not partial order

R = {(1, 2), (1, 1), (2, 2), (3, 3)} -> partial order

anti-symmetric?

~(if aRb then bRa)

≡ if aRb then no bRa

fixed point ≡ f(x)=x

NPC의 정의

1.

(a) a set of decision problems x is in NP

(b) All problems in NP are efficiently reducible to x

2.

If any problem in NPC is solvable efficiently

Then P=NP

a $\in$ NP

b $\in$ P

c $\in$ NPC

relative hardness

a $\geq$ b

a $\leq$ c

b $\leq$ c

P = {x|__________}

1. x is a decision problem
2. x is efficiently solvable

NP = {x|_________}

1. x is a decision problem
2. $\forall_{yes-\in stance a} \exists_{certificate b}$ Verification (a, b) is done efficiently

yes-instance, <G, k> for k-clique problem