

4/30 (Fri) Graphs

p.o. set

Ex 1.) (\mathbb{Z}, \leq)

$\text{lub}(3,5) = 5$ --- max

$\text{glb}(3,5) = 3$ --- min



ub
 $u \geq a \wedge u \geq b$
 lub

$A \cup B = \{a \mid a \in A \vee a \in B\}$

$= \{c \mid a \leq c \wedge b \leq c\}$

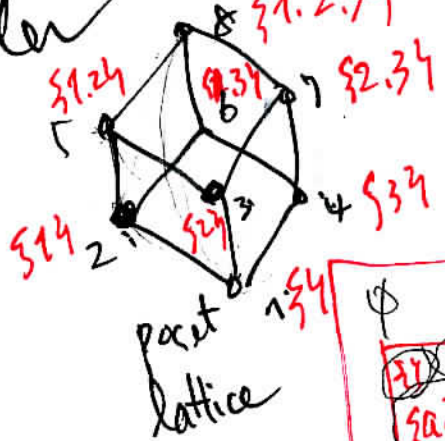
$\text{lub}(N,1) = \text{LCM}(\text{prime factors})$
 $\text{glb}(N,1) = \text{GCD}(\text{prime factors})$

Quiz!!!

Define $A \cup B$ in this aspect of least upper bound in (U, \leq) when U is a collection of all sets.

for example Tree is ~~X~~ - property
 and otherwise ~~X~~ \rightarrow X - characteristic
 // definition

partial order \rightarrow total order



$5 <_t 6$
 but $5 \not<_p 6$

but if $2 >_p 1$ then $2 >_t 1$

$2 \not>_p 3$ $3 >_t 2$
 2 3

part lattice



Let $A, B \in U$ $A \approx B$ if

We say

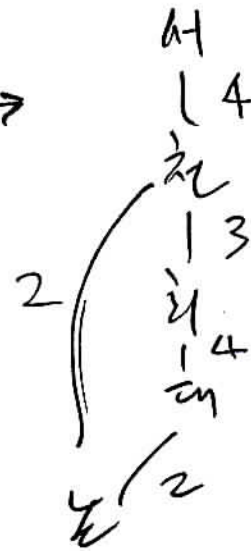
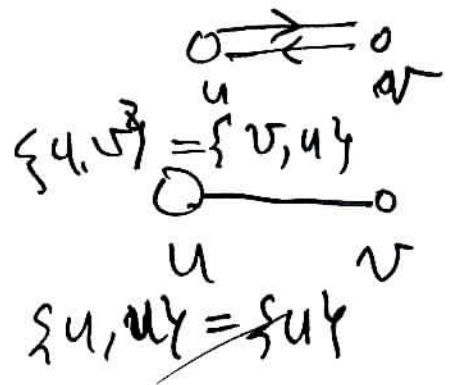
$\exists f: \text{bijection } A \rightarrow B$

$\subseteq U \times U$ \approx is equivalent!
 partition on U



$(u, v) \in E$ where $E \subseteq V \times V$
 ↳ digraph $(u, v) \neq (v, u)$

$\{u, v\} \in E$
 ↳ ugraph



$f: E \rightarrow \mathbb{N}$
 $f\{\text{시작}, 1\} = 4$
 $f\{1, 2\} = 2$

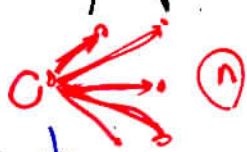
directed graph
 ugraph
 undirected graph

$(a, b) \in A \times A = E$ (Edge) $|V|^2$ edges

$\{a, b\} \in \text{Edge}$ where $a, b \in A$.

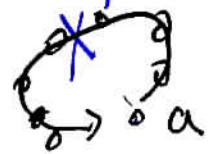
$$n + (n-1) + \dots + (1) = \frac{n(n+1)}{2}$$

$$= \frac{|V|(|V|+1)}{2} \text{ edges}$$



digraph

ugraph may be considered as a special case of a digraph.



Def 2.1 $a_0 \dots a_n$



$(n+1)$ vertices
 n - edges

$n \geq 1$

$a_0 = a_1 = a$ (a)

$a \in E^*$... path of length ≥ 0
 $a \in E^* b$... " " > 0

$G = (V, E)$
 $G^+ = (V, E^+)$
 $G^* = (V, E^*)$