19th September 2022 (Monday)

Scribed Notes – Lecture 16

Student ID :-

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Power set of Partial Order :-

This elements of set is a subset of another set. Partial Ordered Set (POSET) consists of sets with three binary relations as follows.

- **Reflexive Relation –**One in which every element maps to itself.
- **Anti-Symmetric Relation –**If (a, b) ∈ R and (b, a) ∈ R, then a=b.
- **Transitive Relation –**If (a, b) ∈ R and (b, c) ∈ R then (a, c) ∈ R).

Isomorphic Ordered Set :-

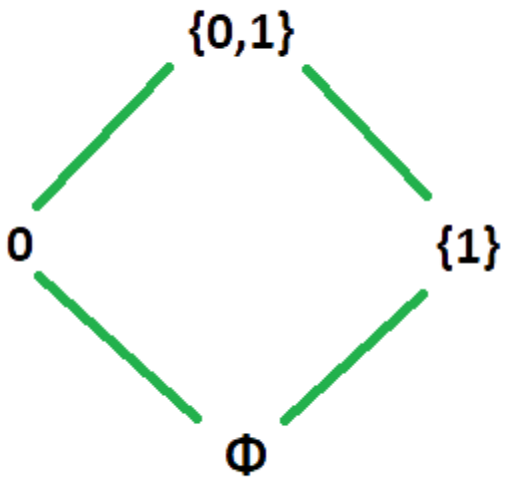
Let (A,<=) and (B,<=) be two partially ordered sets then they are said to be isomorphic if their “Structures” are entirely similar.

Example :-

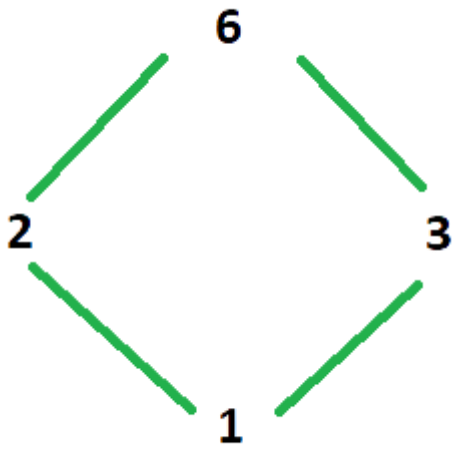
Let two POSETS, A = P({0, 1}) ordered by ≤ and B = {1, 2, 3, 6} ordered by division relation are Isomorphic Ordered Sets.

Hasse Diagram of POSET A :-

→A = { Φ, {0}, {1}, {0, 1} } with subset relation.



Hasse Diagram of POSET B :-



Hyper Cubes :-

→ Direct definition of hyper cubes H_K.

→K in {0,….}

→Hyper cubes has no end bound still it is finite.

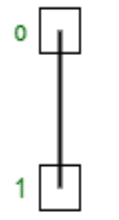
→V = { all bit strings of length K }

→Every String is subset and all possible subset is 0 and 1.

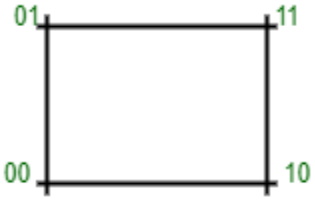
→E = { (u,v) | s(u), s(v) differ in exactly one position }

→Hyper cube H_K is the hasse diagram of the power set partial order of a k element set.

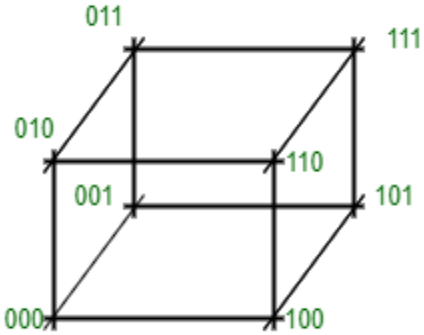
→Each node is assigned a binary address in such a manner, that the addresses of two neighbours differ in exactly one bit position. For example, the three neighbours of the node with address 100 are 000, 110, and 101 in a three-cube structure. Each of these binary numbers differs from address 100 by one bit value.



One-cube



Two-cube



Three-cube

→Indirect Definition Hyper cube

→H_K H_{q+1} is two copies of H_q. (Original = 0 and Duplicate = 1)

Example of Q(1) :-

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0 1

Steps :-

1. Lefthand side Original and righthand size Duplicate
2. Join the same label
3. And 0 before original label and add 1 before duplicate label