Compiler Optimizations and Program Analysis

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Outline

Recap

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- The ideal value was not obtained. Values obtained were *over approximated*.
- Values obtained also depends on lattice taken for analysis.

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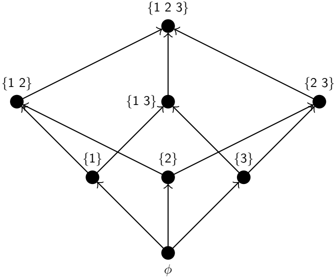

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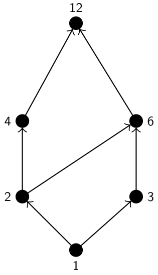
Divisors of 12= {1,2,3,4,6,12} and relation=divides

- $(a \rightarrow b) \Rightarrow$ (b÷ a) ==0.
- Hasse Diagram shown below.



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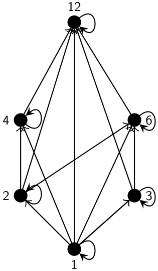
  - antisymmetric: $x \leq y$ and $y \leq x \Rightarrow x{=}{=}y, \forall\, x, y \in S$.

Transitive - S= divisors of 12 and binary relation $\leq$ = divides



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  - Similarly, $v = \sqcap X$ is the **greatest lower bound** or **glb** or **meet** of X .

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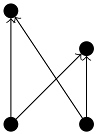
- A **complete lattice** is a lattice in which every subset of elements has a **lub** and **glb**.
- What is *semilattice*?. Read Dragon Book, covered in the previous class.

The below relation is Lattice, POSET, both or None?



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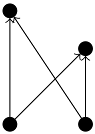

- It is `POSET`, not a `lattice`.

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- The LLVM IR pass discussed in one of the previous class is added in course repository.