

# CSI 35 LECTURE NOTES (Ojakian)

## Topic 8: Posets

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### OUTLINE

(References: Wells 51 - 53, 55 - 59, 117, 129, 130, 132 - 137; Rosen: 9.6)

#### 1. Posets

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##### 1. Poset Definition

- (a) Example: Consider the set of subsets of  $\{1, 2, 3\}$  ordered by inclusion. Draw a Hasse Diagram. In general can do for any  $[n]$ .
- (b) DEF: A partially ordered set ("poset") is a binary relation which is 1) Reflexive, 2) Antisymmetric, and 3) Transitive

##### 2. Poset Terminology

- (a) Maximum element (aka Greatest element) versus Maximal element
- (b) Minimum element (aka Least element) versus Minimal element
  - i. Example 15.
- (c) Lower and Upper Bound on a set
  - i. Example 18 (from Hasse diagram)
- (d) Greatest Lower Bound and Least Upper Bound
  - i. Example 20: Divisibility poset

##### 3. Exercises

- (a) On definition and Hasse Diagrams  
Section 9.6: 1 - 11, 20 - 23, 25 - 27.
- (b) On other terminology  
Section 9.6: 32 - 36