

CAS 701 Fall 2004

10 A Compendium of Mathematical Structures

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Single Binary Relation

- Equivalence relation
- Reflexive, transitive relation (preorder)
- Orders (strict and nonstrict)
 - Partial order
 - Linear order
 - Well order

Algebraic Structures

- Group-like structures
- Ring-like structures
- Modules
- Lattices

Group-Like Structures

- Magma or groupoid
- Semigroup
- Monoid
- Group
- Abelian (commutative) group

Ring-Like Structures

- Semiring
- Ring
- Unit ring
- Field
- Ordered field
- Complete ordered field (field of real numbers)
- Kleene algebra

Modules

- Module
- Vector space
- Algebra

Lattices

- Semilattice
- Lattice
- Boolean algebra

Graphs

- Graph (undirected)
- Directed graph
- Multigraph
- Bipartite graph
- Directed acyclic graph
- Tree

List-Like Data Structures

- List
- Stream
- Array
- Record
- Stack
- Queue