

CSE 191

Introduction to Discrete Structures

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Midterm Review

Announcements

- Midterm is Wednesday 3/8/23 during class
 - 50 minutes to complete
 - Equivalence laws and inference rules will be provided
 - You may bring your own cheatsheet – One 8.5x11 sheet, front and back
 - Covers up to basic set operations (cartesian product/powerset excluded)

Topics Covered

1. Propositional Logic
2. Logical Equivalence
3. Predicates and Quantifiers
4. Logical Reasoning and Proofs
5. Sets

Propositional Logic

- **Subtopics:** Propositions, Logical Operators, Truth Tables
- **What you should know/be able to do:**
 - Understand what is and is not a proposition
 - Be able to determine the truth value of a proposition
 - Be able to construct truth tables for compound propositions
 - Be able to translate from symbolic representation to English
 - Be able to translate from English to symbolic representation

Logical Equivalence

- **Subtopics:** Laws of Equivalence, Proofs of Logical Equivalence
- **What you should know/be able to do:**
 - Understand what it means to be a tautology/contradiction
 - Understand what it means to be logically equivalent
 - Be able to show logical equivalence with truth tables
 - Understand how to apply logical equivalence laws to a proposition
 - Understand how to prove logical equivalence of two propositions

Predicates and Quantifiers

- **Subtopics:** Predicate Logic, Quantifiers
- **What you should know/be able to do:**
 - Understand what a predicate is
 - Understand when a predicate is also a proposition
 - Understand what quantifiers are
 - Be able to translate from symbolic form to English and vice versa
 - Understand how variable binding works
 - Understand quantifier negation

Logical Reasoning and Proofs

- **Subtopics:** Arguments, Inference Rules, Proof Methods
- **What you should know/be able to do:**
 - Understand what an argument is
 - Know what it means for an argument to be valid/invalid
 - Be able to construct logical reasoning proofs to show argument validity
 - Understand the basic mathematical proof methods discussed in class
 - Be able to construct a proof of a given statement using a specific method

Sets

- **Subtopics:** None
- **What you should know/be able to do:**
 - Understand the basics of what a set is
 - Be able to describe a set using roster notation and set builder notation
 - Understand what it means to be an element of a set
 - Understand what it means to be a subset of a set
 - Understand what it means for sets to be equal (and how to show it)
 - Understand the different set operations and be able to apply them