Final Overview

Basic Information

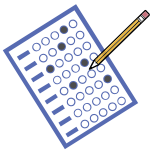
1

Final Information

- 2 Hours
- 300 points
- No notes allowed
- Exams will be taken on Canvas

2

What Will Be Covered



- Exam will cover the entire semester
- No question will be asked that is not in the lecture notes
- Download from: *athena.csus.edu/~cookd/28*

3

Final Format

- Available for 2 hours during our Final Time
- If the question has you fill in an answer – use lowercase (they are case sensitive)
- Bring scratch paper! **You will need it!**

4

Exam Format

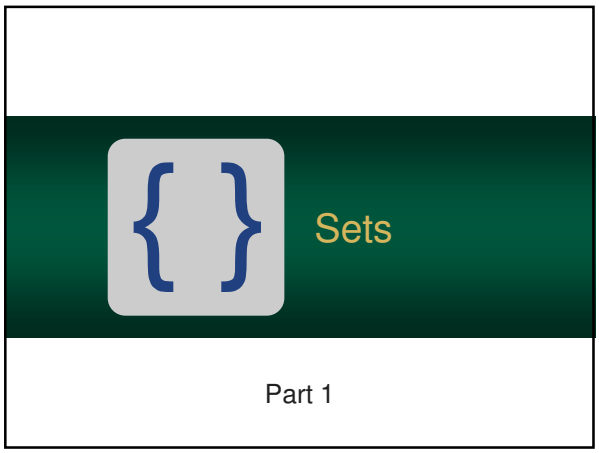
- You must open Zoom during the exam
- You must be on camera
- No camera: -25 points
- …this is also so I can talk to the class if necessary and you can ask questions

5

Exam Format

- If you don't have a webcam, download Zoom on your phone and use it
- If you do use your phone, remember to plug it in to the charger (keep the battery from dying)

6



7

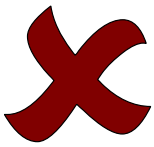
Part 1 – Need to Understand

- Standard sets (Z, Q, etc…)
- Set Builder notation
- Venn diagrams
- Set operators
- Set algebra
- Tuples

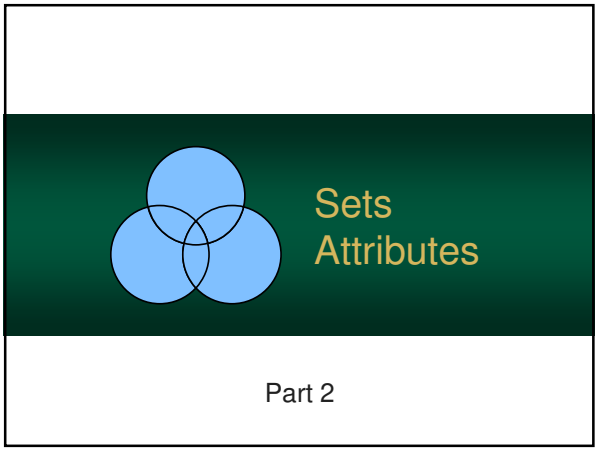
8

Part 1 – Don't Worry About

- Example sets (Meeseeks)
- Duels



9



10

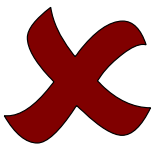
Part 2 – Need to Understand

- Fundamental Products
- Cardinality
- Inclusion-Exclusion
- Power Series
- Partitions

11

Part 2 – Don't Worry About

- *Sorry, know it all*



12

Sets in Computer Science

Part 3

13

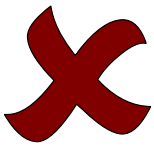
Part 3 – Need to Understand

- Binary numbers
- Bit vectors

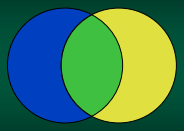
14

Part 3 – Don't Worry About

- Encoding IEEE floating point numbers (still need to know the concept, though)



15



Relations

Part 4

16

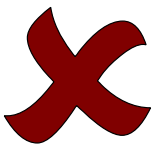
Part 4 – Need to Understand

- Cross products
- Binary relations
- Types of relations
- Manipulating Relations
- Closures
- Functions
- Composition

17

Part 4 – Don't Worry About

- *Sorry, know it all*



18

Relations in Computer Science

Part 5

19

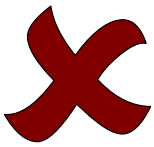
Part 5 – Need to Understand

- Abstract Data Types
- Database terminology
- Functions in programming languages are function signatures

20

Part 5 – Don't Worry About

- SQL
- Different programming language notations



21

Logic Statements

Part 6

22

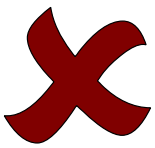
Part 6 – Need to Know

- Boolean logic is set theory
- Boolean operators
- Implication!
- Precedence
- Tautology / contradiction
- Logic equivalences

23

Part 6 – Don't Worry About

- George Boole
- My "Gold Rush" example



24

Arguments

Part 7

25

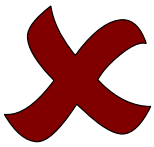
Part 7 – Need to Know

- Arguments are implications
- Valid arguments
- Logical fallacies

26

Part 7 – Don't Worry About

- *Know it all*



27

Fallacy of Affirming a Disjunct

$p \vee q$

p

$\neg q$

Just because p is true, doesn't mean q has to be false.

28

Fallacy of the Converse

p	q	$p \vee q$	$\neg q$
T	T	T	F
T	F	T	T
F	T	T	F
F	F	F	T

29

Proof

Part 8

30

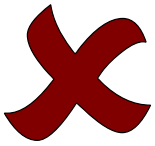
Part 8 – Need to Know

- Theorems & Definitions
- Direct proof
- Proof by contrapositive

31

Part 8 – Don't Worry About

- Proof by contradiction (still know the approach)



32

Quantified Logic

Part 9

33

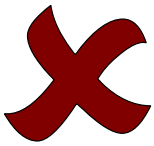
Part 9 – Need to Know

- Quantifiers
- Quantifier Equivalencies
- Bound/Free Variables
- Bounded Quantifiers
- Converting to English

34

Part 9 – Don't Worry About

- *Know it all*



35

Induction

Part 10

36

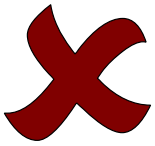
Part 10 – Need to Know

- Induction!

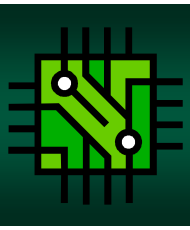
37

Part 10 – Don't Worry About

- Strong Induction



38



Circuits

Part 11

39

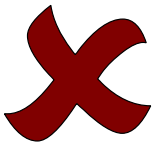
Part 11 – Need to Know

- Gates
- Converting a Boolean Expression to a Circuit
- Converting a Circuit to a Boolean Expression
- CPE notation

40

Part 11 – Don't Worry About

- *Know all of it!*



41

Creating an Arbitrary Circuit

Part 12

42

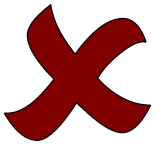
Part 12 – Need to Know

- Disjunctive Normal Form (aka Sum of Products)
- Converting a table to a Boolean Expression
- Karnaugh Maps
- Don't Care
- Functional Completeness

43

Part 12 – Don't Worry About

- *Know all of it!*



44