CSC165 fall 2017

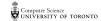
Mathematical expression

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Web page:

http://www.teach.cs.toronto.edu/ \sim heap/165/F17/ 416-978-5899

Using Course notes: Prologue, Mathematical Expression





Outline

Introduction

sets

functions

sums and products

propositional logic

notes

annotated slides





what's CSC165?

a course about expression (communication):

- with and through programs
- with developers
- knowing what you mean
- understanding what others mean
- analyzing arguments, programs



CS needs math:

- graphics
- verification
- cryptography
- ▶ artificial intelligence
- complexity
- numerical analysis
- networking
- databases

doing well in CSC165

Doing well has two aspects: one being recognized as doing well by being awarded credit (grades), another being able to retain concepts and tools for use later on. Here's how to do both:

- ▶ Read the course web page, and emails, regularly. Understand the course information sheet.
- ▶ Spend enough time. We assume an average of 8 hours/week 4 in lecture/problem sessions, 4 reviewing preparing assignments
- ▶ Ask questions. Make your own annotations.





balance

- computers are precise in identical environments they execute identical instructions identically
- humans are as precise as necessary, and different human audiences require different levels of precision
- ▶ The really difficult job is finding the right level of precision. Too much precision introduces unbearable tedium; too little introduces unfathomable ambiguity.
- ▶ Proofs are primarily works of literature: they communicate with humans, and the best proofs have suspense, pathos, humour and surprise. As a side-effect, proofs present a convincing argument for some fact.





building sets...in math

English prose

list elements

set comprehension



some standard sets

boolean operations on sets

operations that produce new sets

sets of sets...

size of sets

specify functions

▶ ordered pairs

pictures

▶ rule

from/to, domain/range, arrow notation

one-to-one, onto, etc.

sums, products

manipulating sums and products



propositional logic

▶ statements, variables

operators

not \neg , and \wedge

or \lor , implies \Rightarrow

Notes



annotated week 0

