CS 145 – Foundations of Computer Science

Professor Eric Aaron

Lecture – W F 1:30pm
Lab – F 3:30pm

Lecture Meeting Location: SP 105
Lab Meeting Location: SP 309

Instructor Info

• Professor Eric Aaron

  Website: http://www.cs.vassar.edu/~eaaron
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  Office Hours:
    Tu 1:30-2:30pm, Th 3:30-4:30pm, and by appointment (may change; see my website).
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  NB: The above email address is the best way to contact me
  Course Website:
    http://www.cs.vassar.edu/~cs145/
A tiny bit about the course

• Your textbook:
  – *Sets, Logic and Maths for Computing 2nd Edition*, by David Makinson
  – See the course website’s *Some Useful Links* page for how to access the book for free(!) online

• A Scheme reference:
  – Scheme summary from Prof. Luke Hunsberger
  – also available from the course website’s *Some Useful Links* page

A tiny bit more about the course

• What we’ll cover
  – Mathematical foundations: Sets, relations, functions, …
  – Proofs: logic, induction, sets …
  – (Program correctness)
  – Programs: programming in Scheme, but (almost certainly) nothing you haven’t seen before
    • See our *Some Useful Links* page for notes about the version of Scheme for this course, and the related DrScheme software
Proofs

• What makes proofs important to Computer Science?
  – Do we need proofs? What benefit do we get from them?

Here’s a proof (or “proof”) now!
It shows that 2=1, which is a somewhat non-intuitive result!

• Start with two non-zero numbers x and y, such that \( x = y \)
• Then, multiplying by x, we get: \( x^2 = xy \)
• Subtracting the same thing from both sides: \( x^2 - y^2 = xy - y^2 \)
• Factoring, and dividing both sides by \( (x-y) \), we get: \( x + y = y \)
• Since \( x = y \), \( x + y = 2y \), so we see that: \( 2y = y \)
• Dividing both sides by \( y \), we get: \( 2 = 1 \)

Is there a problem with this reasoning?

Assignments

• Reading: Ch. 1.1-1.4 in our textbook

• Also, email me from the account at which you’d want me to contact you
  – Include a sentence on what you’d like to get out of the course
  – … plus anything else you might like to tell me!
  – Also, in your email, let me know if you were able to access the course website and lecture notes without any difficulties
    • Remember: website is at http://www.cs.vassar.edu/~cs145/

  – Note: my preferred email is eaaron@cs.vassar.edu
    (not eraaron@vassar.edu)
Business

- We will have a lecture Friday in our lab time
- How many of you have previously worked with Racket? with Scheme?
- How many of you do not have a Vassar CS computer account?

But before the set up, a little math review...

- What’s the formula for the sum of the first $n$ positive integers?
- How do we prove it?
- How would we write a simple Scheme function `sum-one-to-n` that takes input $n$ and returns the sum from 1 to $n$?