CS 145 – Foundations of Computer Science

Professor Eric Aaron

Lecture – T R 3:10pm
Lab – M 3:10pm

Lecture Meeting Location: OH 162
Lab Meeting Location: SP 309

Instructor Info

• Professor Eric Aaron

  Website: http://www.cs.vassar.edu/~eaaron
  Office: SP 305
  Office Hours: T / R 4:30-5:30pm (after this class!), and by appointment (may change; see my website).
  Phone/Voicemail: (845) 437-7293
  E-mail: eaaron@cs.vassar.edu

  NB: The above email address is the best way to contact me
  Course Website: http://www.cs.vassar.edu/~cs145/

All Vassar faculty members are “responsible employees” regarding Title IX reporting.
I take Title IX seriously. Please talk with me for more information!
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

• Your Scheme reference / textbook:
  – *Introduction to Computer Science via Scheme* by 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
    • Emphasis on *functional programming* methods and design, in preparation for higher-level CS coursework and problem solving
    • 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!

<table>
<thead>
<tr>
<th>Step</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Start with two non-zero numbers $x$ and $y$, such that $x = y$</td>
</tr>
<tr>
<td>2</td>
<td>Then, multiplying by $x$, we get: $x^2 = xy$</td>
</tr>
<tr>
<td>3</td>
<td>Subtracting the same thing from both sides: $x^2 - y^2 = xy - y^2$</td>
</tr>
<tr>
<td>4</td>
<td>Factoring, and dividing both sides by $(x-y)$, we get: $x + y = y$</td>
</tr>
<tr>
<td>5</td>
<td>Since $x = y$, $x + y = 2y$, so we see that: $2y = y$</td>
</tr>
<tr>
<td>6</td>
<td>Dividing both sides by $y$, we get: $2 = 1$</td>
</tr>
</tbody>
</table>

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 Monday in our lab time

Monday 1/29 only: We will meet in room SP 105!

• How many of you have previously worked with Racket? with Scheme?

• How many of you do *not* have a Vassar CS computer account?