CSC151.02 2013F, Class 19: Iteration

Overview

- Preliminaries.
  - Admin.
  - HW5.
- Procedures and side-effects.
- for-each vs. map.
- Lab.

Admin

- Let me know if you have partner preferences for HW5 by 10pm tonight. I’ll try to have partners ready by class tomorrow. (Just posted on the Web.)
- You will have a substitute teacher (Mr. Walker) and mentors (Ms. Ryan and maybe Mr. Wheeler) on Wednesday and Friday. Mr. Abuah will provide continuity.
- Work for Wednesday:
  - Finish homework 4. DO NOT DO (drawing-hshift (drawing-vshift (drawing-group (drawing-hshift (drawing-vshift drawing-unit-circle 17)
  - Start looking at homework 5
  - Read Local Bindings with Let
  - Do Lab writeup 9: Turn in 4c, 4d and 5e from the Iteration Lab
    - Try to get it in for Wednesday.
    - Due before class on Friday.
    - Title: "CSC 151.02 Lab Writeup 9: Iteration (NAMES)".
- Don’t forget the upcoming mentor sessions
  - Thursday at 7:30pm
  - Sunday at 7pm
- EC Opportunities:
  - CS Extras Thursday @ 4:30: Three Students on Student Sysadmin Work
  - CS Table Friday (Coding the Law)
  - Maybe a scrimmage for Mock Trial. (Details to follow.)
  - AS talk, Monday at noon. Learn about a new algebra. And eat free Pags pizza while being confused.
  - Juggling class Saturday 7-8pm, in Multipurpose Dance Studio in the Bear
  - Super Smash Bros tournament, talk to WP about it.
- Other things you might do (no EC, but possibly a good idea)
  - Poweshiek CARES March Thursday, Oct. 3. Meet at Drake Library at 5 p.m.
  - GHS Homecoming Parade Thursday, Oct. 3. If you’ve never seen a small-town homecoming parade, it’s worth it.
A Quick Overview of HW5

Procedures and side effects

- There’s a transition in the way we think about procedures.
- First procedures, things like square, *, drawing-hshift
  - Don’t affect their parameters (define x 2) (square x) x (drawing-scale drawing-unit-circle 10)
- Implication: Some order of evaluation doesn’t matter (drawing-group (drawing-recolor d1 "red")
  (drawing-hscale d1 100) (drawing-vsacle d1 4) (drawing-shift d1 80))
- New procedures: Change the underlying parameter (turtle-forward! t 100)
  (turtle-forward! t 100) (turtle-turn! t 100) (turtle-up! t (turtle-face! t 100))
- We now need to think much more carefully about the order in which operations are evaluated.

Loops and Repetition

- Repeat a similar operation again and again and again
  - (map proc lst) -> apply a procedure to each element of a list, creating a new list. NO
    GUARANTEE ABOUT ORDER
  - map doesn’t work so well with the new procedures
  - (repeat number action! parameter1 ... parameterN) - Do action number times
- map: Same procedure, different inputs (and create a list)
- repeat: Same procedure, same inputs (and no list)
- Need: Same procedure, different input, GUARANTEED ORDER, no list
  - (for-each proc! lst1 lst2 ...) - Apply proc! to first element of each list, then second, then third, ...

for-each vs. map

- Order of evaluation: map order is unknown, for-each, order is left-to-right
- Result: map gives list, for-each gives nothing

Detour: drop vs increment

- (list-drop (iota 6) 1) => (1 2 3 4 5) - cross of the first 1 elements
- (map increment (iota 5)) => (1 2 3 4 5)
- What’s the diff?
- map increment requires that we do math for every element of the list
Lab

- Hidden and strange ways to get info about turtles

(define tortoise (turtle-new ...)) (tortoise ':row) (tortoise ':col) (tortoise ':angle)

Samuel A. Rebelsky, rebelsky@grinnell.edu

Copyright (c) 2007-2013 Janet Davis, Samuel A. Rebelsky, and Jerod Weinman. (Selected materials are copyright by John David Stone or Henry Walker and are used with permission.)

This work is licensed under a [Creative Commons Attribution 3.0 Unported License](http://creativecommons.org/licenses/by-nc/3.0/) To view a copy of this license, visit http://creativecommons.org/licenses/by-nc/3.0/ or send a letter to Creative Commons, 543 Howard Street, 5th Floor, San Francisco, California, 94105, USA.