



The University of North Carolina at Chapel Hill

COMP 144 Programming Language Concepts
Spring 2002

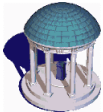
Lecture 28: More on Functional Programming

Felix Hernandez-Campos

April 1

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Advanced Functional Programming

- Functional programming languages can increase readability
 - But they can also help developing obfuscated code
- *Unlambda* is a functional programming language specifically designed for this task
 - It is powerful (Turing-complete)
 - It is the ideal language for *abstraction-elimination*

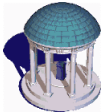
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Programming Principles

- Seven primitive functions :
 - k,
 - s,
 - i,
 - v,
 - d,
 - C, and
 - .x



Numbers

- Church integers:
- $\langle 0 \rangle$ is $\lambda f \lambda x. x$ (i.e. `ki).
- $\langle 1 \rangle$ is $\lambda f \lambda x. f x$ (i.e. i).
- $\langle 2 \rangle$ is $\lambda f \lambda x. f (f x)$ (i.e. ``s``s`kski).
- $\langle 3 \rangle$ is $\lambda f \lambda x. f (f (f x))$ (i.e. ``s``s`ksk``s``s`kski).
- and so on...

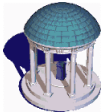


The Shocking Truth

- “It's disgusting — it's revolting — we love it.”
CyberTabloid
- “Unlambda, the language in which every program is an IOUCC.” *Encyclopædia Internetica*
- “The worst thing to befall us since Intercal.”
Computer Languages Today
- “The effect of reading an Unlambda program is like habing your brains smashed out by a Lisp sexp wrapped around an ENIAC. You won't find anything like it west of Alpha Centauri.” *The Hitch-Hacker's Guide to Programming*

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Source of this evil

- Reference
 - <http://www.eleves.ens.fr:8080/home/madore/programs/unlambda/>
- Extra credit
 - A+ guaranteed to the first one that develops a Turtle interpreter in Unlambda

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