CSE 3302
Programming Languages

Chengkai Li
Spring 2008

Self Introduction

- Chengkai Li
- Research interests:
  - databases, Web, information retrieval, data mining
  - http://ranger.uta.edu/~cli
- Looking for undergraduate/graduate students.
  Financial supports available.

Course Page

- http://crystal.uta.edu/~cli/cse3302
  Syllabus, Announcements, Schedule (lecture notes), Homework, Machine Problems, Exams, Resources, Accommodation based on disability.
- Important announcements:
  announcement page
  (http://crystal.uta.edu/~cli/cse3302/announcements.htm)
- Tentative

Basics

- Lectures: Tuesday / Thursday, 3:30-4:50pm, GACB 105
  - Slides don’t cover everything. You need to read the book and supplementary materials.
- Instructor: Chengkai Li
  Office hours: Fri. 10am-12pm, Nedderman Hall 334
  Contact: (817) 272-0162, cli [at] uta.edu
- Assistant Instructor/TA: Weimin He
  Office hours: Tu/Th 5-6pm, GACB 107
  Contact: (817) 272-7618, wmhe [at] exchange.uta.edu

Basics (cont.)

- Prerequisites
  - Background:
    CSE 3315 Theoretical Concepts in Computer Science and Engineering.
    Automata, grammar, regular expression, ...
  - Programming:
    Experiences with at least one major programming language.
Tentative grading scheme

- Homeworks (HW): 15%, individual.
- Machine Problems (MP): 30%, individual.
- Essays (ES): 10%, individual.
- Midterm exam: 20%
- Final exam: 25%
- Bonus points: 5%, based on class participation.

Homework (HW) 15%

- HW1, HW2, HW3, HW4
- Problem-based
- Can discuss, but must write it independently.
- Review the materials learned
- Get you prepared for the exams

Machine Problems (MP) 30%

- MP1, MP2, MP3, MP4.
- Can discuss, but must do it independently.
- Decent amount of programming:
  - Not crazy.
  - But not a piece of cake either.

Essays (ES) 10%

- satisfying ABET requirements
- Can discuss, but must write it independently.
- Must get at least 37.5 (out of 100) on essay, otherwise you will get Incomplete (I) as your grade, no matter what your scores on other components are.
- panel discussion based on essay.

Deadlines

- 11:59pm.
- After due time, deduct 5 points per hour, till you get 0.
  (No exception, unless you have medical or other emergency, with proof documents from the school.)

WebCT

- Assignment instruction and files
- Student assignment submission (we don’t accept email submission or hard-copy)
- Discussion Group
- Grades
Exam

- Midterm: 20%
  Feb. 28th Review
  Mar. 04th Exam (in class), close-book, close-notes

- Final: 25%
  May. 1st Review
  May. 08th Exam, Thursday, 2-4:30pm, close-book, close-notes

Regrade

- 7 days after we post scores on WebCT and send out announcements. TA will handle regrade requests. Won’t consider it after 7 days.

- If not satisfied with the results, 7 days to request again. Instructor will handle it, and the decision is final.

How to get bonus points? 5%

- During lectures:
  - Raise questions. (There are no bad questions.)
  - Actively participate in discussions.
  - But don’t overdo it please.

- Presentation and Panel Discussions:
  - More details later

Get questions after class?

- Discuss with classmates:
  - The best way to learn is to teach.

- General questions (that can be asked by any student):
  - Post on discussion group (WebCT or listserv)

- Individual questions (that apply to you specifically):
  - Email TA
  - No need to CC me. If TA cannot handle it, she will forward to me.

- Come to TA’s office hours or my office hours.

Get bored

- Do you watch Youtube?

http://www.youtube.com/watch?v=qG2ew6gLa8U
http://www.youtube.com/watch?v=463qKcXDVzQ

Don’t do it. It’s not worth it.
CSE 3302: What is it about?
- Exposure to various kinds of languages and paradigms.
- Understand the features, pros/cons of languages.
- Do things in the right way.
- Learn a new language effectively and quickly.
- Choose a language to use for a project/system.
- Design new languages.

CSE 3302: What isn’t it about?
- I want to get easy credit without doing much.
- I want to become a coding guru in C/C++/C#/Java/…
- I want to know every details about implementing a language.
- I want to prove properties of a language.

Big picture
- Let’s draw the picture

Big picture?

What is a programming language?
- Programmers use PLs to instruct computers to do things.
• We talk about high-level general-purpose programming languages.

SELECT name
FROM Students
WHERE status="sleeping"

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• No ambiguity
• Efficient translation/compilation
• ...

• Covered in compiler course

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• This is what really matters
  – Abstractions for describing the actions
  – Data abstraction: subject of computation
  – Control abstraction: transfer of control in computation
  – Human-Human communications
  – Your program will be read by others

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• Imperative/Procedural: (ALGOL, FORTRAN, Pascal, C, Ada)
  control statements manipulate the data and program states
• OO: (C++, Java, Smalltalk)
  data/object-centric
• Functional: (Lisp, Scheme, ML, Haskell)
  everything is done by function evaluations
• Logic: (Prolog)
  axioms (statements about truth) + inferences
• Parallel: (threads in Java)
• Mix: (Python, Perl, Ruby)

Few "pure" languages

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• Syntax: structure of programs (tokens, keywords, statements.)
• Semantics: What are meant by programs

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• Introduction (1 lectures)
• History (0.5 lectures)
• Syntax (2 lectures)
• Semantics (2 lectures)
• Data Types (1 lectures)
• Control (2 lectures)
• Abstract Data Types (1 lectures)
• OO (Java, Smalltalk) (6 lectures)
• Functional (Lisp, Scheme, ML, Haskell) (4 lectures)
• Logic (Prolog) (4 lectures)
• Python (2 lectures: panel discussion)
• A taste of advanced topics and research (2 guest lectures)

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