CS 251 Data Structures

Prof. Luo Si
Department of Computer Science
Purdue University

Administrative Issues

- Instructor: Prof. Luo Si
  (Another section with Prof. Sunil Prabhakar)
- Office Hours:
  - Walk in for short questions, otherwise make appointment via email (lsi@cs.purdue.edu)
- Teaching Assistants:
  - Ryan Phelps
  - Wei-Chiu Chuang
- Web Site:

http://www.cs.purdue.edu/homes/cs251/

Administrative issues

- Text book: "Data Structures and Algorithms in Java ", (5th Edition)
  M. T. Goodrich and R. Tamassia

(Other editions acceptable)

- Syllabus and slides on web page.
- Read the chapter before class.
- Print slides and bring to class.
- There may be some missing slides!
- Take notes in class.

Course Organization

- Grading
  - 45% Programming and Projects
    - About 6 projects + 2 planned homeworks
  - 5% quizzes
  - 50% Exams
    - Midterm Exam: 20% (October 20th, 6:30 – 7:30 pm WTHR 172)
    - Final Exam: 30% (Finals Week -- TBA)
      - Comprehensive, but with emphasis on latter topics.

Missing Exams

- If you cannot make an exam, contact the instructor BEFORE the exam, otherwise you will receive a 0 on the exam.
- Exceptions: documented medical reasons and family emergencies only.
- NO late submissions for projects.
- NO deadline extensions.

Campus Emergencies

- Course requirements, deadlines, and grading are subject to change.
- Course website will be used to notify you.
  - Emergencies include: pandemics, weather extremes, hazardous spills, safety issues, ...
- H1N1 (or other contagious flu)
  - Do not attend lectures or PSOs
  - Contact instructor via email to make arrangements.

6

Logistics

- The course moves very fast.
- You must attend all lectures. PSO is highly recommended.
- Quizzes to give you another incentive.
- Lectures
  - No Mumbling
  - No talking among students
  - Before class, allow me to prepare
- Lectures will assume that you have read the material from the text. We will build on that.

Logistics (contd.)

- Do not skip lectures
- No deadline extensions.
- No late submissions.
- Follow good programming style (see web page).

CS Account

- You will need a CS account
- Go to the CS portal:
  - https://portals.cs.purdue.edu/
- Login with Purdue CAREER account and sign academic integrity policy.

9

Email

- We will use the following alias for class announcements: cs251@cs.purdue.edu
- Add yourself to this alias ASAP:
  - Log on to lore.cs.purdue.edu (CS account)
  - %mailer add me to cs251
- Use cs251-ta@cs.purdue.edu for contacting TAs
- Use care when sending messages (no flaming, no profanity).

Ethics

- Lose several students each semester.
- NOT a team programming course.
- Discussion is encouraged.
- All instances of cheating will be reported to the Dean of Students, and may result in a failing grade or expulsion.
- We use copy detection software!
  - Do not copy code and make changes!
  - Do not copy code from the Web.
- Read course Academic Integrity Policy on web page and SIGN it -- no midterm exam if not signed.

Schedule

- See course web page
- No lectures on
  - September 6th (Labor Day)
  - October 11th (October Break)
  - November 22nd - 27th (Thanksgiving break)
- No lectures, PSOs during Thanksgiving break.
- Midterm: Oct 20th: 6:30-7:30 WTHR 172
- Final Exam: (TBA)

Important Resources

- Class staff
- Course webpage
  http://www.cs.purdue.edu/homes/cs251/
- Java API:
  http://download.oracle.com/javase/1.5.0/docs/api/index.html

IMPORTANT: Prerequisite

- The algorithms will be presented in Pseudo code or Java
- The class assumes that you have good Java background
  - Data types
  - Control flow statements
  - Arrays, Simple classes
  - Inheritance and Polymorphism
  - Exceptions
  - Interfaces and Abstract Classes
- C++ is also assumed and acceptable for projects.
- One project will be done in C++

14

Course Goals

- In this course you will learn how the representation of data in the computer has an impact on the performance of a program.
- We will cover several kinds of data structures and the algorithms associated with these data structures.
- You will also improve your programming skills.

Program = Algorithm + Data Structures

Course Content

- Some Simple Proof Techniques
- Analysis Tools
- Indices, Nodes and Recursion
- Stacks and Queues
- Lists and Iterators
- Trees
- Priority Queues, Heaps and Adaptable Priority Queues
- Maps, Hash, Skip Lists and Dictionaries
- Search Trees
- Sorting, Sets, and Selection
- Text Processing
- Graphs