CMSC 433
Programming Language Paradigms and Technologies
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Course Goal:
expand your toolbox

• By this point, you should be a good software developer

• perhaps stellar

• but compared to professional software developers, your toolbox is likely small

• The course is designed to expand your toolbox and give you experience with some of the things in it
Toolbox

- Concurrency
- Web services
- Security
- Design patterns
- Testing technologies
- Distributed computing
- Software Architecture
Resources

- Lots of different topics
  - excellent online sources or book for each
  - including Safari books online at campus
  - Site source for anything you copy
Waitlist

- 5 students on the wait list
- If you can’t register for any other CMSC 400 level course, I’ll take you off the wait list
  - consider 424: no longer requires 420 as prereq
  - talk to CS undergraduate advisor, get them to sign off that you can’t signup for any other course instead
Course survey

• I’ve mailed out a link to a course kickoff survey
  • also on course web page
• Please complete it by tomorrow night
Grading

• 12 projects/exercises, total of 54%
  • varying points
• 1 midterm, Match 11th, 12%
• 1 final, May 18th, 1:30pm, 20%
• cookies with the professor, 4%
• attendance, 10%
Cookies with Professor

• At the end of the semester, I often find that I’ve only had a conversation with a small number of students in the class

• going to change that

• I’ll schedule get togethers with groups of 3 students, at varying times during the week (at least one a week)

• I’ll supply cookies, cupcakes, cheese and crackers, or something else tasty
Cookie topics

- Cookie discussions not primarily on course projects
- General discussions about computing, research, technology, job prospects, etc.
- Cookie grading is pass/fail: if you attend a cookies discussion, you pass
- You are welcome to attend more than once, but advance reservations only for people who haven’t attended one yet
Called to cookies

• I’ll post a schedule where you can sign up

• You may get “called to cookies”
  • if so, you have to either sign up that week or the next
  • you may defer once, but when you get called a second time, you can’t defer

• If someone has real schedule conflicts, I’ll work something out
Attendance

- You are expected to make a good faith attempt to attend class
- don’t expect perfect attendance
- Attendance will be taken
- after a few unexcused absences, you start loosing points
Projects

- Projects/exercises due pretty much every week
- Individual efforts unless clearly stated otherwise
- Some simple, some harder/bigger
  - Some worth 2%, some worth 6%
Good faith efforts

- You are required to make a good faith effort to complete each project
- Too often seen students that decide to skip a project, figure they are only hoping for a C anyway, dig themselves into a bad hole
- If you do not make a good faith attempt to complete each project, you can be failed for the entire semester
- Only did this once, to a student who blew off several projects and didn’t rarely attended class
Academic integrity

• I take academic integrity very seriously

• I respect the efforts of students to complete difficult projects without cheating, despite temptation

• and thus bring the hammer down on students who cheat

• I’ve been catching students cheating for 20 years

• penalty, even for academic dishonesty on a tiny project, is to fail the entire course with a grade of XF
Avoid temptation

• Too often, I’ve seen students who are otherwise good students put themselves in a situation where it would be very easy to cheat

• they didn’t start out intending to cheat

• but they just snapped and did it

• or someone took advantage of their trust and used their code for more than to “just figure something out”
The TA and I will help you

- The TA and I will supply you with enough help to complete project

- *never* had a student who sought out help that couldn’t complete a project

- But if you want until the night before it is due, or don’t want to talk to the professor or TA, you might get stuck
Getting stuck

- Start projects early
- You will get to points where you are stuck, and can’t figure out how to make progress
- Give your self time to step away from the computer, and talk to me or the TA, or post questions for class discussion
- If start work 6 hours before it is due and get stuck, you are in trouble
Open source contribution project

• Make a contribution to a large open source project (at least 10,000 lines of code) with an active developer community

• Build, test, file bug report, prepare patch, interact with developers

• Can be as simple as running FindBugs and finding a problem

• or adding a feature to a widely used tool
Open source project

• Due at end of the semester
  • with benchmarks/milestones throughout the semester
• No requirement that it be Java
• Group projects allowed/welcome
  • expect a bigger/impressive contribution
A+ grades

• The average of your scores on graded course material determines your letter grade, A-F

• If you earn an A, and you also do something impressive related to but above and beyond required class work, you get an A+
  
  • extension of project
  
  • impressive open source contribution
  
  • course work/projects discussion in class or on-line
Graduating?

• Your need to graduate has no impact on your grade
• If you are worried about passing the course, the last week is not the time to start talking to me
• If you are at a C or below after the midterm, be worried
Google fanboy alert

- Conflict of interest warning:
  - I am a fan of Google’s software frameworks
  - spent the 2008-2009 school year on sabbatical at Google
  - also a stock holder and occasionally paid by them
- We’ll be doing a number of projects involving Google infrastructure
Projects

- Project ideas, subject to change
Project 1

• Deploy sample guestbook application to Google AppEngine

• Google provides free web hosting (bandwidth limited)

• Group/collaborative effort

• Due Feb 2nd
Project 2

• Idea board
• Post ideas, and everyone can vote on them (+ or -)
• Can view idea board sorted by number of votes
• Similar to Google moderator
• Due Feb 8
Project 3

• Secure your idea board against cross site scripting and cross site request forgery attacks
  • and attack the code of other students

• Due Feb 15
Project 4

• Picture expression language:

```python
bill = image("http://www.cs.umd.edu/~pugh/bill.jpg");
distorted = pixelate(bill, 4);
distortedBlue = rgb(bill, bill, distorted);
```

• Project involves parsing, reflection, decorator design pattern

• Due Feb 22
Project 5

- Concurrency exercise
- Due March 2nd
Project 6

- Concurrent simulation
- See project 3, fall semester
- Due Match 9th
Project 7

• Concurrent game of life
  • see project 4, fall semester
• Due March 30
remaining projects

• Mocking frameworks for tests
• distributed exercise
• implementing map reduce
• ?
• open source contribution
Tools

• Java 6 (Java 7 optional)

• JUnit 4

• Eclipse J2EE 3.5+ (3.6 milestones untested but should be OK)

• Eclipse plugins:
  • Course project manager
  • FindBugs
  • Google AppEngine
Class discussions

• I’d like to try Google wave

• Although I’ve seen the code, no real experience using it

• Would it be a good replacement for CS forum?

• Also, we could do a project with Wave robots

• Alternatives: CS Forum, Google groups

• based on early survey results, CS forum likely primary source
Contacting me

• Office is AV Williams 4121
• Office hours TBA
• You are always welcome to poke your head in for a quick question. If I have time, I’ll be happy to answer
• Email: pugh@cs.umd.edu
• AIM: pughcsumdedu
• jabber/gtalk: bill.pugh@gmail.com
• do not send email to this address