Postlude

Done with CS 1110
Where to Next?
Announcements

Finishing Up

- Submit a course evaluation
  - Will get an e-mail for this
  - Part of the “participation grade” (e.g. clicker grade)
- Final, Dec 9th 7:00-9:30pm
  - Study guide is posted
- Conflict with Final Exam?
  - e.g. > 2 finals in 24 hours
  - Submit conflicts TODAY

Review Sessions

- Sunday 2-5 (Room TBA)
  - Call frames & diagramming
  - Classes, try-except
- Monday 1-4 (Room TBA)
  - Lists, recursion
  - Open question session
- Tuesday 1-4 (Room TBA)
  - Invariants, algorithms
  - Open question session

Submit a course evaluation
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Conflict with Final Exam?
- e.g. > 2 finals in 24 hours
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Obvious Next Step: CS 2110

- **Programming in Java**
  - Basic Java syntax
  - Static vs. Dynamic Types
  - Adv. Java Topics (e.g. Threads)

- **OO Theory**
  - More design patterns
  - Interface vs. Implementation

- **Data Structures**
  - Binary Trees
  - Linked Lists
  - Graphs

**Java Specific**

**Language Independent**

Major CS Topic

12/03/15

Future Courses
CS 2110 Immediately Opens your Options

CS 2110

CS 4620

CS 3410

CS 3152
CS 2800: The Other Important Course

• CS requires a lot of math
  ▪ Analyzing code performance
  ▪ Analyzing data
  ▪ Proving code correctness
• Calculus is “wrong math”
  ▪ Data is rarely “continuous”
  ▪ Limited to specific uses (e.g. spatial data)
• “Grab-bag” course
  ▪ All math needed for CS
  ▪ Includes writing proofs

12/03/15
CS 2110 + CS 2880 = Even More Options

CS 2110

CS 2800

CS 3110

CS 4670

CS 47xx

CS 4810
Higher Level Computer Science Courses

- Programming Languages  x1xx  (e.g. 1110, 2110)
- Scientific Computing   x2xx  (e.g. 3220)
- Data Management       x3xx  (e.g. 3300, 4320)
- Systems               x4xx  (e.g. 3410, 4410)
- Computational Biology x5xx  (e.g. 5540)
- Graphics and Vision   x6xx  (e.g. 4620)
- Artificial Intelligence x7xx  (e.g. 3758, 4700)
- Theory                x8xx  (e.g. 4810, 4820)
- Research              x9xx  (e.g. 4999)
Higher Level Computer Science Courses

- Programming Languages \(x_{1xx}\) (e.g. 1110, 2110)
- Scientific Computing \(x_{2xx}\) (e.g. 3220)
- Data Management \(x_{3xx}\) (e.g. 4320)
- Systems \(x_{4xx}\) (e.g. 4410)
- Computational Biology \(x_{5xx}\) (e.g. 5540)
- Graphics and Vision \(x_{6xx}\) (e.g. 4620)
- Artificial Intelligence \(x_{7xx}\) (e.g. 3758, 4700)
- Theory \(x_{8xx}\) (e.g. 4810, 4820)
- Research \(x_{9xx}\) (e.g. 4999)

Separation not perfect; there is a lot of overlap
Programming Languages

• Adv. Language Topics
  ▪ Functional languages
  ▪ Streaming languages
  ▪ Parallel programming

• Language Theory
  ▪ New languages/compilers
  ▪ Software verification

• Software Engineering
  ▪ Design patterns
  ▪ Architecture principles
Scientific Computing

- **Calculus + Computing**
  - Problems from other science domains
  - Process with computer

- **Applications**
  - Complex simulations
  - Physics (games!)

- **Challenge: Performance**
  - Programs can run for days!
  - How do we make faster?

CS 1132 + Math 2220

- CS 3220
- CS 4220
- CS 5643
Data Management

- **Modern Web Apps**
  - Storing user/session data
  - Coordinating users

- **Databases**
  - Query languages
  - Database optimization
  - Organizing your data

- **Information Retrieval**
  - Searching
  - Data analysis

12/03/15 Future Courses
Systems

• **Building BIG software**
  - Operating systems
  - Distributed applications (e.g. online, networked)
  - Cloud computing

• **Also System Security**
  - Though that is spread about

• **Senior/masters level classes**
  - Bulk of the 5xxx courses
  - But great project courses!

12/03/15  Future Courses
Computation Biology

- **No undergrad classes**
  - Too much to learn
  - Masters/PhD level
- **Undergrad options**
  - **BTRY 4840**: Comp. Genomics
  - BSCB department
- **Hoping to improve...**
• **Not** modeling/art!

• **Rendering & Animation**
  - Illumination/reflection
  - Cloth/hair simulation
  - Water and fluids

• **Processing Images**
  - Recognizing shapes
  - Assembling 3D models from 2D pictures
  - Smart cameras

**Future Courses**

- CS 4620
- CS 5625
- CS 5643
- CS 4670
Artificial Intelligence

- Not sentient computers
- Machine learning
  - Discovering patterns
  - Making predictions
- Natural Language Proc.
  - Automatic translation
  - Searching text/books
  - Voice-control interfaces
- Robotics
  - Autonomous control
Theory

• Analysis of Algorithms
  ▪ What is possible?
  ▪ What is feasible?

• Analysis of Structures
  ▪ Social network theory
  ▪ Complex data structures

• Cryptography
  ▪ Theory side of security

• Perhaps the most famous group in the department
What About Games?

• CS 3152, Spring only
  ▪ **Prereq:** CS 2110
  ▪ But CS 3110 a big help
• Build game from scratch
  ▪ Want it to be innovative
  ▪ You own the IP
• Interdisciplinary teams
  ▪ 5 to 6 people on a team
  ▪ With artists/designers
• **Final:** public showcase
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Games and the Designer Track

• Coding not your thing?
• INFO 3152 (co-meets)
  ▪ Artists/designer track
  ▪ No formal training needed
  ▪ Submit me a portfolio
• Recommend: INFO 2450
  ▪ Start of the HCI sequence
  ▪ How design effects the user experience
  ▪ Fall course; no prerequisites
Good Bye!