Welcome to CS 15 in Salomon 101!

- We encourage you to download the PowerPoint slide deck before lecture and bring your laptop – lets you see clearly and annotate
  - [http://cs.brown.edu/courses/cs015/](http://cs.brown.edu/courses/cs015/)
- We record and give you web access to every lecture
  - in case you have to miss a lecture
  - PowerPoint slides come with associated recording

Our Hardware

- The Sunlab: 80 PCs running Debian Linux
  - Intel Core i5 (3.5 GHz) CPUs with 8GB RAM
  - row 6: nVidia GeForce GTX 970 graphics cards
  - other machines: nVidia GeForce GTX 460 graphics cards
  - dual & wide screen Monitor Configurations
- File Servers
  - terabytes of disk space for your programs
- Can work from your dorm room on your own computer
  - there will be a Working From Home session
  - help slides from session will be posted online!
CS15 is All That

- Teaches Object-Oriented Programming (OOP)
  - most common current programming methodology
  - Brown was earliest to switch to Java for intro courses more than a decade ago
- Teaches fundamental problem solving skills useful in all disciplines
- Provides introduction to computer science concepts
- Is intense, but fun, especially with interactive graphics
- Uses games as a domain, but teaches skills applicable across domains
  - not a game design course (we have those too, 2D and 3D game engine design)

Who is CS15 For?

- Students with varying levels of programming experience, including NONE!
- Most students have little or no programming experience, including the TAs and HTAs when they took the course!
- Prospective CS concentrators, who will go on to CS16
- This is not a weeding-out course, but is still very difficult
  - Don’t worry!! We expect lots of confusion in the beginning. All 50 TAs are here to help you!

Diversity & Inclusion in CS15

- Mosaic+ mosaic.plus.brown@gmail.com
  - “created to foster Community, inspire Innovation, and provide opportunity to underrepresented minority students.”
- Women In Computer Science (WiCS) wics@lists.cs.brown.edu
  - “formed by female undergraduate students at Brown in the late 1980s. The goal of WiCS is to increase the participation of women in the field of Computer Science.”
- Women in Science & Engineering (WiSE) WiSE@brown.edu
  - “to encourage women who study in all science and engineering fields, by building a community of like-minded scholars that provides peer support on their journey to becoming successful scientists at Brown and beyond.”
- Our own CS15 mentorship program!
  - more on this later
Why Java

- Java
  - supports interactive OOP
  - syntax similar to C++ but simpler, cleaner, and more beginner-friendly
  - allows platform-independence: write once, run everywhere (in principle)
  - one of the most prevalent languages in industry today, e.g., Android, web servers (others include C, C++, C#, Python, Ruby, etc.)
  - note: not the same as JavaScript, a less purely object-oriented language used commonly in web applications

Course Mechanics (1/3)

- **No quizzes or exams!**
  - no exam time pressure
  - no "grading on a curve": you do the work, you get the grade you deserve! Thus A is by far the most common grade

- **10 Assignments**
  - 7 programming assignments, some of which have a design component
  - from brief homeworks to Tetris and beyond!
  - choose from a selection of final projects, or create your own "indy" project
  - all programs must meet a baseline level of functionality to receive credit, lots of room for "bells and whistles" for fun and extra credit
  - all programs must be handed in with baseline functionality by end-of-semester!

Course Mechanics (2/3)

- **Keys to success**
  - start early, work steadily, don't fall behind!!!
  - you can't cram, unlike in many other courses
  - exponential growth of program complexity throughout the semester (program size and intricacy)
  - other courses don't teach you to tackle programs of this complexity

- **TA Hours**
  - 46 TAs and 4 Head TAs
  - 168 TA hours of personalized help per week!!!
    - more than in any other course!
    - everyone struggles sooner or later, including the TAs – part of the learning process
    - we strongly encourage you all to go to hours and get to know the TAs - it is integral to the course (and NOT a sign of weakness!!)
Course Mechanics (3/3)

- CS15 thrives on your feedback
- Questions *highly* encouraged during lecture!
- We provide a lot of written material; YOU are responsible for digesting all of it

Major Changes This Year (1/3)

- Pair programming in labs
  - stronger encouragement of supervised collaboration
  - introduce partner programming (new to CS15)
  - an opportunity to meet new people!

Major Changes This Year (2/3)

- CS15 Mentorship Program
  - provide a simple and easy way for students and TAs to get to know each other
  - increasing accessibility of the course and the department
Major Changes This Year (3/3)

- Breakout sessions for TA hour lines
  - Resource for students waiting in line
  - Efficiently explain concepts
  - Hopefully gives you the tools to solve your own bug!

Alternatives to CS15 (1/3)

For Concentrators & Non-concentrators:

- CS17 (fall semester) – Philip Klein
  - Also, no prior experience required
  - Multiple programming paradigms
  - Multiple programming languages
    - Racket, OCaml in CS17, then Java, Scala in CS18
  - Mastery, not mystery – no magic
  - Focus on problem-solving skills/strategies
    - Emphasis on abstraction and scale
  - Integrate programming with analysis of algorithms
  - Multiple application areas (AI, databases, etc.)
  - Pair programming for labs and projects
  - For more information on other CS courses:
    http://cs.brown.edu/degrees/undergrad/whatcourse/

Alternatives to CS15 (2/3)

For Concentrators & Non-concentrators:

- CS0111 (CS-A) (fall semester) – Kathi Fisler
  - No prior experience required
  - The first in a new introductory computing sequence that spreads the foundational concepts over three courses rather than two
    - "Allow more time to combine CS with other studies & mastering the fundamentals"
  - Functional programming and imperative programming
    - Learn Pyret and Python
  - Integrates programming with data science and discussion of use of digital information
  - Less intensive workload
  - Capped at 62 Students, only sequence that is currently capped
  - Fill out this form to be added to waitlist:
    https://docs.google.com/forms/d/e/1FAIpQLSeubLR2z5pDBYyaGVIUVOu5bRXnWbOzOqWUAEpE9Gquw/viewform
Alternatives to CS15 (3/3)

For Concentrators & Non-concentrators:

- CS15/16, CS17/18, CS-A, & CS19 fill concentration requirements.
- All qualify you to take upper level courses, but do cover different material, from different points of view
- Higher course number does not mean higher difficulty
- For more information on other CS courses: http://cs.brown.edu/degrees/undergrad/whatcourse/

Alternatives to CS15 and CS17/19

For Non-concentrators:

- CS20: The Digital World (Fall) - Donald Stanford
  - Introduction to computing; little emphasis on programming
  - Discusses computing topics such as artificial intelligence, IT security, and digital media
  - A small introduction to HTML, Photoshop, Access, and Python
- CS30: Introduction to Computation for the Humanities and Social Sciences (Fall) - Christopher Tanner
  - Intro to use of computation for solving problems in the social sciences and the humanities
  - Investigate real-world problems taken from the news, books, and current research
  - Data gathering, analysis, and visualization; web-based interfaces; algorithms; and scripting
- CS40: Introduction to Scientific Computing and Problem Solving (Spring) - Daniel Potter
  - Use MatLab and some Python
  - Teaches techniques to solve scientific problems using computers

Collaboration (1/5)

- Brown’s Academic Code
  - “Academic achievement is evaluated on the basis of work that a student produces independently. A student who obtains credit for work, words, or ideas that are not the products of his or her own effort is dishonest and in violation of Brown’s Academic Code. Such dishonesty undermines the integrity of academic standards of the University. Infringement of the Academic Code entails penalties ranging from reprimand to suspension, dismissal, or expulsion from the University.”
Collaboration (2/5)

- CS15 Collaboration Guidelines
  - Homeworks
    - collaboration and discussion are prohibited
  - Lab Section
    - collaboration and discussion is not only allowed but encouraged
  - Projects
    - discussion allowed only in Design Section!
  - Lectures
    - always allowed to review and discuss with your peers!

Collaboration (3/5)

- MOSS (Measure of Software Similarity)
  - Stanford-hosted AI software used to detect plagiarism - it signals undue similarity and we hand-check the code
  - used across industries in multi-million dollar lawsuits to protect intellectual property
  - every year, MOSS finds multiple collaboration violations (we check multiple years!)
  - last year, 4 cases with 2 or more students
  - punishments typically directed NC, parental notification
  - MOSS is very good at what it does - don't even think of trying to outwit it! (which is more work than doing the assignment!)
  - we also check the web

If ever in doubt about what is allowed, ask a TA!
Better to NC an assignment or even the course than being accused (and likely convicted)!
Note we have a Regret Policy

Collaboration (4/5)

The issue of collaboration in intro courses has been in the news in past years:

- Possible cheating uncovered in popular Harvard computer class
  - The Boston Globe
  - As Computer Coding Classes Swell, So Does Cheating
    - The New York Times
  - Stanford finds cheating — especially among computer science students — on the rise
    - The Mercury News
Collaboration (5/5)

- Collaboration is **not** worth the risk
  - Start early, and get help when you need it! Lots of resources available to help you succeed in this course.