CSCI1111: Intro to Software Development

Welcome, Logistics, and Programming

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AKA “Gabe”

Logistics: Materials

- Webpage
  - Linked to from my webpage
- Forum: Piazza
  - see signup information on course webpage
  - Post questions here, not email...unless HW specific
  - Anonymous posts possible
- Book: Zyante online text book
  - See signup information on Piazza
- Homework submissions: blackboard
  - my.gwu.edu link on the left

TODO and homework

- Piazza
- Zyante
- Survey
- Homework!

Logistics: Course + Labs

- Course
  - Some lecture
  - Lots of in-class work
- Labs
  - Guided programming practice
  - Labs in Tompkins, 2nd and 4th floor
- Laptops?
  - Bring to class
  - Normally optional: bring to lab
  - This week: must bring to lab

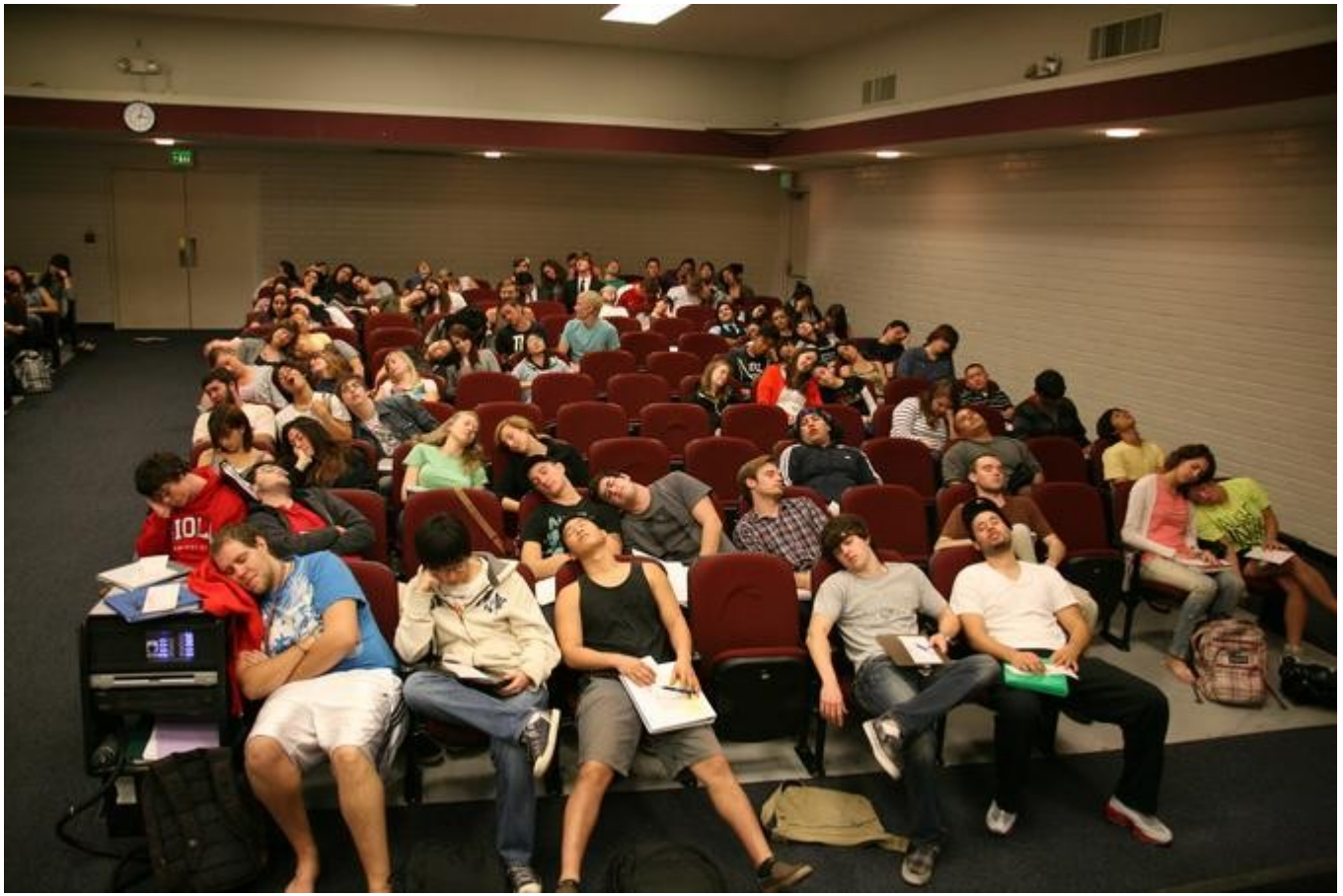
Grading

- Attendance is mandatory
  - Sign in every day as you enter
  - Tardiness is not tolerated
- Participation is mandatory
  - Programming in class + lab, and discussion
- Homework
  - Textbook activities
  - Programming assignments
- Midterm + Final

Academic Honesty

- Do your own work
  - Google does not count
  - Other students do not count
- Please discuss course topics
  - ...but don't share homeworks
- Some group work
  - Do the work only with those in your group
  - Share the work

Boring!!!



“Computing” Major Distribution

- Our first algorithm
  - Counting of majors...
  - ...with distributed computation?

1. Raise hand with digits raised for major
2. Find someone else with the same digits
3. Add your count together
4. One person lowers hand
5. Goto 2

“Computing” Major Distribution

- Our first algorithm
  - Counting of majors...
  - ...with distributed computation?

0. count = 1
1. Raise hand with digits raised for major
2a. Find someone else with the same digits
2b. Unless noone exists – report count!
3. Add your count together
4. One person lowers hand
5. Goto 2

Why are you here?

What is programming?

What is programming?

- Engineering? Art? Skill?
- What is *computer science*?

Computer Science

- Algorithms and Theory
- Systems – OS, embedded, distributed
- Programming languages – logic and semantics
- Robotics – vision + actuation
- Machine learning – statistical reasoning
- Security – Crypto and protection

How is programming related to CS?

- Programming:CS

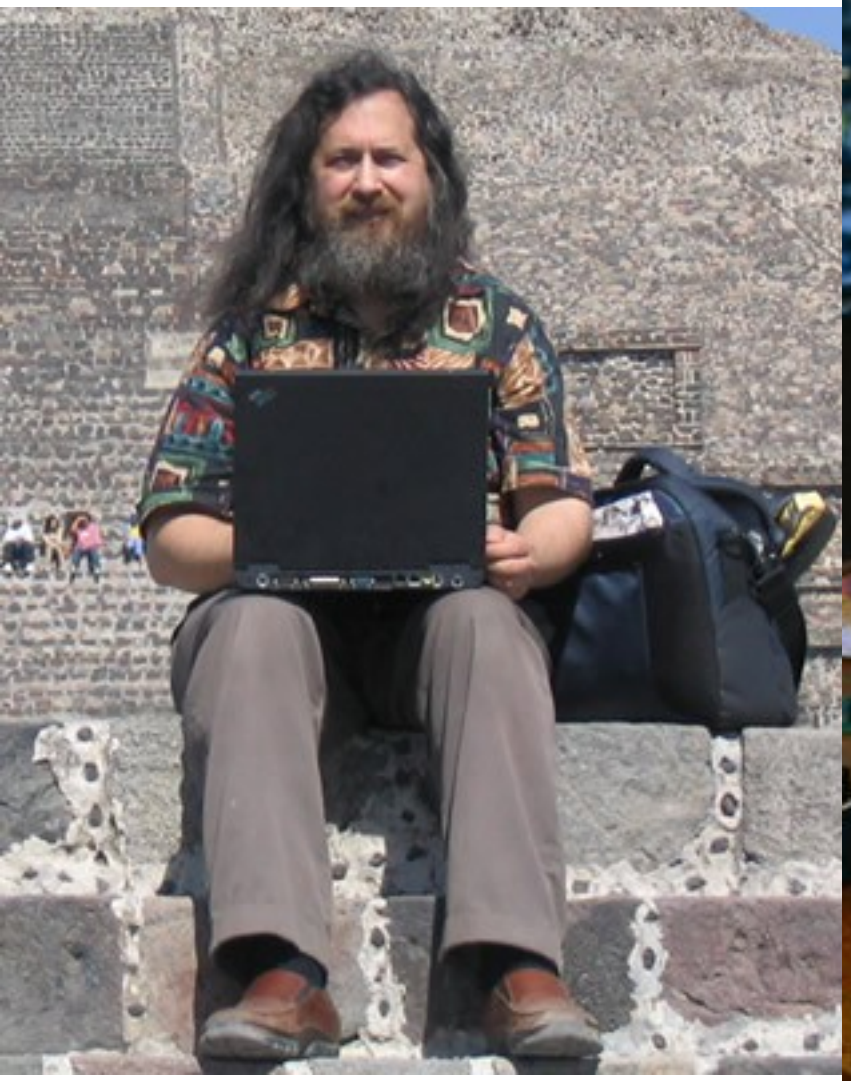
- Telescope:Astronomy
- Proficiency in carpentry tools: Construction of building

- Way to get your foot in the door
  - Many things to come!

Who studies CS?

"But we are hackers and hackers have black terminals with green font colors!"

- John Nunemaker




MICROSOFT

Where is CS used?

- CS is everywhere
- Heart of most engineering disciplines
  - Civil – HVAC controllers, CAD, traffic control
  - Mechanical – CAD, simulations, embedded systems for dynamic behavior, supercomputing
  - ECE – reconfigurable hardware, microprocessor design programs, Oses
  - ...

Where is CS used? II

- Heart of most industries in the world
  - Healthcare – client/doctor mgmt, diagnosis
  - Finance – HFT, trade mgmt software, trend analysis
  - Transportation & Aerospace – Tesla + SpaceX
  - Education – MOOCs
  - Politics – Obama campaign
  - Climate science – supercomputing and ML
  - Entertainment – movies + music
- ...All aspects of *your* life
  - *Techologies impact on your hourly life? Vs 4 years ago?*

CS is **not** just

- App programming
- Writing webpages
- Corporate programming
- Hacking
- GUIs

- ...boring!!!

CS **is**

- CS is the foundation
  for current and future human achievement

- CS is not just “important”
  - It is **essential**

Programming

- Not immensely difficult to learn
  - But takes a *lot* of practice
- Think: learning a musical instrument
  - Comparably: difficult to be **really** good
  - You must **commit** to learning, practice
    - Learning/practicing good habits
    - Hard work
- ...but anyone can do it!

What is “programming”?

- Programming language → execution
- Code – human readable (Java)
- Executable – machine “readable”
- Compiler – converts from code → executable
  - Google translate for computers
  - What happens when you type in nonsense?
  - https://www.youtube.com/watch?v=6Hd0F1QsXR8
  - Must speak language you're translating *from*
- Syntax errors – not speaking “java” correctly

Development Cycle

1. write code
2. compile
3. syntax errors? fix them, goto 2.
4. observe output, compare to expected output
5. assess the situation:
   - did it go wrong?
   - how did it go wrong?
6. if there is a *bug* goto 1
7. success!

A Simple Program