

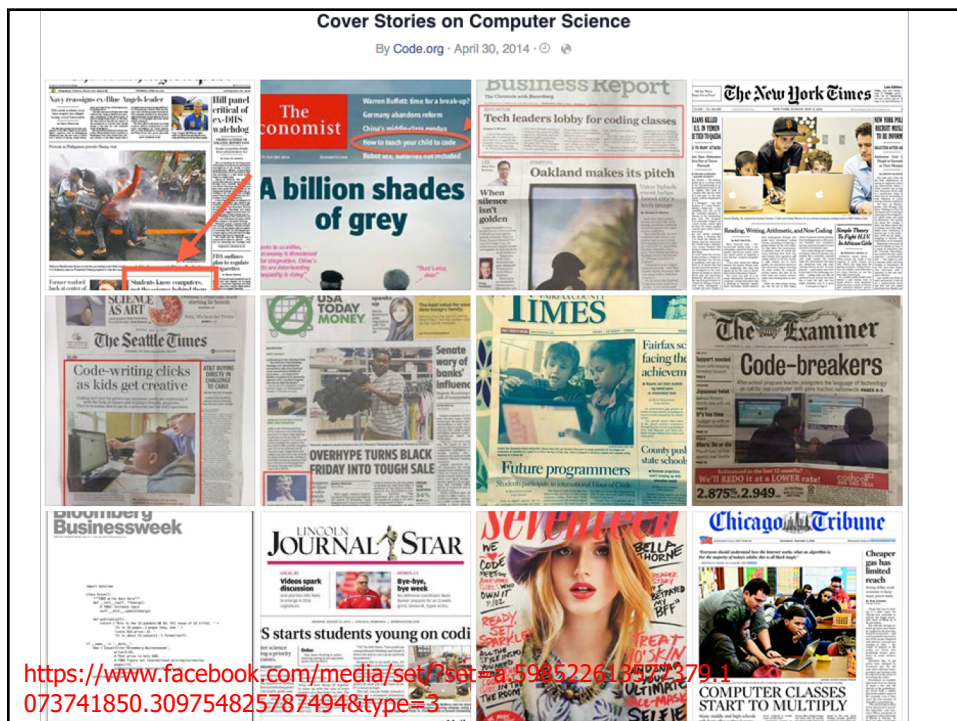
CSCI111: Fundamentals of Programming I

Professor Sprenkle

sprenkles@wlu.edu

<http://cs.wlu.edu/~sprengle/cs111>

Please respond to your survey and return tomorrow in lab



Bloomberg Businessweek

SPECIAL DOUBLE ISSUE June 16 - June 26, 2015 | bloomberg.com

```

import datetime

class Issue():
    """TODO write docs here"""
    def __init__(self, **kwargs):
        # TODO: Validate input
        self.__dict__.update(kwargs)

    def publish(self):
        return ('This is the ({0.pubdate:%d %d, %Y}) issue of ({0.title}). ' +
                'It is ({0.pages:,}) pages long, and ' +
                'costs $({0.price:.5}). ' +
                'It is about ({0.subject}).').format(self)

if __name__ == '__main__':
    bbw = Issue(title='Bloomberg Businessweek',
                price=5.99,
                # That price is only USD;
                # TODO figure out international pricing/currencies
                pages=112,
                pubdate=datetime.datetime(2015, 6, 15),
                subject='code')
    print(bbw.publish())

```

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If You Can't Read That, You'd Better Read This
Code: An Essay 8.13

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My Bio

- From Dallastown, PA
- B.S., Gettysburg College
- M.S., Duke University
- Ph.D., University of Delaware
- For fun: pop culture, gardening, Rockbridge Animal Alliance




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Survey Says...

- What year are you?
- Who has used a computer regularly?
- Who has used the Internet regularly?
- Who has made a web page?
- Who has written a program?
- Why are you taking this course?

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What is Computer Science?

“Computer Science is no more about computers than astronomy is about telescopes.”

--Edsger Dijkstra

- CS = Complexity Science

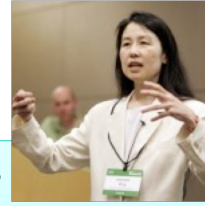
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Jeannette Wing

- Microsoft VP of Research
- Formerly at NSF, CMU



When people talk about the smart grid, smart vehicles, and smart buildings — what makes them ‘*smart*’?

Computer science.

When people talk about personalized medicine and personalized learning, how do you think personalization is possible?

Computer science.

We’re not there yet, but the next generation of computer scientists can help us realize these visions — with immeasurable *benefits* to *society* and the *economy*.

<http://www.nytimes.com/roomfordebate/2011/06/15/computer-sciences-sputnik-moment/writing-code-has-become-self-expression>

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(emphasis is mine)

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CS == Complexity Science or the Study of Complexity

- How can it be done?
 - Based on **information**
 - Managing, manipulating data
 - Possible algorithms
- How well can it be done?
 - Most **efficient** algorithm in terms of time and/or space
- Can it be done at all?
 - Often, proof is a program--an implementation of the above

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Computer Science Fields

Systems

- Architecture
- Operating systems
- Networks
- Distributed and parallel systems
- Databases
- ...

Software

- Compilers
- Graphics
- Software engineering
- Software testing and verification,
- ...

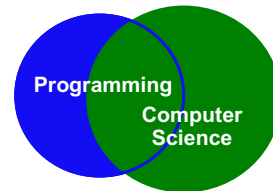
Theory

- Algorithms
- Theory of computation
- ...

Other

- Artificial intelligence
- Robotics
- Natural language processing
- Bioinformatics
- Visualization
- Data science
- ...

- Often research involves combinations of these fields
- Not just programming!
 - But programming is a tool to do much, much more!



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What I do **not** do as a Computer Scientist

- Fix hardware
- Fix Microsoft Windows (or other operating systems) problems
- Fix Microsoft Office (or other desktop applications) problems

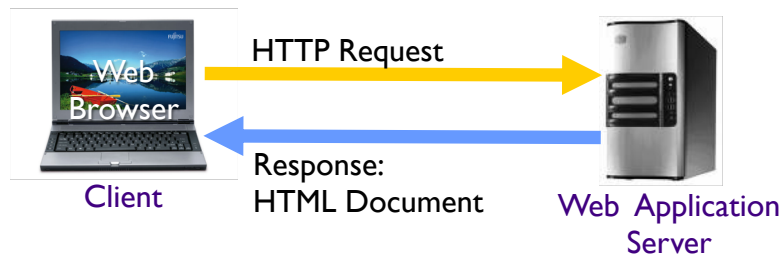
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What I Do as a Computer Scientist

- Interests: Software testing, empirical studies, distributed systems
- Focus: Automated web application testing

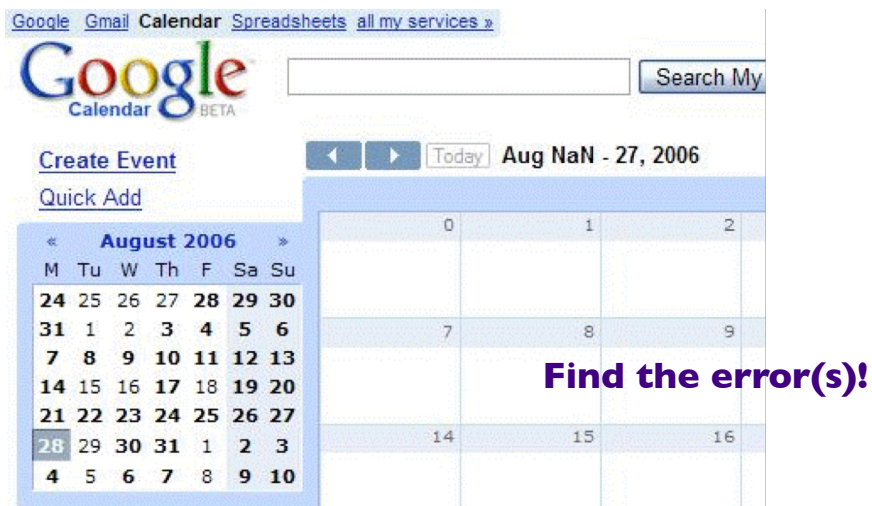


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What I Do as a Computer Scientist



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Find the Errors

Dear SARA,

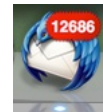
You've spent \$0 in total as of September, 2010.[†] You're almost there!
Just spend \$0 more to receive your NY&C Reward!

84 Items Sort By: Price: Lowest to Highest Items per Page: 12 48 View all 1 2

			
Signature Collection Shimmer Mist Paris Amour \$14.00 Now \$4.00 Limited Time Only! Save Over 70%	Signature Collection Shimmer Mist Moonlight Path \$14.00 Now \$4.00 Limited Time Only! Save Over 70%	Signature Collection Shower Gel Exotic Coconut \$14.00 Now \$2.75 Special Savings - Save over 60%	Signature Collection Shower Gel Cotton Blossom \$14.00 Now \$2.75 Special Savings - Save over 60%
Qty: 1 Add to Bag	Qty: 1 Add to Bag	Qty: 1 Add to Bag	Qty: 1 Add to Bag

TOTAL

Subtotal: \$12.95
Shipping: \$6.95
Total: \$19.9



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Payment details

The total amount that will be debited to your credit card is \$100.36 for 52 weeks, plus \$10.00 for the tip, for a total amount of \$110.36

Total Cats in Household

Share the number of cats in your household and earn 100 points!

How many cats are in your household?

- ☐ 1
- ☒ 2
- ☒ 3
- ☐ 4
- ☐ 5+

Submit >

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***IFNAME* enter to win \$10k for your charity today with our Favorites Givea...**

Invalid SQLExec update for this type of PeopleCode program. (2,146) NY_SNDEMAIL_WRK.SENDMAILFIELD.FieldFormula
 Name:validatePIN_PCPC:15071 Statement:181
 Called from:SUP_OB_USR_SUP_OB_VENDOR_ID.FieldChange Name:Check_Std_Id_Num Statement:38
 Called from:SUP_OB_VND_WRK.STD_ID_NUM.FieldEdit Statement:18

SQLExec commands with UPDATE, INSERT, or DELETE statements are only allowed in SavePreChange, SavePostChange, and Workflow type PeopleCode programs.

☐ Prevent this page from creating additional dialogs


500 Internal Server Error

Sorry, something went wrong.

A team of highly trained monkeys has been dispatched to deal with this situation.

If you see them, send them this information as text (screenshots frighten them):

APCG7o5yKoeBOW-fKRNIS1hLwGgo-1t03YV47N3-dyKwXjKTHYR2
 m1DXuGB589DmVUN5GqUactxdVkvRnBFAOjfydq_5BANH01k6-KML55
 aev_MYUUr528MC_XL7baMEKdC8V2eLpy7a_dj1LCL08100YuSg8IAAM
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 f3qu4FgaJTK0M0_g5H1BKVVAJYDywp2-ownIK8BAMH9S9R8ROCKaa0M
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 xZm2m92J5Qv2L1T8-9ehvS2fYLa61Yt--HYE3PM_ChpulCV7KMFXTWj
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 KQK6a08_gVpV9F20mBYa-XYMukEhB058Jb5x-X8xvCpl0a2XP2q25
 1tqd730Nzdkyfh1JGAJfKo1FCYyKm_2J0Jf0dJ7f0q7e7haig5gAuyCKTU
 IOB8V0COFFTAfIa8e1kAL62k5Px63uzK4VU0zYbv2FF1BacK43qTtpY
 YhC844w0010yo--m1Vq1t4L2odumKYr3be0v1BwGsh17AkdDp28M1
 BYSxBLIX4euU3QVY_t_jPPVU0r11MpnkTtaLaqPXME7TVCaF4-XA2zh
 nND9fjU3004dFT8V55yFdp3JbujdW1eu20jakgKcBapyzj8BpE16gRyr
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PPTX bug

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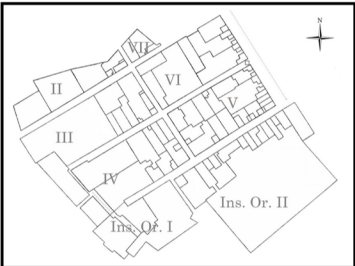
Digital Humanities

AGP Browse Interactive Maps Featured Graffiti Resources About the Project Search for Graffiti Search

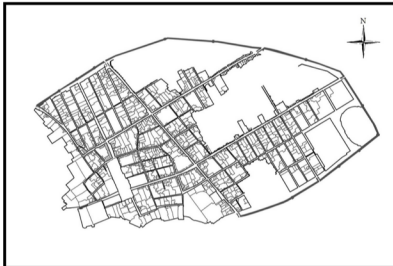
The Ancient Graffiti Project

A digital resource for studying the graffiti of Herculaneum and Pompeii

Herculaneum



Pompeii



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Symbolic Logic Tutorial

[Home](#)
[Practice Exercises](#)
[Quizzes](#)
[Statistics](#)
[Change Password](#)
[Log Out](#)
[Help](#)

Practice Mode

Make the sentences into math

Key:

A: Apples are yummy.

B: I will eat apples.

Sentence 1 of 1: If apples are yummy, then I will not eat apples.

Points Possible: 3

Unanswered

Answer:

Use & or the caret (^) for "and", | for "or", ~ for "not", -> for "conditional", and <-> for "biconditional"

^

v

~

->

<->

(

)

SUBMIT

CLEAR

REVIEW ANSWERS

Jan

17

MEET SOME MORE COMPUTER SCIENTISTS

Jamie White '17



Software Engineer at
Amazon, eBook division

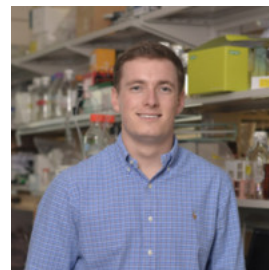


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Patrick Ozark '17



Senior Bioinformatician at Northwestern University –
the Feinberg School of Medicine

Promoted after 15 months as Bioinformatics Analyst

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Lex McGriff '18

- Technology Analyst with Citi, in Jacksonville, FL



- Interned with J.P. Morgan Chase




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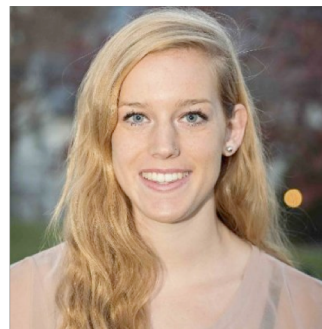
Johanna Goergen '16

Software engineer at
 Optimizely,
a startup in San Francisco



Optimizely: A/B testing and personalization

Johanna: on the application backend team, writing and maintaining the company's REST API



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Haley Archer-McClellan '15

Computer Applications Programmer/Analyst
IT division, Federal Reserve Board



- Focus: web app that tracks Freedom of Information Act (FOIA) requests received by the board
 - meeting with the team that uses that app
 - developing requirements
 - monitoring legislation that impacts the Freedom of Information Act and our client's business processes
 - developing and testing our app

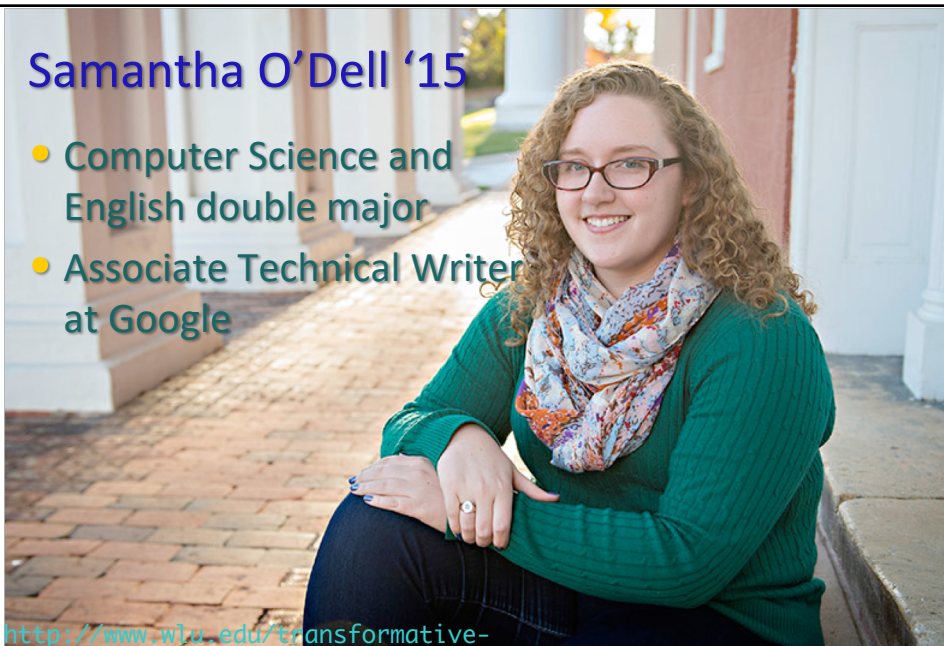
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Samantha O'Dell '15

- Computer Science and English double major
- Associate Technical Writer at Google



<http://www.wlu.edu/transformational-education?feature=true&id=x10977>

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Lucy Simko McGee '11 and Camille Cobb '12

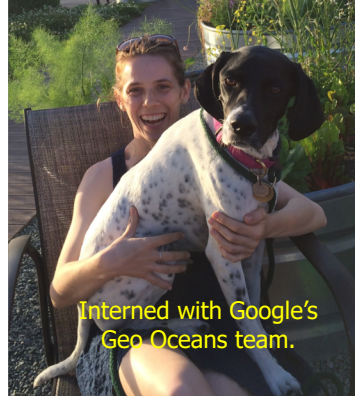


SECURITY AND PRIVACY RESEARCH LAB



Worked for the Dept of
Defense on Cybersecurity

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Interned with Google's
Geo Oceans team.

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Christyann Pulliam



- Double major in CS and **Political Science** from Gettysburg College
- **Law Degree** from Wake Forest University
- Patent Examiner at the US Patent and Trademark Office
 - Focus: Search engines, DB apps

Julianne Campbell '18 is at
Vanderbilt University Law School
for IP Law

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Erich Geist food banks

We use data analytics, computer systems, servers, programming, network and database administration all the time to provide the data necessary to inform our donors, government officials, advocates, and the general public about our mission to feed the hungry.

Without good computer science...there is no food.

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Your Bios

- Where you're from
- Your year
- A fun fact

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Hilary Mason



- Founder of Fast Forward Labs
 - a machine intelligence research company
- Formerly Chief Scientist at bitly.
- “Teaching someone to program is like giving them a **superpower**.” quote in *Glamour*, November 2011

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What This Course Is About

Problem Solving!



From
30 Rock

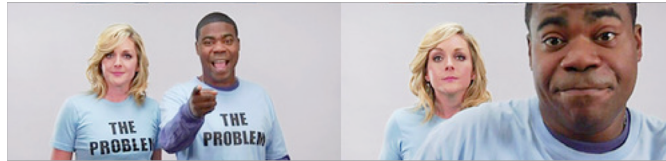
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Computational Problem Solving 101

- **Computational Problem:**
A problem that can be solved by logic
- To solve the problem:
 1. Create a **model** of the problem
 2. Design an **algorithm** for solving the problem using the model
 3. Write a **program** that *implements* the algorithm



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Computational Problem Solving 101

- **Algorithm:** a well-defined recipe for solving a problem
 - Has a *finite* number of steps
 - Completes in a *finite* amount of time
- **Program**
 - An algorithm written in a **programming language**
 - Also called *code*
 - As code base grows, becomes an *application*

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What to Expect from this Class

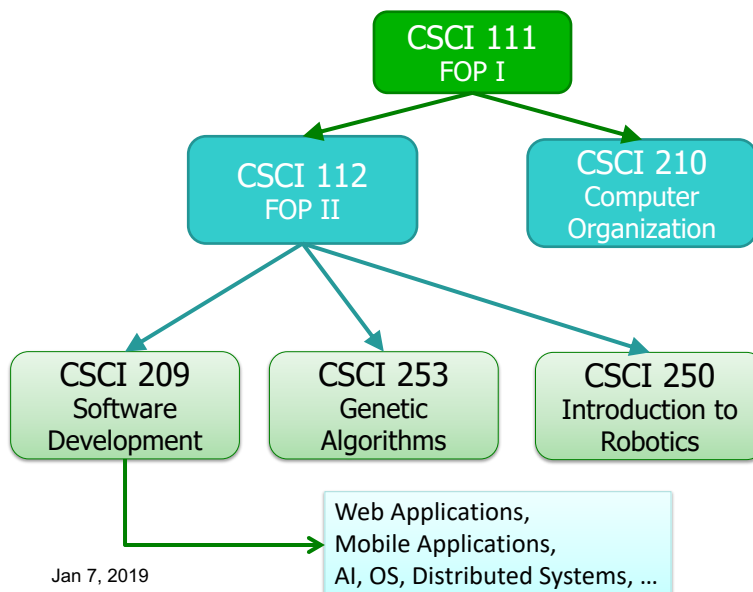
- First programming course
- Lots to learn!
 - Introductions to a lot of new ideas
- Different way of thinking
 - Similar yet different from math
 - May get stuck but ask for help!
- Writing some basic programs
 - Foundations for more complex, sophisticated code
- Great power, great responsibility

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Where You Can Go From Here



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Class Details

- Course web page
 - <http://www.cs.wlu.edu/~sprenkle/cs111>
 - Check schedule frequently for updates
- Monday, Wednesday, Friday lectures
 - Slides posted after class, in PDF format
 - Don't copy down slides verbatim
 - A lot isn't on the slides
 - Use PDF slides later to review
- Tuesday labs
 - "Pre-lab" assignments in the textbook
 - Programming projects due on Friday

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Class Details

- 3 Exams
 - 2 Exams (see schedule online for dates)
 - Final Exam
- Discussion of broader issues in CS
 - Articles about computer science's effect on *everything*
 - Get big picture of CS
 - Write up on Sakai, due Fridays by 11 a.m.
 - Discussion Friday
 - Opportunities for extra credit for finding, reading, summarizing additional articles

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Instructor Responsibilities

- Keep your interest in CS
- Prompt, constructive feedback on assignments
- Office hours:
 - Wednesday 2:30 – 5 p.m., Thursday: 2:30-5 p.m.
 - Email for appointments
- Respond within 24 hours to emailed questions

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Student Responsibilities

- Check W&L email and course web page frequently for updates
 - Review entire syllabus online
- Attend and participate in class and lecture
 - Mandatory attendance
 - Be respectful to other students
- Arrive promptly to lecture/lab
 - Bring your notes and handouts
- Turn off cell phone
- **Be patient, flexible, and learn from mistakes**

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Textbook

- Online textbook
- Supplement to the material
 - Different perspective, additional practice problems
- Register for the class (instructions on course schedule page)

Consequence: my lecture slides and handouts and your notes are vitally important

- Reference *frequently*
- **Bring with you to lab!**

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Your TODO List

- Review the course web page and syllabus
 - Schedule (may change)
- Complete the survey and submit to me tomorrow

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Summary

- Meet & greet
- What is computer science?
- What is this class?