

MA/CSSE 473

Day 01

Course Intro
Algorithms
Intro



MA/CSSE 473 Day 01

- Student/Instructor Intro
- Questions about the Syllabus?
- The need for grader(s)
- Daily Quizzes
- The importance of Data Structures
- The importance of Algorithms
- Begin Algorithm Overview/Review
 - Which will last a few days



Student Intros

- Your name (what you want people to call you)?
- What is the main thing you did this summer?
 - Where were you?
 - What was your role?
 - For whom?
 - What specifically did you work on?
 - What did you learn?
 - What was the main value that you added there?
 - Were you helped by something from Rose courses/experiences?
 - Good tools that you used?
 - What was the environment like?
 - Would you recommend this place to your peers?
- Other interesting summer activities?
- A favorite algorithm?



A Few Claude Facts

- Degrees: Caltech, Illinois, Indiana (MA, MA, CS)
- This is my 21st year at Rose
- Have taught about 20 different courses; favorites are ...
- I have a large family (9 children, ages 6-26)
- I have a one-year-old grandchild
- I live **very** close to campus
- In 2008, much of my energy has been devoted to the start-up of a new non-denominational, multi-ethnic church in Terre Haute's "inner city"
- I went whitewater rafting for the first time this summer.



Questions about the Syllabus?

- You can ask now, or ask tomorrow
- The Grader situation
 - The downside
- A possible remedy
 - How would you feel about it?
 - Would you want to do it?
 - Precedents at Rose?
 - Did it work?



A quick look at some course materials

- ANGEL
- Schedule page
- Notice the **Hints to Exercises** section that begins on p 497 of the textbook
 - First try to do each problem without using the hint.
 - But if you get stuck, by all means look at the hint.
- Usually I prefer to post my PowerPoint slides *after* each lecture.



The Ideal and the Real

- Ideal
 - Everyone comes to this course with the material from CSSE 230 and MA 375 fresh in their minds
- Real
 - Fewer than 1/3 of you took 230 during the 07-08 year
- We'll do quite a bit of review/reinforcement in this course
 - In many cases, you'll understand things much better the second time you see them
 - The background survey will help me to see what you think you remember, and to plan how much review to include in this course
 - The survey is not quite ready. Should be ready at about 10:00. I'll send you an email
- A significant portion of the early reading assignments talks about things you have seen before
 - Sometimes at a higher level



What were they thinking?

- A theoretical class for Juniors and Seniors at 8 AM?
- Hmmmm ...
- We have to make the best of it



Daily “Quizzes”

- Mark Ardis’ legacy to our department
- Mainly a Note-taking device
- May be especially helpful at 8 AM!
- Also feedback for me on whether students “get it”
- Will not have one every day.
- For example, none today, since we will not discuss much technical material.



Structuring Data Can Help a Lot

- If you have seen this problem before, please don't speak up (so others get a chance to think about it).
- Example is [here](#).
(Note: I am not putting the example on-line)



Algorithms are Important

- The next few slides are based on Chapter 0 of *Algorithms* by Dasgupta, Papadimitriou, and Vazirani (McGraw-Hill, 2008)
- Two enterprises have fueled the computer revolution:
 - Rapidly-increasing hardware speeds
 - Efficient Algorithms



A Big Idea That Changed the World

- Moveable type
 - Gutenberg, 1448 (I saw a Gutenberg Bible this summer at the Library of Congress)
 - According to Dasgupta, et. al
 - Literacy spread
 - The Dark Ages ended
 - The human intellect was liberated
 - Science and technology triumphed
 - The Industrial Revolution happened
 - Many historians say we owe all of this to typography
 - For a great discussion of algorithms and typography
 - See the interview with Donald Knuth in July-August CACM
 - It's assigned reading for this course.



The Other Earth-Shaking Big Idea

- **Algorithms**
- First step: Replacing Roman Numerals by decimals (India, 7th century AD)
- Could now do arithmetic efficiently
- Codified by Al Khwarizimi (Baghdad, 9th cent.)
 - Add, subtract, multiply, divide, square roots, digits of π .
 - Precise, unambiguous, mechanical
 - The word “algorithm” is derived from his name.
- The champion of algorithms in the West
 - Leonardo of Pisa (aka Fibonacci) (early 13th century)



Do you agree with Sengupta?

- Are moveable type and algorithms the biggest change motivators since the Dark Ages?
- What else would you include in the list?

