CMSC201
Computer Science I for Majors

Lecture 0X - Careers
Today’s Objectives

• To introduce careers in Computer Science

• To explore using Computer Science with other fields (interdisciplinary)

• Talk a little bit about grad school
Careers in STEM Fields
What is STEM?

• STEM is an acronym referring to the academic disciplines of:
  – Science,
  – Technology,
  – Engineering, and
  – Mathematics
STEM Job Market (2013)

- 5.7 million total postings in STEM fields

- 4.4 million (76%) require at least a bachelor’s degree

- 2.3 million (41%) are entry-level jobs
  - Requiring less than 2 years of experience

[Link: http://burning-glass.com/research/stem/]
STEM Jobs by Career Area

- Healthcare: 42% of STEM Postings, 2,451,513 Job Postings
- Information Technology: 37% of STEM Postings, 2,201,570 Job Postings
- Engineering & Advanced Manufacturing: 14% of STEM Postings, 829,567 Job Postings
- Analysts (Math): 4% of STEM Postings, 216,760 Job Postings
- Sciences: 3% of STEM Postings, 187,857 Job Postings

Degree Level: % of Openings Per Category That Require a BA or Higher
Demand for STEM Graduates

• 48% of all entry-level jobs requiring a bachelor’s degree or higher are in STEM fields
  – Only 29% of bachelor’s degrees are in a STEM field

• There are 2.5 entry-level job postings for each new 4-year graduate in STEM fields
  – Compared to 1.1 postings for each new graduate in non-STEM fields

http://burning-glass.com/research/stem/
Demand is Only Growing

1,000,000 more jobs than students by 2020

$500 billion opportunity

1.4 million computing jobs

400,000 computer science students

Computer science is a top paying college degree and computer programming jobs are growing at 2X the national average.

http://newsroom.unl.edu/announce/cse/3727/20691
Interdisciplinary Computer Science
Learning to Program is for Everyone

• In the Lost Interview with Steve Jobs, he said:

“I think everybody in this country should learn how to program a computer because it teaches you how to think.”
Computer Science and Biology

• Human Genome Project
• Tagging and tracking animals
• Protein folding
Computer Science and Film

- Animated films
- Motion capture
- CG special effects
Computer Science and Healthcare

• Pharmaceutical manufacturing
• Predictive diagnostics
• Chemotherapy machines
Computer Science and Space

• Analyzing data from spacecraft
• Planning the Mars mission
• Programming landers, shuttles, etc.
Computer Science and MechE

- Google’s self-driving car
- Automated factories
- Robots!
(More Robots)

- Robot bloopers:
  
  https://www.youtube.com/watch?v=g0TaYhjpOfo
Computer Science and Finance

- High-frequency trading
- Computational finance
- Risk analysis
Grad School
Why (or Why Not) Grad School?

- Reflect – think about your education so far
  - What are your passions?
  - What are your goals in life?
  - What excites you?
  - What lifestyles might you want?

- Avoid listening to what others tell you to do; think about what you want
Why (or Why Not) Grad School?

- An **MS** is basically a technical degree that gives you more interesting job opportunities.
- A **PhD** is basically a research degree, which opens up a host of advanced and research-oriented opportunities.
- In industry, MS and PhDs are often a ticket to eventual upper-level management.
How Long is Grad School?

• MS
  – 1 to 2 years is typical

• PhD
  – 4 to 6 years is typical
  – It can take longer! (8 years or more)
    • Many schools have a limit to how long you can take
What Is It Good For?

• MS is essentially a technical degree
  – Open up a range of much more interesting jobs
  – More responsibility, creativity, flexibility, and income

• PhD is basically a research degree
  – Research today is collaborative (interdisciplinary!)
  – No “lonely hacker toiling away alone in the night”
  – Many become professors and also teach classes
What Most Schools Don’t Teach
Announcements

• Labs will meet in person starting next week

• Lab 1 is due by Thursday night

• Homework 0 is out now
  – Not “worth” points, but important material

• Next Class: Variables