CS 553:
Cloud Computing

Syllabus

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Computer Science Department
Illinois Institute of Technology

Introductions

- **Class**
  - Monday/Wednesday 11:25AM-12:40PM
  - Stuart Building 113
- **Professor: Ioan Raicu** <iraicu@illinoistech.edu>
  - Office Hours Time: Wednesday 12:50PM-1:50PM SB226B
  - More Information:
    - http://www.cs.iit.edu/~iraicu/
    - http://datasys.cs.iit.edu/
- **TAs**
  - **Lan Nguyen (lnguyen18@hawk.illinoistech.edu)**
    - **Office Hours: Monday/Thursday 12:50PM-1:50PM in SB007E**

Ioan

Lan

Course Overview

- This course is a tour through various topics and technologies related to Cloud Computing
- Explore solutions and learn design principles for building large network-based systems, to support compute and data intensive computing across geographically distributed infrastructures
- Discussions often grounded in real Cloud Computing systems:
  - Amazon AWS (EC2, S3, SQS), Microsoft Azure, Google AppEngine, OpenStack, Google's MapReduce, Yahoo's Hadoop, Spark, etc

Course Overview (cont)

- Understand methods and approaches to:
  - Design, implement, and evaluate cloud computing systems
- Course involves:
  - Lectures, outside invited speakers, programming assignments, written homeworks, and exams
- Prerequisites:
  - Required: CS450 (Operating Systems) or CS455 (Data Communication)
  - Helpful: CS451, CS542, CS546, CS550, CS551, CS554, CS562, and CS570
- Required texts:
  - Cloud Computing for Science and Engineering, by Ian Foster and Dennis B. Gannon. ISBN: 9780262037242

Course Topics

- Distributed System Models
- Parallel Computing
- Cloud Platform Architectures
- Cloud Programming
- Performance Evaluations
- Storage
- Virtualization
- Hot topics: AI & Blockchains

Assignments

- 8 total assignments
  - Assignments in groups of up to 2
  - 5%~10% of overall grade each
  - 1~2 weeks to complete each
  - Written homework
    - Will help with theoretical aspects of cloud computing
  - Programming assignments
    - Will help with practical aspects of cloud computing
    - Expected to know (or learn quickly) some of these languages and systems: Linux, Virtual Machines, Amazon AWS, Hadoop, Spark, multi-threading, sockets, C/C++, Java, Python, Bash, GIT

Assignments (examples)

- Linux (5%)
- Containers & Virtual Machines (5%)
- Benchmarking (10%)
- Cost of Cloud Computing (10%)
- External Sort – Single Node (10%)
- External Sort – Multi Node (10%)
- Storage (10%)
- Scheduling (10%)

Online Materials

- Materials will be posted on Canvas
  - Assignments
  - Slides
  - Reading assignments
- Assignment submissions
  - GIT
  - Canvas

Cheating will not be tolerated

- MOSS: Measure Of Software Similarity
  https://theory.stanford.edu/~aiken/moss/
- Automatic system for determining the similarity of programs
  - We will compare to past submissions dating back to 2011
- Supports many languages:
  - C, C++, Java, C#, Python, Visual Basic, Javascript, FORTRAN, ML, Haskell, Lisp, Scheme, Pascal, Modula2, Ada, Perl, TCL, Matlab, VHDL, Verilog, Spice, MIPS assembly, a8086 assembly, a8086 assembly, MIPS assembly, HCL2
- **You will receive a 0 on assignment; extremely serious offences will fail the course**

MOSS Plagiarism Detection

Moss Results

Tue Sep 8 23:29:31 PDT 2015

Options -l python -d -m 10

[How to Read the Results | Tips | FAQ | Contact | Submission Scripts | Credits]

File 1	File 2	Lines Matched
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MOSS Plagiarism Detection

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74-91		69-86	
115-132		110-127	

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```
>>>> file: LongJump.py
#S[redacted]a

print("***** Long Jump Information System *****")
print("Please enter the names of competitors. (Press return when done.)")
print("Competitor no. 1:")
competitor = input()
b,c,g,h,d,k = 1,0,0,0,[],0
maxi,competitors = [],[competitor]
while True:
    b += 1
    print("Competitor no. "+str(b)+":")
    competitor = input()
    if competitor == "":break
    else:
        competitors.append(competitor)
print("Please enter the distances for each competitor.")
for each in competitors:
    print("Competitor " each ":" sep="")
    at1 = input("Attempt 1:\n")
    at2 = input("Attempt 2:\n")
    at3 = input("Attempt 3:\n")
    x = (at1+at2+at3).lower()
    if (at1+at2+at3).find("oul") != -1:
        x = (at1+at2+at3).lower()
    d.append(at1)
    d.append(at2)
    d.append(at3)
    if x.find("foul") == -1:
        maxi.append(max(eval(at1),eval(at2),eval(at3)))
```

/home/ubuntu/Projects/work/2015/uct-csc1010h/tutorials/4/raw/[redacted]

```
>>>> file: LongJump.py

print("***** Long Jump Information System *****")
print("Please enter the names of competitors. (Press return when done.)")
print("Competitor no. 1:")
competitor = input()
b,c,g,h,d,k = 1,0,0,0,[],0
maximums,competitors = [],[competitor]
while True:
    b += 1
    print("Competitor no. "+str(b)+":")
    competitor = input()
    if competitor == "":break
    else:
        competitors.append(competitor)
print("Please enter the distances for each competitor.")
for each in competitors:
    print("Competitor " each ":" sep="")
    attempt1 = input("Attempt 1:\n")
    attempt2 = input("Attempt 2:\n")
    attempt3 = input("Attempt 3:\n")
    g = (attempt1+attempt2+attempt3).lower()
    if (attempt1+attempt2+attempt3).find("oul") != -1:
        g = (attempt1+attempt2+attempt3).lower()
    d.append(attempt1)
    d.append(attempt2)
    d.append(attempt3)
    if g.find("foul") == -1:
        maximums.append(max(eval(attempt1),eval(attempt2),eval(attempt3)))
    else:
        d.remove("foul")
    if not "foul" in d:
```

Exams

- 1 Final Exam
- The exam will be individual
  - Closed book and closed notes
  - The exam is worth 30% of the final grade
- Schedule:
  - Exam will take place during the last lecture of the semester on Wednesday December 3rd, 2025, from 11:25am to 1:25pm
- **There will be no makeup exam**

Late Policy

- Assignments will be due at 11:59PM on the date they are due; there will be a 15-minute grace period
- Late assignments will be penalized 20%
- Late assignments by more than 24 hours will receive 0 points
- Exams: There will not be any makeup exams; do not miss the exam or you will get a 0, and fail the class

Grading

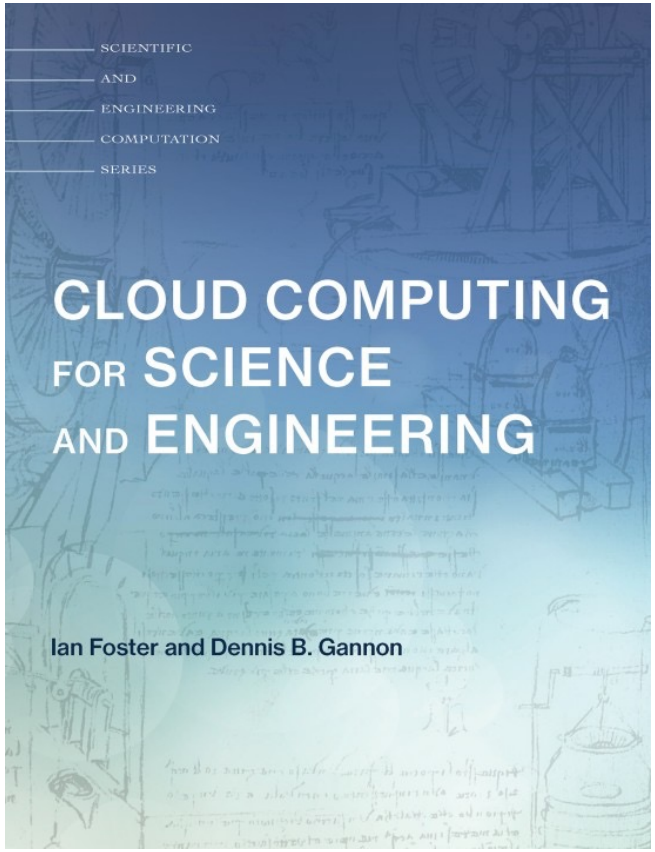
- Breakdown:
  - Assignments (8): 70%
  - Exam (1): 30% -- NO MAKEUPS
- Scale (graduate students):
  - **A:** 85% ~ 100%
  - **B:** 70% ~ 84% ➔ class average
  - **C:** 60% ~ 69%
  - **E:** 0% ~ 49%

Grading (undergrads)

- Scale:
  - **A:** 85% ~ 100%
  - **B:** 70% ~ 84%
  - **C:** 60% ~ 69%
  - **D:** 50% ~ 59%
  - **E:** 0% ~ 49%

Required texts

- We will be using the textbook Cloud Computing for Science and Engineering, by Ian Foster and Dennis B. Gannon (ISBN: 9780262037242).



Important Dates

- Friday 08/26 (Last day to add/drop)
- Monday 09/01 (NO CLASS)
- Friday 09/05 (makeup class for 09/01)
- Monday 10/13 (NO CLASS)
- Wednesday 11/26 (NO CLASS)
- Wednesday 12/03 (Final Exam)
- Wednesday 12/17 (grades due)

Questions

- Write me:
  - iraicu@illinoistech.edu
- Visit me in office hours (SB226B)