CS211: Computer Architecture

Summer 2020

Instructors and TAs

- Instructor:
  - David Domingo
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    - Office Hours: Fridays 2pm-3pm
- Teaching Assistants:
  - Yujie Ren
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  - Shaleen Garg
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    - Office Hours: Thursdays 11am-12pm
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    - Office Hours: Thursdays 2pm-3pm

Course Logistics

- Sakai will be the primary source of course information
  - https://sakai.rutgers.edu
  - Announcements, course material, assignments, etc.
- Lectures
  - Held synchronously online via Sakai Meetings
  - Slides will be uploaded after lecture
  - Lectures will be recorded and available*
- Office Hours
  - Held online via Sakai Meetings
- Piazza
  - Main forum for questions and discussion on lecture materials and assignments.

Textbooks

- Required
  - **Computer Systems: A Programmer's Perspective**, by R.E.Bryant and D.R.O'Hallaron
- Recommended:
  - **Computer Organization and Design: The Hardware/Software Interface** by D.A.Patterson and J.L.Hennessy
  - **The C Programming Language** by B.W.Kernighan and D.M.Ritchie
  - Any book about C similar to (https://publications.gbdirect.co.uk/c_book/)

What You Should Know

- Prerequisite: CS 112 Data Structures
- Programming Languages
- Algorithms
- Data Structures
- Basics of how to write, run, and test programs

Goal

- Understand how programs run on hardware
- Write programs with good performance on modern architecture computers.

What you will learn

- How to program in C and Assembly
- The major hardware components in computer systems
- Trends in technology and computer architecture
- How hardware components are built from digital logic
- How programs written in a high-level language (e.g., C) is actually executed by the hardware
- How to understand and improve the performance of programs

Course Expectations

- Fun part:
  - 3+ Projects (programming assignments)
- Not So Fun Part:
  - 1 Midterm and 1 Final*
- What we expect from you
  - Attend Lectures
  - Ask Questions
  - Ask for help if you feel lost
  - Start programming assignments early
  - Do not copy or cheat

No Late Assignments

- We will not accept late assignments
- Emails with assignment attach will be discarded
- Assignments must be handed-in on Sakai
  - Deadline enforces by Sakai
  - Can submit unlimited number of times

Collaboration vs. Cheating

- Collaboration is encouraged!
  - Learn by discussing and helping each other
  - But, you must not cheat and copy
- Cheating will not be tolerated
  - We will look for cheating
  - Once, found everyone involved will be punished
  - https://www.cs.rutgers.edu/academics/undergraduate/academic-integrity-policy
- If you having any trouble with the course seek help
  - Email me or the TAs

List of topics

- Hardware trends
- C programming
- Data representation
- Assembly program
- Memory Hierarchy/Caching
- Digital Logic

Programming Assignments

- 3 Programming Assignments
- Program in C and/or Assembly
  - Start early, do not wait until the last minute
- Programming and Grading done using iLab Machines
  - https://resources.cs.rutgers.edu/docs/instructional-lab/
  - Sign up for account if you haven't already https://services.cs.rutgers.edu/accounts/
  - Programming in Linux Environment

Grading

- Grading:
  - 45%: Programming Assignments
  - 20%: Midterm
  - 30%: Final Exam
  - 5%: Class Participation
    - Asking Questions in Class
    - Asking/answering questions in Piazza
  - All exams are cumulative
  - No make-up exams except for university sanctioned reasons
    - Must inform me before the exam

Tentative Schedule

- June 22nd – July 1st : C Programming
- July 6th : Data Representation
- July 8th – July 20th : Assembly Language
- July 22nd : Midterm
- July 29 : Memory Hierarchy/Cache
- July 31st – August 10 : Digital Logic
- August 12th : Final Exam