Welcome to CSE2003: System Programming

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Introduction

- **Time & Location**
  - 12:00 – 13:15 (Mon), 15:00 – 16:15 (Wed)
  - Lecture room #330110 (Semiconductor Bldg.)

- **Instructor**
  - Jin-Soo Kim ([jinsoookim@skku.edu](mailto:jinsoookim@skku.edu))
  - Computer Systems Laboratory ([http://csl.skku.edu](http://csl.skku.edu))
  - Office: Semiconductor Bldg. #400630 (6th floor)
  - Tel: 031-299-4593
  - The best way to contact me is by email.
What is “System Programming”?

- Low-level programming?
- Learning about system programs?
- Assembly programming?
- Programming with operating system services?

We try to answer the following questions:

- How does the computer system work?
- How does your program run?
- How to make your program run faster?
- How to make your program more robust?
Course Outline (2)

- Computer systems
Course Outline (3)

- Computer systems internals

Software

Architecture

Hardware

Operating Systems

CPU

Mem

I/O Devices
## Levels of abstraction

<table>
<thead>
<tr>
<th>Application programs</th>
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<tr>
<td>Data structures &amp; algorithms</td>
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<tr>
<td>Programming languages &amp; compilers</td>
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<tr>
<td>Operating System</td>
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<td>Architecture</td>
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<td>Microarchitecture</td>
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<td>Hardware Description Languages</td>
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<td>Digital logic</td>
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<tr>
<td>VLSI layout</td>
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<tr>
<td>Processing, Fabrication</td>
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<tr>
<td>Chemistry, Physics</td>
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“System” programming
- Representing and manipulating information
- Assembly languages
- Processor architecture
- Memory hierarchy
- Compilers, linkers, and loaders
- Operating systems
- Performance optimization

System “programming”
- Assembly programming
Computer Systems Track

ICE3028: Embedded System Design
ICE3026: Embedded Systems
ICE3001: Microprocessor
CSE3023: Compilers
CSE3007: Database
ICE3026: Computer Networks
ICE3024: Digital Systems
CSE3039: Programming Languages
CSE3008: Operating Systems
ICE3003: Computer Architectures
ICE2003: System Programming
GEDD007: Programming
ICE2002: Data Structures
ICE2001: Logic Circuits

Advanced / Interdisciplinary
Core
Fundamental

= Introduction to Computer Systems

CSE2003: System Programming | Spring 2009 | Jin-Soo Kim (jinsookim@skku.edu)
Prerequisites

- C programming skills (GEDD07)
- Basic knowledge of UNIX/Linux systems

- ICE2001: Logic circuits
- ICE2002: Data structures
Course Components

- **Lectures**
  - Concepts
  - Backgrounds

- **Quizzes**
  - On topics covered in previous classes

- **Projects**
  - Mostly on assembly programming
  - Design, implementation, measurement, optimization
Computer Systems:
A Programmer’s Perspective


- Authors’ homepage: http://csapp.cs.cmu.edu
References (1)

- **C Programming**
  - *C Programming Language*, (Second Edition)
References (2)

- **Assembly Programming**
  - *The Art of Assembly Language Programming*, Randall Hyde,
    
    http://webster.cs.ucr.edu/
  
    • Intel Architectures Software Developer’s Manual,
      
      Volume 1: Basic Architecture
      Volume 2: Instruction Set Reference
      Volume 3: System Programming Guide

Grading

- **Policy (subject to change)**
  - Class attendance (10%)
  - Projects (25%)
  - Exams (35%)
  - Quizzes (30%)

- **TAs**
  - TBD

- **Course homepage**
Class Attendance

- **Policy**
  - The seat you select for the first class of each month will be your assigned seat for the rest of the month.
  - Do not be late! You should be present when I check for class attendance.
  - You have two free “tokens”. But, please be aware that we may have a quiz from time to time.
Cheating

• What is cheating?
  – Sharing code: either by copying, retyping, looking at, or supplying a copy of a file.

• What is NOT cheating?
  – Helping others use systems or tools.
  – Helping others with high-level design issues.
  – Helping others debug their code.

• Penalty for cheating:
  – Anyone who involved in cheating will fail this course and get disciplinary actions from the University.

• Ask helps to me or TAs if you experience any difficulty!
Any Questions?