4190.308
Computer Architecture

Course Syllabus and Organization

CSE 컴퓨터공학부
Department of Computer Science & Engineering

Teaching Staff

- **Instructor** Bernhard Egger

  Office Hours Tuesdays, 0900 – 1200 in 301–403
  Email comparch-instr@csap.snu.ac.kr

- **TAs** Changyeon Jo
  Daeyong Shin
  Chanseok Kang

  Email comparch-ta@csap.snu.ac.kr



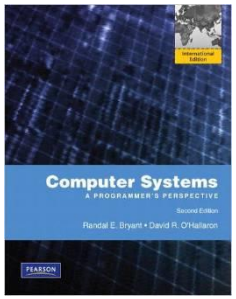
Course Organization

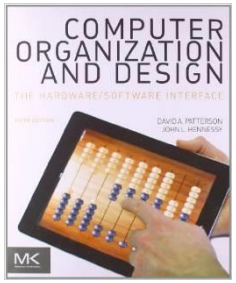
- **Class** Tuesdays, Thursdays 15:30 – 16:45 in room 302-107

  Materials on eTL
  http://etl.snu.ac.kr/course/view.php?id=78203

- **Textbooks** "Computer Systems – a Programmer's Perspective"
  Randal E. Bryant, David R. O'Hallaron
  2nd international edition, Pearson, 2011
  (must have)

  "Computer Organization and Design:
  The Hardware/Software Interface"
  David A. Patterson, John L. Hennessy
  5th edition, Morgan Kaufmann, 2013
  (for interested students)





Course Logistics

- **Communication**

eTL	the main channel of communication is through the course website on eTL. Check that site often and regularly! We consider all information posted on eTL read within three weekdays.
Email/SMS	in certain cases we may use eTL's email/SMS functionality to transmit important information to you. All emails/SMS sent to your email address/phone number are considered read within one weekday. → make sure that your email address/phone number in eTL are correct. While you're at it, please also upload a current picture.
Emails to Instructor/TA	use the course email (comparch-XXX@csap.snu.ac.kr). You can expect an answer within one weekday.

Course Components

- **Lecture + Recitation (복습; in Korean)**
  - higher level concepts
- **Homework Assignments**
  - every week
  - practice knowledge covered in class, small programming assignments
  - **prerequisite to participate in the exam**
- **Labs**
  - provide in-depth understanding of system aspects
  - larger programming assignments
- **Exams**
  - mid-term and final
  - test your understanding of computer architecture concepts & principles

Homework Assignments

- **No teamwork** — work alone on your homework assignments

- **Submission** — - paper handins: drop-off box in class and front of the CSAP lab (301-419)
  - electronic handins: per email to the TAs

- **Grading** — homework is checked, but not graded.

  Required number of submissions to participate in the
  - mid-term exam: 5
  - final exam: 5

- **Late Policy** — homework must be submitted by the deadline.
  Late submissions are not accepted

Lab Assignments

- **Teamwork** — unless stated otherwise, you must work alone on all assignments and labs
- **Submission** — follow the instructions in the assignment
- **Late Policy** — 5 grace days for the entire semester

  once grace days are used up, **20% penalty per day**

  Tip: don't spend them all on the first lab
- **Force Majeure** — serious illness, death in family, …

  talk to me to work out a plan how to get back on track

Cheating

- **Cheating is**
  - sharing code
  - copying code from somewhere (previous courses, Internet, …)
  - helping your friend to write an assignment/lab, line by line

- **Penalty for cheating**
  - removal from course with “F” mark
  - notification to department/university

- **If an assignment/lab is too hard for you**
  - ask a colleague to explain the concepts
  - send an email to the TAs and have them explain things

Exams

- **Two exams**
  - mid-term
  - final

- **Test your understanding of computer architecture concepts & principles**
  - blindly memorizing stuff will not help. A lot of the questions will be based on the homework and lab assignments.

- **Exam logistics**
  - 120 minutes
  - closed book
  - one A4 page (front + back) of *handwritten* notes (original, no copy) allowed

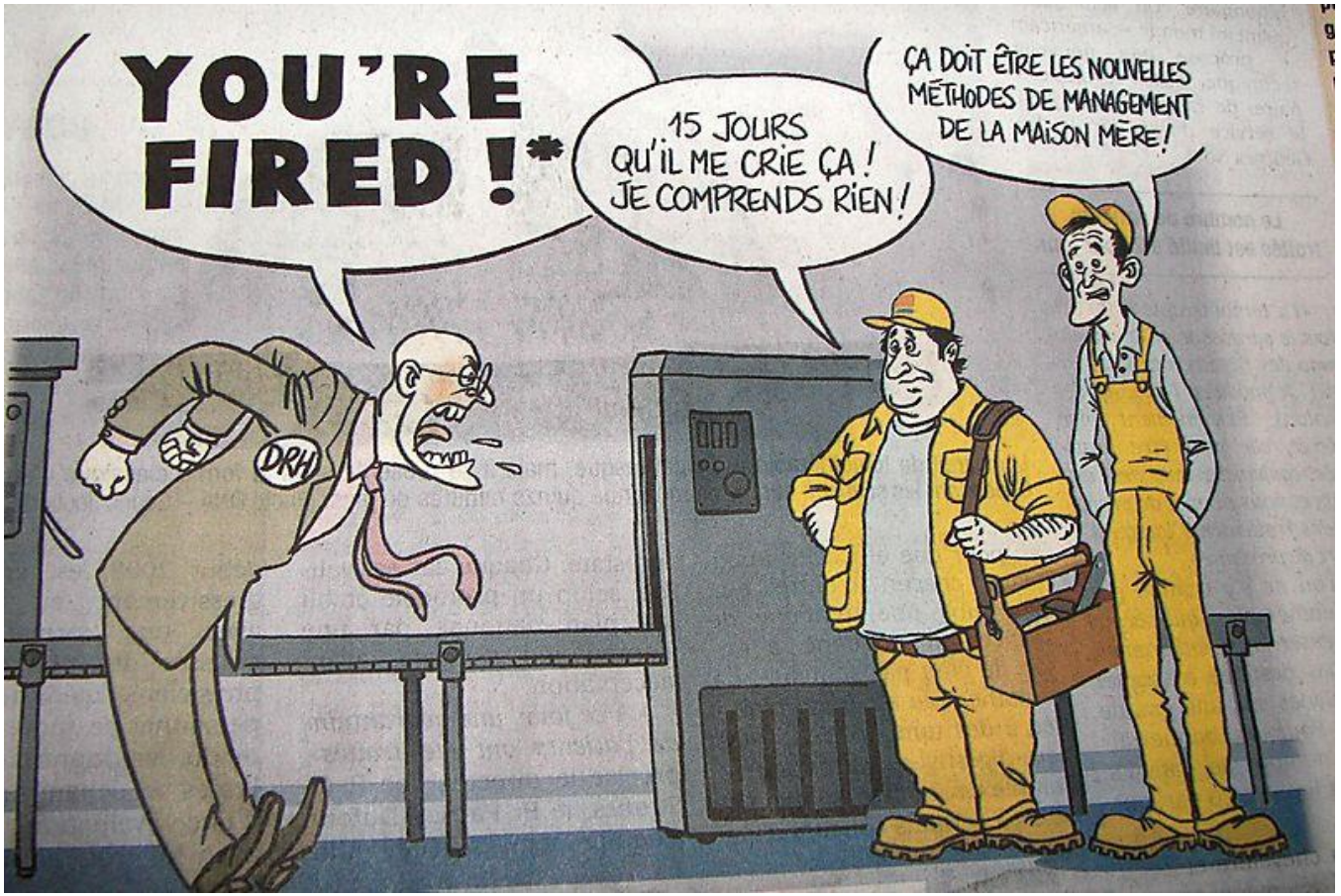
- **Again: you must submit five (5) homework assignments *in time* to participate in an exam (both for the mid-term and the final exam)**

Grading

- **Grading**

Homework assignments	prerequisite for exams
Labs	30%
Mid-term exam	30%
Final exam	35%
Attendance	5%
Participation	5%
Total	105%

Language



source: http://lost-tans.blogspot.com/

A Word of Advice

- **Computer Architecture is hard**
  - a tiny mistake/oversight can lead to incorrect behavior
- **Programming requires 20% talent, 30% knowledge, and 50% experience**
  - take every opportunity you have to gain experience (homework assignments, labs, your own ideas, …)
- **This course is hard and requires a lot of time/effort**
  - read the book *before* coming to class
  - unfortunately, I cannot read minds. Ask if you don't understand!
  - start the labs early and ask if you have difficulties

On the positive side: at the end of this class, you will understand how a CPU works and as an added benefit become a better programmer

Course Schedule

Week	Date	Lecture Topic	Project
1	09/02 (Tue) 09/04 (Thu)	Introduction to Computer Architecture The HW/SW Interface (ISA): Basic Operations	
2	09/09 (Tue) 09/11 (Thu)	추석 The HW/SW Interface (ISA): Arithmetic & Control	
3	09/16 (Tue) 09/18 (Thu)	The HW/SW Interface (ISA): Control flow structures The HW/SW Interface (ISA): Procedures and Calling Convention	
4	09/23 (Tue) 09/25 (Thu)	Processor Architecture: the Y86 Instruction Set Architecture Processor Architecture: Logic Design	Bomb Lab
5	09/30 (Tue) 10/02 (Thu)	Processor Architecture: Sequential Implementation	
6	10/07 (Tue) 10/09 (Thu)	Processor Architecture: Pipelining Basics 한글날	
7	10/14 (Tue) 10/06 (Thu)	Processor Architecture: Pipelined Implementation	
8	10/21 (Tue) 10/23 (Thu)	Wrap-up Mid-term examination	

This is a plan. No plan survives contact with reality.

Course Schedule

Week	Date	Lecture Topic	Project
9	10/28 (Tue) 10/30 (Thu)	The Memory Hierarchy: Introduction The Memory Hierarchy: Cache Memories	Processor Lab
10	11/04 (Tue) 11/06 (Thu)	The Memory Hierarchy: Virtual Memory – Concepts	
11	11/11 (Tue) 11/13 (Thu)	The Memory Hierarchy: Virtual Memory – Implementation	
12	11/18 (Tue) 11/20 (Thu)	Advanced Topics: Parallel Architectures	
13	11/25 (Tue) 11/27 (Thu)	Advanced Topics: Virtualization	Cache Lab
14	12/02 (Tue) 12/04 (Thu)	Advanced Topics: Modern Processor Architectures	
15	12/09 (Tue) 12/11 (Thu)	Final examination Exam discussion	
16	12/16 (Tue) 12/18 (Thu)	Make-up classes	

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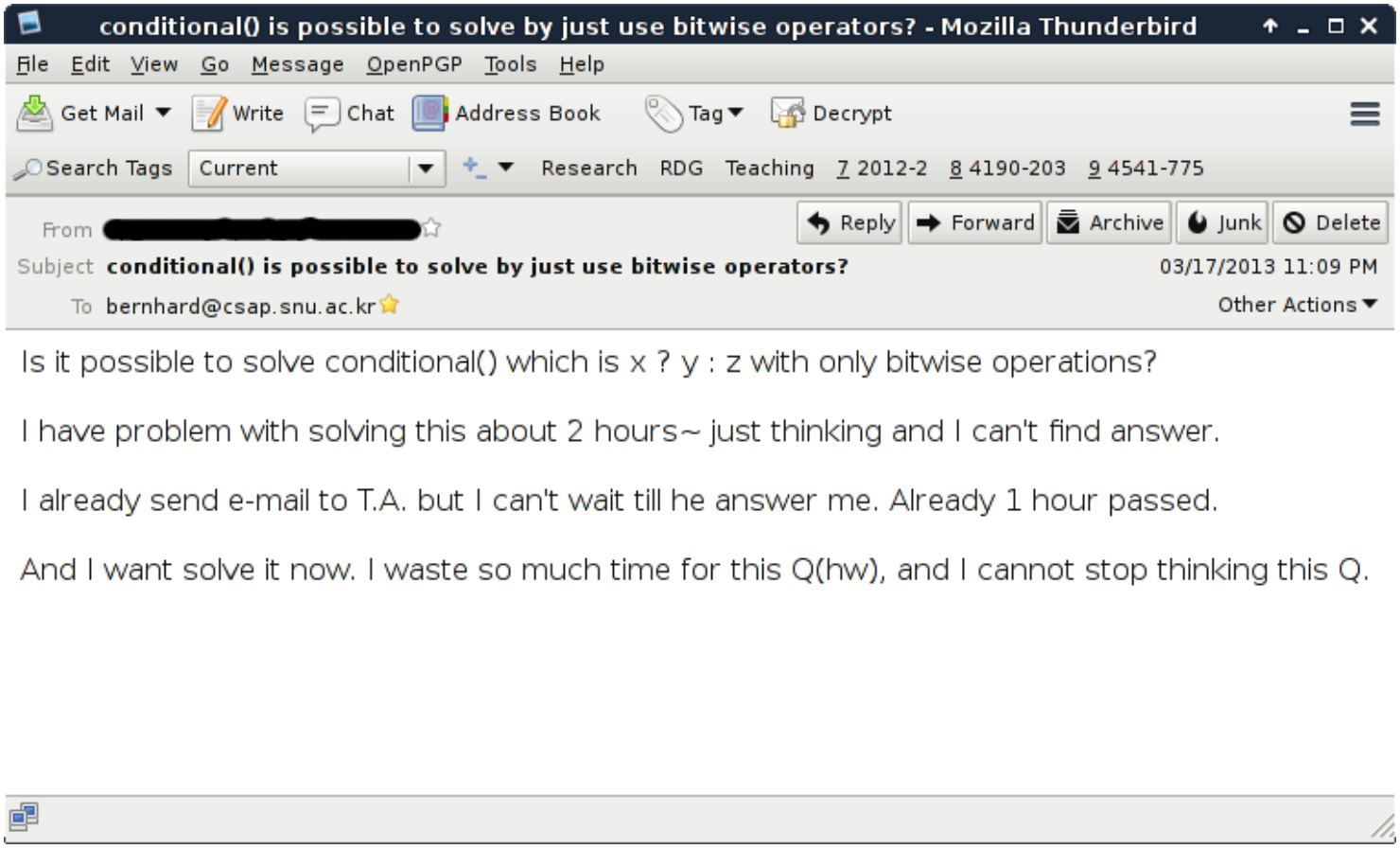
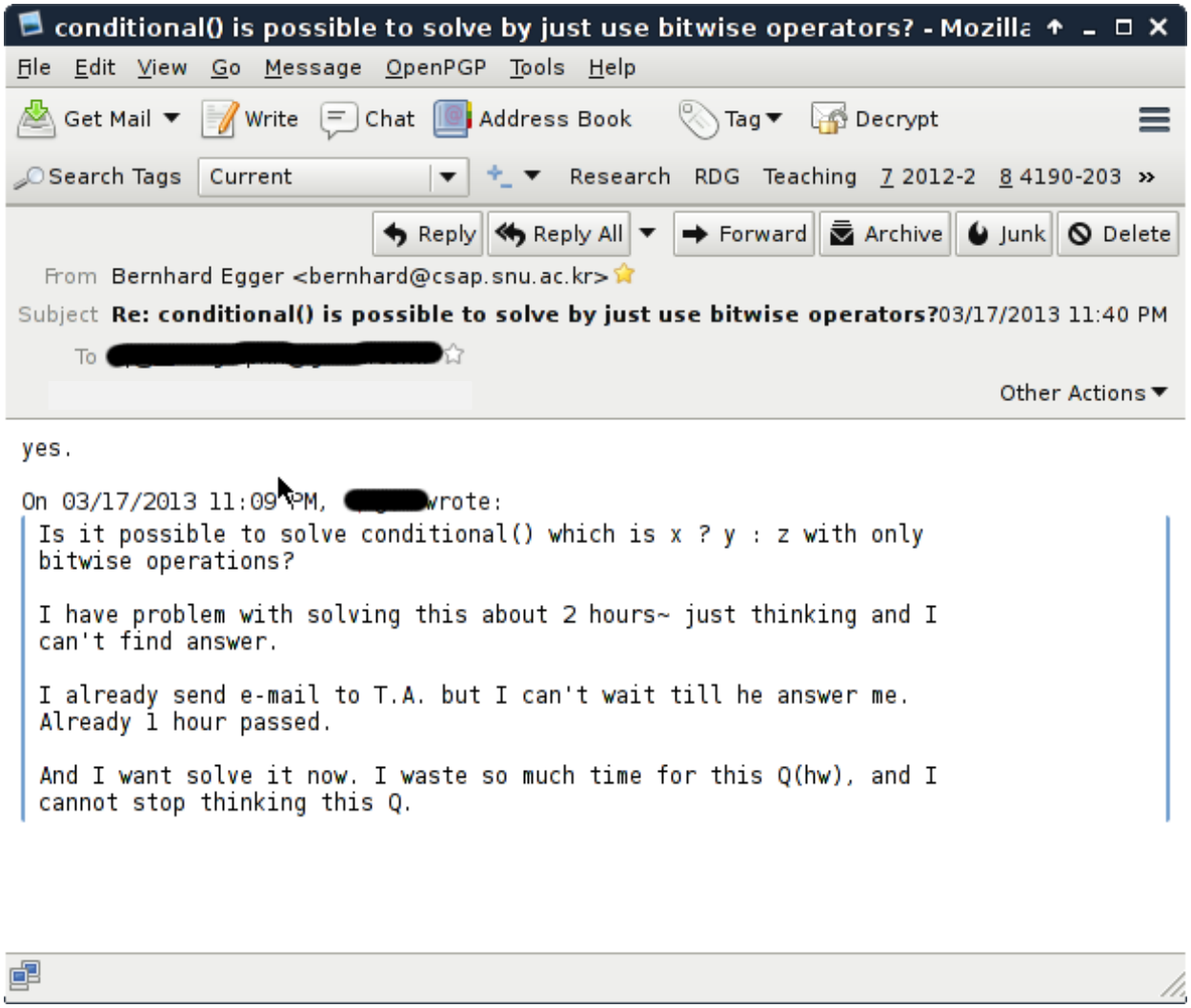
Before we begin…

…a few comments on email communication

The Email



My Answer



Don’ts

- Meaningless subject
  - “URGENT”
  - “I need help”
- Empty body
  - Subject: Need help with the data lab
- No/impolite greetings, salutation
  - Hi, prof!
- Smileys, emoticons, excessive use of punctuation, etc.
  - Help me please ^**^ ☺ ORZ…..!!!!
- Expecting an answer within 1 hour

Dos

- Use a meaningful subject
  - “[4190.308] Regarding Assignment 2”
- Write some content!
  - you can write in Korean if you are not comfortable with English
- State your name, student-number, class, and be polite
  - salutation
    - Dear TA
    - Dear Prof. Egger
  - greetings
    - Best,
      Bernhard Egger
      2013-12345