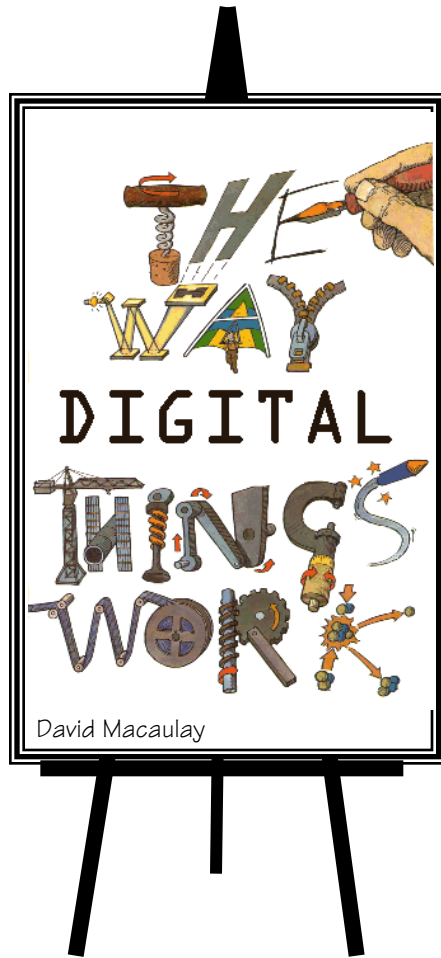


Welcome to Comp 411!

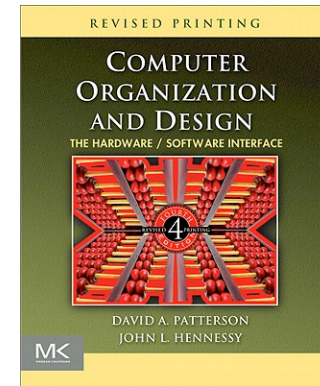


I thought this course was called
"Computer Organization"



- 1) Course Mechanics
- 2) Course Objectives

Whos and Whats...



Lectures: Leonard McMillan (SN-311)

Office Hours Tu 2-3

TA: TBA

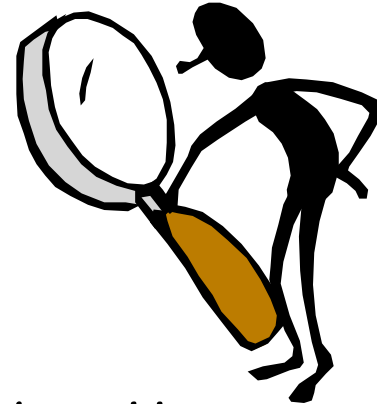
Book: Patterson & Hennessy
Computer Organization & Design
5th Edition, ISBN: 0-12374-750-3

(However, you won't need it until
next week)

Course Mechanics

Grading:

Best 5 of 6 problem sets	25%
Best 9 of 10 Labs	25%
2 Quizzes	30%
Final Exam	20%



You will have at least two weeks to complete each problem set. Late problem sets will not be accepted, but the lowest problem-set score will be dropped.

Friday Labs are mandatory, and will meet on most Fridays, grade is based on completing a “lab check list.”

Quizzes are multiple choice.

*I will attempt to make Lecture Notes, Problem Sets, and other course materials available on the web **before class** on the day they are given.*



Comp 411: Course Website

Logged in as: *guest*

[Log in](#)



Comp 411 - Computer Organization Spring 2013

```
00100111 10111101 11111111 11101000 0x27bdffe8 addiu $sp, $sp, -24
01011111 10111111 00000000 00010000 0xafbf0010 sw $ra, 16($sp) #include <stdio.h>
00111111 00000000 00000000 00000000 0x00000000 printf
00111111 00000000 00000000 00000000 0x00000000 printf("Hello World")
00001100 00000000 00000000 00000000
10001111 10111111 00000000 00010000
01001111 10111101 00000000 00011000 0x27bd0018 addiu $sp, $sp, 24
00000011 11100000 00000000 00001000 0x03e00008 jr $ra
```

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Announcements

- The first lecture will be held on January 9, 2013.

Announcements, corrections, etc.
On-line copies of all handouts
Download Problem Sets

Course Description

Comp 411, *Computer Organization*, explores the topic of how computers work, in terms of both software and hardware. It covers a wide range of topics including what a *bit* is, and why bits are the atoms in the universe of computation. We also discuss how information is represented and processed in hardware, and arrive to the conclusion that, to a computer, everything is data, including the instructions that underly software.

<http://www.cs.unc.edu/~mcmillan/Comp411S13>

Goal 1: Demystify Computers

Strangely, most people (even some computer scientists I know) are afraid of computers.



We are only afraid of things we do not understand!

I do not fear computers. I fear the lack of them.

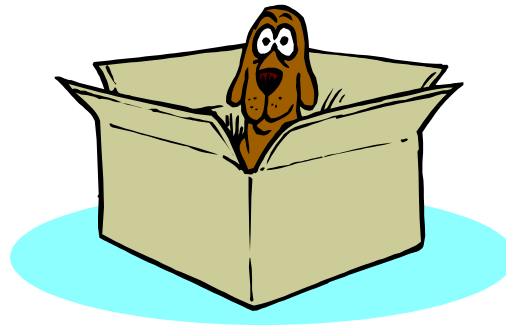
- Isaac Asimov (1920 - 1992)

Fear is the main source of superstition, and one of the main sources of cruelty. To conquer fear is the beginning of wisdom.

- Bertrand Russell (1872 – 1970)

Goal 2: Power of Abstraction

Define a function, develop a robust implementation, and then put a box around it.

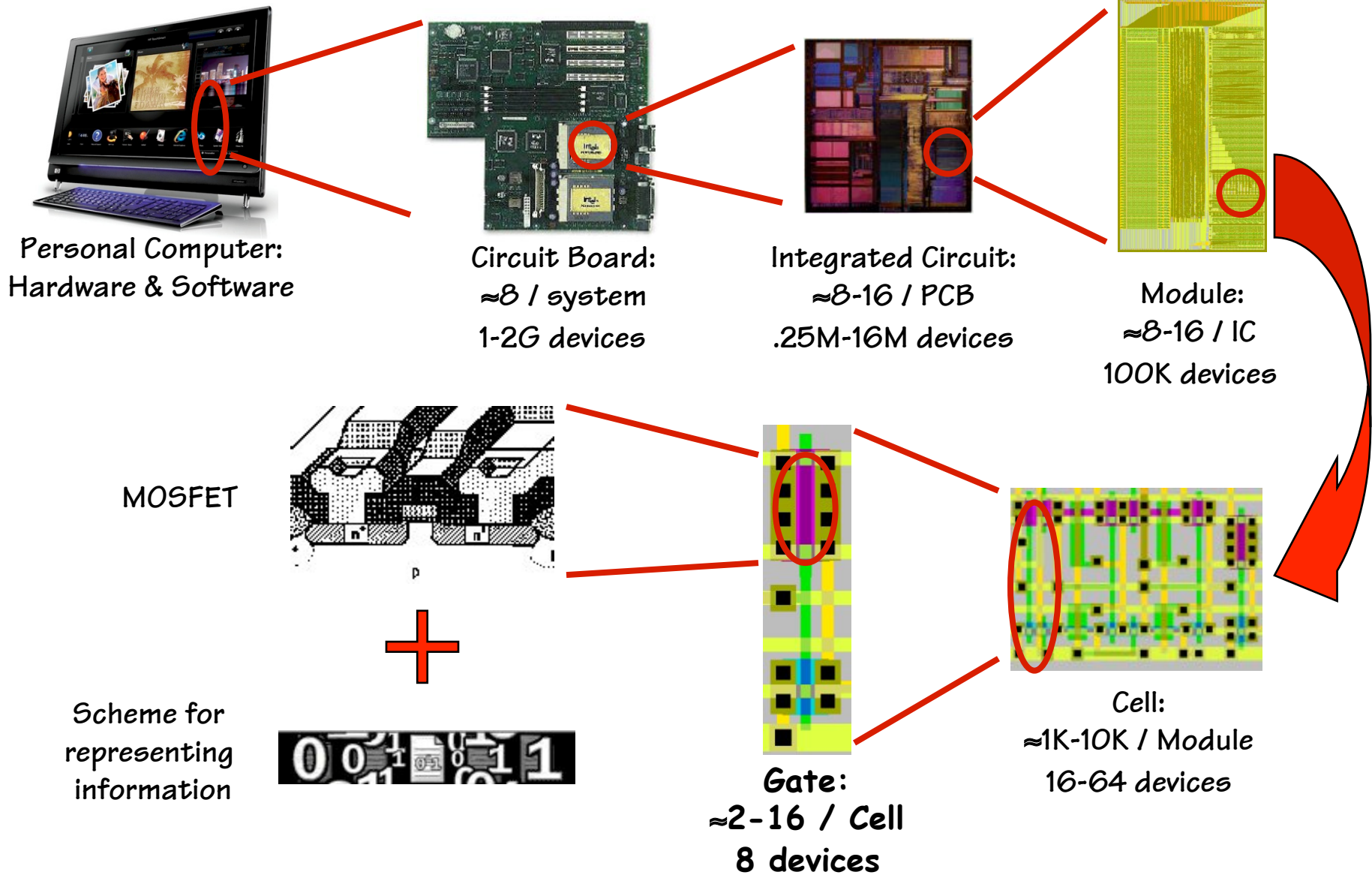


Abstraction enables us to create unfathomable systems (including computer hardware and software).

Why do we need ABSTRACTION...

Imagine a billion --- 1,000,000,000

Understanding systems with >1G components



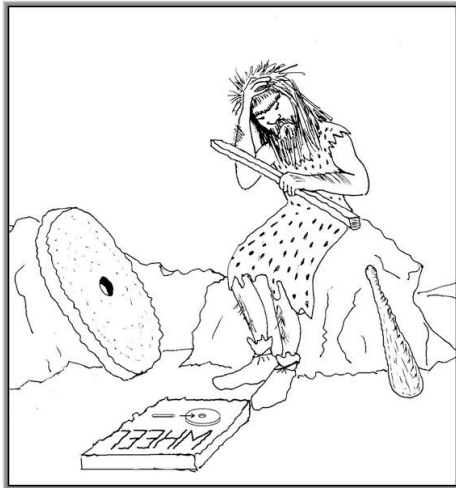
By now, you all know how to program

```
int f(x) {  
    int r;  
    int odd = 1;  
    for (r = 0; x >= odd; r++) {  
        x -= odd;  
        odd += 2;  
    }  
    return r;  
}
```

What does this function do?



What does the computer do?



Problems with self-assembly are nothing new

```
int f(x) {  
    int r;  
    int odd = 1;  
    for (r = 0; x >= odd; r++) {  
        x -= odd;  
        odd += 2;  
    }  
    return r;  
}
```

What does a computer do with a program?

Where we are going...

How is data represented, stored, and manipulated in a computer?

What basic operations does a computer use?

What does mean to “compute”?

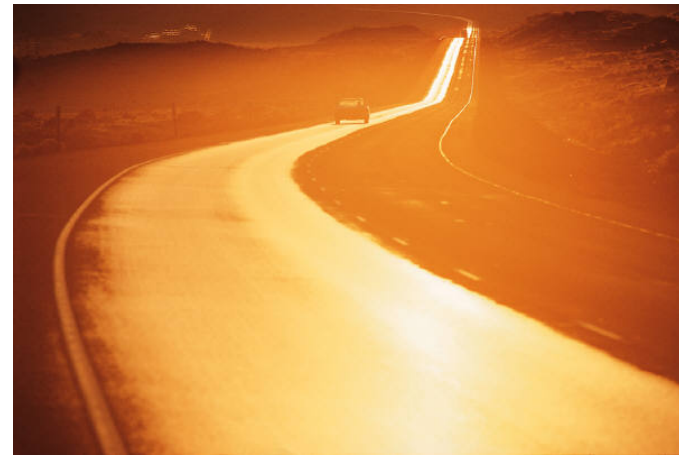
Are there limits to what can be computed?

Why are computers so fast?

What am I asking a computer to do when I give it a program to execute?

How are programs translated into computer instructions?

Why are some programs faster than others that perform the same function?



Summary

411 answers the following questions:

How is information represented, stored, and manipulated by a computer?

What does a computer really doing with my program?

How to design, build, and manage large systems?

411 logistics:

M-W: lectures and discussions

F: ~2-hour Lab (starting next week 1/18)

Next time: What's a bit?