Introduction to Information Systems
– Understanding the digital world

15 The Future of Information System and Overall Review

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12001102, Fall, 2024

Today's schedule

- Overall review (15')

- Future information system (15')

- Introduction to AI tomorrow (20')

- Self assessment (30')

- Class survey (10')

Overall review - Syllabus

Summary: Provide an **overview** of information systems including hardware and software **fundamentals**, **coding**, effective and secure use of the Internet and other **communication** tools, **Artificial Intelligence** (AI), as well as the **ethical** use of computers in business and society through **hands-on activities** and **assignments**.

Goal: Learn **basic concepts and knowledge** to **understand** digital computers and communications including hardware, software, Internet, World-Wide Web (WWW), AI, software license, information security and others, as well as coding and web page creation.

Overall review - Contents
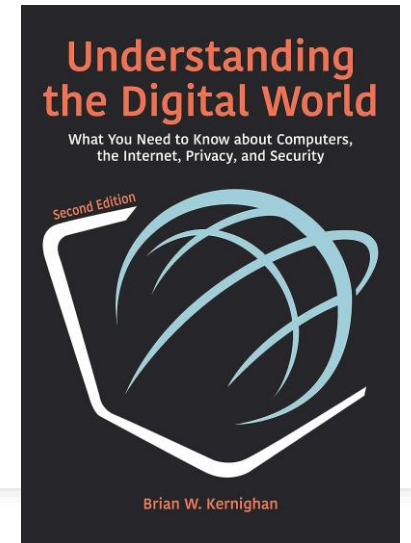
1 What is in a Computer, 2 Bit, Bytes and Representation of Information,

3 Inside the CPU, 4 Programming, 5 Algorithms, Programming and Programming Languages,

6 Programming with Python and Scratch, 7 Operating System and Software Systems,

8 Javascript and HTML, 9 Communication and Networks, 10 The Internet, 11 Data and Information,

12 Privacy and Security, 13 The World-Wide Web (WWW), HTML, and Wiki,

14 Artificial Intelligence (AI) and the Future of Computing,
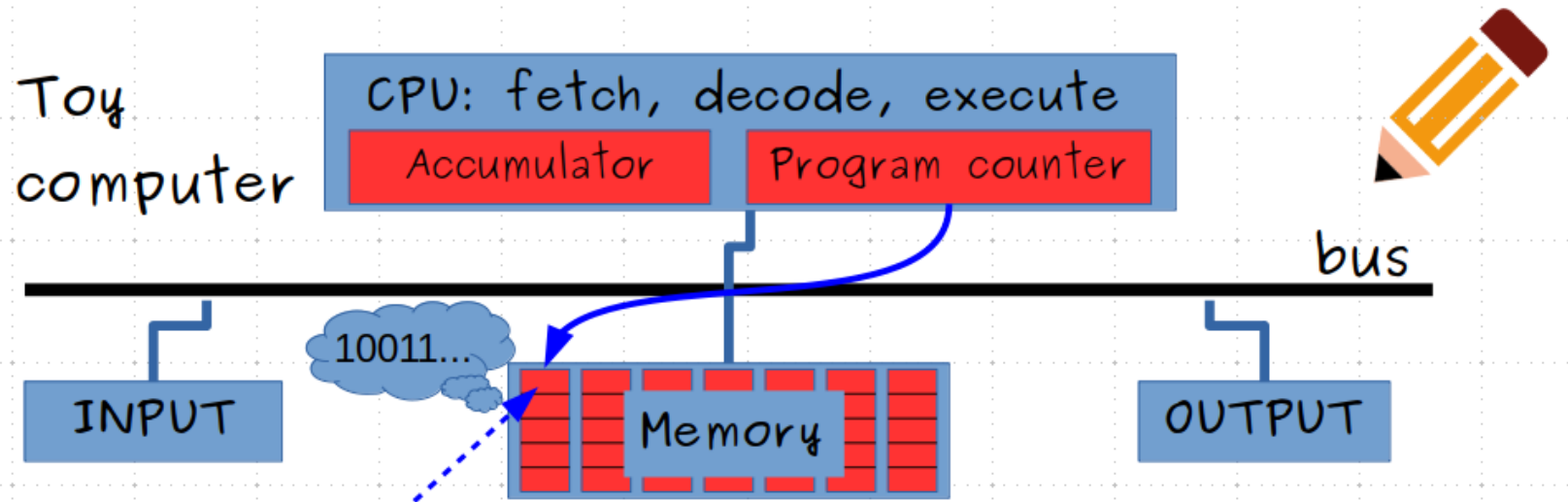
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What's in a computer
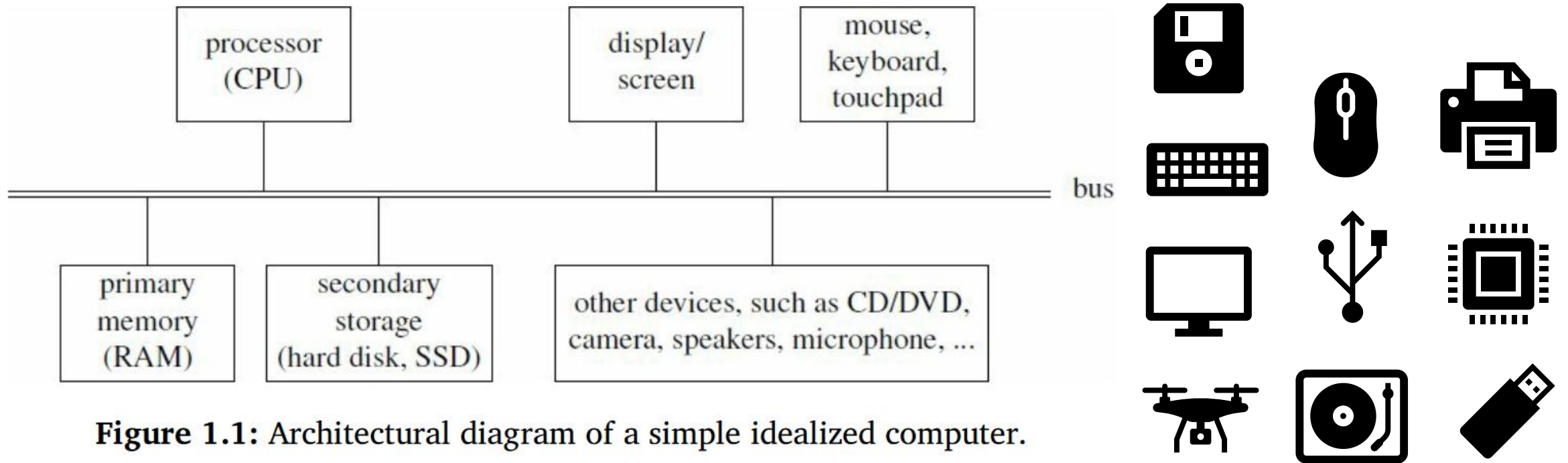
Figure 1.1: Architectural diagram of a simple idealized computer.

Toy Machine & instructions

Toy computer

CPU: fetch, decode, execute

Accumulator | Program counter

bus

INPUT

10011...

Memory

OUTPUT

The programming language we are learning is called the **assembly**, which is almost the same as the machine language.

label	instruction	description
	get	get a number from keyboard into accumulator
L	print	print contents of accumulator
	load Val	load accumulator with Val (Val unchanged)
	store M	store contents of accumulator into memory location called M
	add Val	add Val to contents of accumulator (Val unchanged)
	sub Val	subtract Val from contents of accumulator (Val unchanged)
	goto L	go to instruction labeled L
	ifpos L	go to instruction labeled L if accumulator is >= zero
	ifzero L	go to instruction labeled L if accumulator is zero
	stop	stop running
M	Num	before program runs, set this memory location (called M) to Num

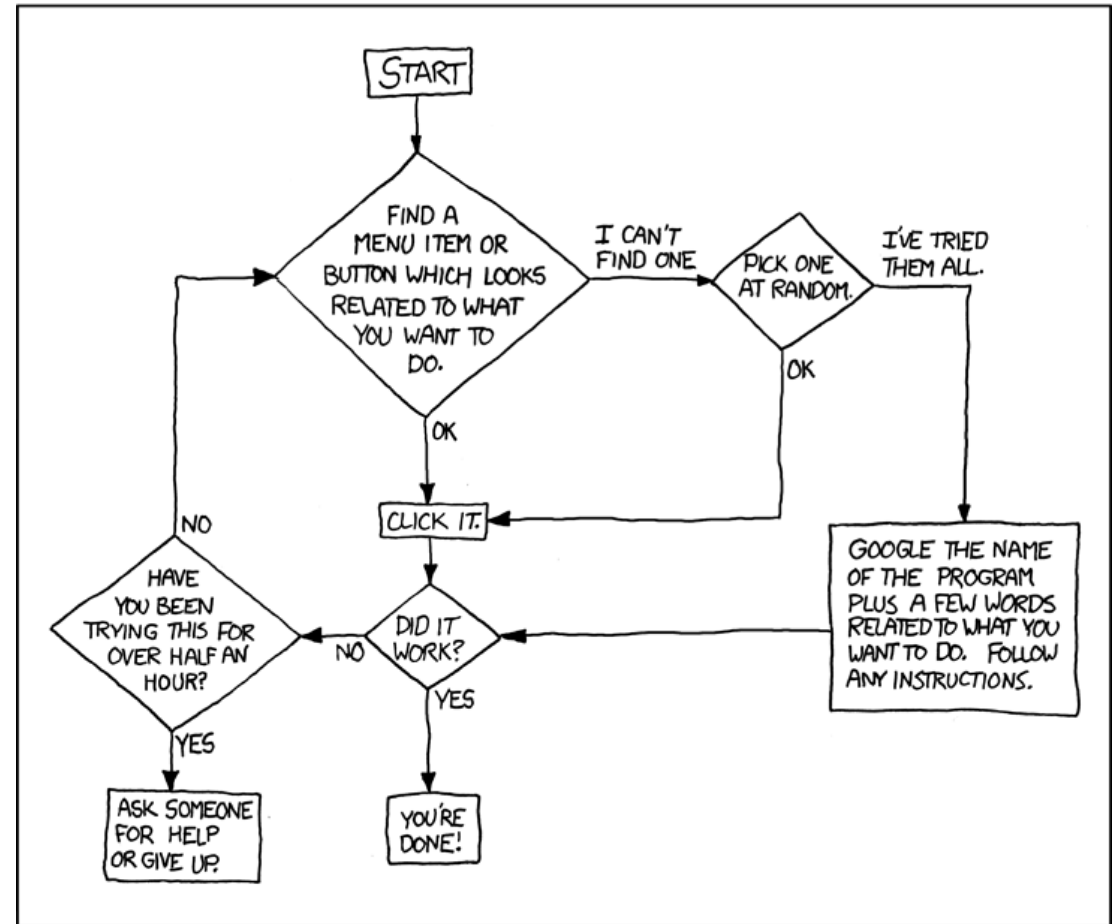# Three fundamental structures of ALL programs (algorithms).

1. Sequential

2. Conditional

3. Iterative (-> loop)

Game developing with Scratch

1. Create an account on Scratch (see https://www.youtube.com/watch?v=se8di8cBj7O).

2. Watch a tutorial https://www.youtube.com/watch?v=1jHvXakt1qw.

3. With your account, create a game introduced in the above tutorial.

4. Create your original game and try to make it as fun as possible (in your opinion).

5. E-mail me the link of your game to liangzhao@acm.org before 9am, Nov. 6th. I will check how fun it is and grade it (based on my impression).

What does an OS do?

CPU (task management)
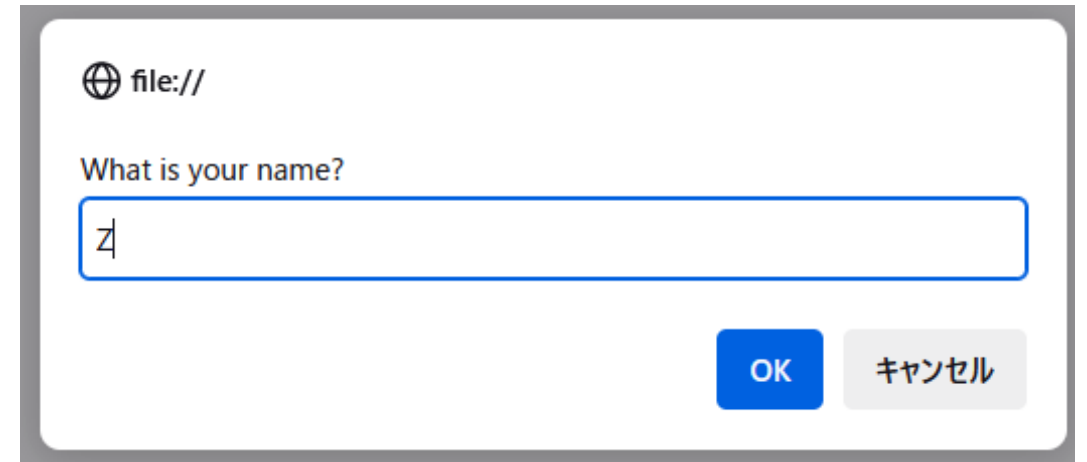
Disk (HDD, SSD, etc) and file

RAM (memory)

Devices (monitor, keyboard, mice, printer, etc)

```
<!DOCTYPE html>

<html>

  <head><title>Javascript Ex2</title></head>

<body>

  <script>

    var name = prompt("What is your name?");

    var sentence = "Hello, " + name + ".";

    document.write(sentence);

  </script>

</body>

</html>
```

file://

What is your name?

Z

OK   キャンセル

← → C

Hello, Z.

Edit and save the above source to ex2.html and use a browser to open it.
Or use https://www.w3schools.com/js/tryit.asp?filename=tryjs_myfirst

Introduction to telecommunication

- Tin can telephone (3')

- Morse code: https://www.youtube.com/watch?v=iy8BaMs_JuI (4')

- Codes for text message (e.g. ASCII), for emoji (e.g. UTF-8), for video message (e.g. H264)

You must use a Windows or Mac computer.

1. Open a command line (Search cmd. Mac: Finder -> Go -> Utilities -> Terminal)

2. ipconfig (Mac: ifconfig)

3. ping aw.gsais.kyoto-u.ac.jp (Win)
   ping –c 4 aw.gsais.kyoto-u.ac.jp (Mac)

4. nslookup g.gg

5. Whois: https://www.whatismyip.com/ip-whois-lookup/

Classwork and mini test #10

Finger or Internet: 2024

votes

n/a (3/50=6%)

Give up the Internet (10/50=20%)

Cut off a finger (37/50=74%)
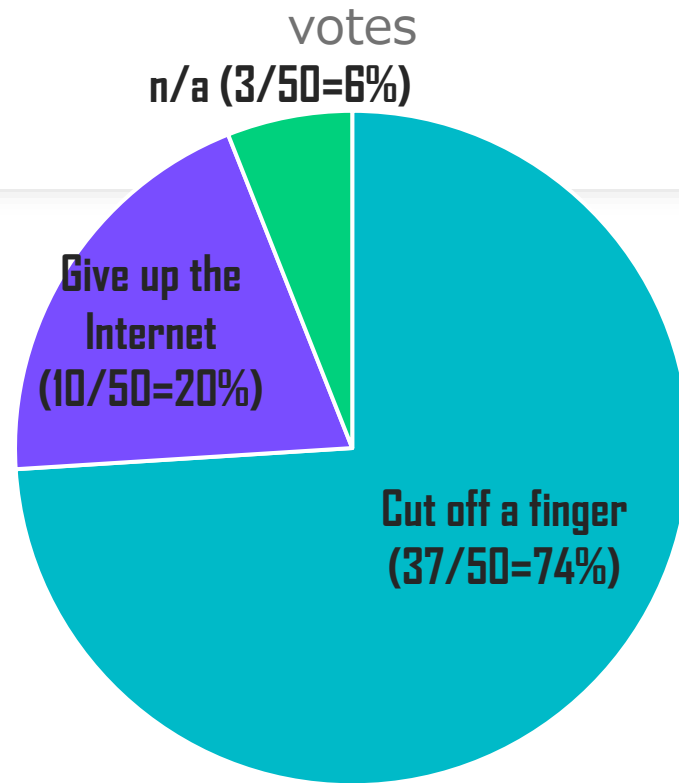
■ Cut off finger   ■ Give up the Internet forever   ■ n/a

Result of the ILA class in Dec. 2024

Creating web pages with Wiki

- Wiki: language and system to create web contents with syntax simpler than HTML

- Feature: usually open for multi-users' writing (unlike the closed FB, Line, etc)

- Example: Wikipedia (see more detail on https://en.wikipedia.org/wiki/Wiki)

- Classwork: Access the next site and create your web contents with the Wiki system.

http://aw.gsais.kyoto-u.ac.jp/z/wiki/

A video on future information system

👍 https://www.youtube.com/watch?v=5TNAz1HYg18 (13')

Introduction to AI tomorrow

- Biggest invention of human

- Promising to solve every issue today

https://www.youtube.com/watch?v=BzJHh5lZV2o

- May be the LAST invention of human.

- May cause NEW ISSUES in all fields.

Mitigating the risk of extinction from AI should be a global priority alongside other societal-scale risks such as pandemics and nuclear war.

Signatories:

☑ AI Scientists   ☑ Other Notable Figures

Geoffrey Hinton
Emeritus Professor of Computer Science, University of Toronto

Yoshua Bengio
Professor of Computer Science, U. Montreal / Mila

Demis Hassabis
CEO, Google DeepMind

Sam Altman
CEO, OpenAI

https://www.safe.ai/work/statement-on-ai-risk

Research in my lab

We approach research with a **focus on information**, aiming to shape the future of life and society. We recruit master and doctoral students with backgrounds of but not limited to AI, computer science, data science, network science, law studies, economics, and interested in the **fusion of science, technology, and humanity**.

Our work spans diverse methodologies, including network algorithms, optimization, image processing, machine learning, deep learning, and learning theories. Through these research, **we aim to contribute not just to technology but also to understanding wisdom and creativity for a better future**.

Self Assessment (30')

I would be glad to read your feedback and will try to improve the lecture the next year based on it. The feedback, of course, does not affect your grade.

Class survey (10')

-> the instruction.

Notice: Your answer will not affect the grade, and the lecturer cannot identify an individual student from the survey.