Topic Discussion

Choose one of the following topics and do your survey. And if you find other interesting topics about computers, please share them for extra presentations. Each team should do the presentation with a PPT, and share your opinions and thoughts with all classmates in discussion course. Please limit your time to 5~10 minutes.

Survey 1

Turing Machine, von Neuman architecture and Havard Architecture

One thing that you need to be clear: What is the most significant difference between modern computers and ancient computing devices?

Things you might cover:

- What's the context of them?
- How do these concepts evolve?
- Case study of them (Give some examples).
- ...

Survey 2

CISC vs. RISC

Things you might cover:

- What's the essential difference between them?
- The advantages & disadvantages of them.
- Case study of them

- ...

Survey 3

Modern ISA from the real world (e.g. ARM, RISC-V, X86, and so on)

Things you might cover:

- Data types
- Addressing mode
- Assembly language
- Registers Description
- General / Specialized Instructions
- Subroutine
- ...

Survey 4

General computing processors part I.

Most of you should have used Intel's CPUs and Nvidia (or AMD)'s GPUs, but how much do you know about these devices? And do you know other general-purpose processors?

Search them and share your findings.

Things you might cover:

- Hardware architecture and its evolution.
- ISA
- Software programming model

- Programming language
- ...

Survey 5

General computing processors part II.

You should have been familiar with Intel's CPUs and Nvidia's GPUs, but do you know domestically produced computing devices like HUAWEI Kunpeng, LoongSon, and so on?

Search them and share your findings.

Things you might cover:

- Hardware Architecture
- ISA
- Software programming model
- Programming language
- ...

Survey 6

General purpose processors v.s. Special purpose processors

Do you know special purpose processors for accelerating deep learning like Cambricon accelerators, TPUs, or HUAWEI Ascend?

Things you might cover:

- What's the essential difference between them.
- The advantages & disadvantages of them.

- Case study of them.
- ...

Survey 7

Data movement instructions of x86

Things you might cover:

- Case study of them.
- Why do we need different kinds of Data Movement Instructions?
- Can you design a novel series of Data Movement Instructions?
- ...

Survey 8

Interrupt

Things you might cover:

- Hardware interrupt & software interrupt
- Case study
- Signals of Unix-like systems
- ...

Survey 9

Branch

Things you might cover:

- When it will happen & how does it affect CPU’s state?
- Case study
- Prediction & Predication
- …