Topic discussion

Choose one of the following topics and do your survey. And if you can find other interesting topics about computers, please share them for extra presentation. Each team should write a PPT of your survey, and share your opinions and thoughts with everyone on discussion course about 5-10 minutes.

Survey 1

Turing Machine, von Neuman architecture and Havard Architecture

- What's the context of them?
- How do these concepts evolve?
- Case study of them.
- ...

Survey 2

General Purpose Computers v.s. Special Purpose Computers

- What's the essential difference between them?
- The advantages & disadvantages of them.
- Case study of them. (e.g. Titan, Anton)
- ...

Survey 3

CISC vs. RISC

- What's the essential difference between them?
- The advantages & disadvantages of them.
- Case study of them (Is AMD Ryzen™ 7 1700 CISC or RISC?)
- ...

Survey 4

Data Movement Instructions of x86

- 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 5

The Instruction Cycle

- Why do we decompose the execution of an instruction to several instruction cycles?
- Should we let the length of different instruction cycle be the same? Why?
- ...

Survey 6

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

Things you might cover:

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

Survey 7

Other General Computing Devices

Do you know Xeon Phi, GPU (NVIDIA or AMD), or other general-purpose processors?

Search them and share your findings.

Things you might cover:

- Hardware Architecture
- Software programming model
- Programming language
- …

Survey 8

Branch

Things you might cover:

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

Survey 9

Interrupt

Things you might cover:

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