Calculator System

This class is about a system in the computers. This class is strongly related with a informational experiment, which is held Tuesday and Friday.

Impression

- I didn't know about the inside of the computer, so this class gave me a lot of information
- The latter half is more difficult. The idea of thread and virtual memory is hard to understand. I can't imagine the thread easily, but pictures that google search engine gave me was really helpful.
- I want to learn the OS and network. Can't wait 3S and 3A semester.

Memo

1. Data in a computer

   Computers recognize data in a different way from our recognition.
   - How numbers are recognized
     - numbers as a binary
     - negative number
     - floating-point
   - How characteres are recognized
     - character code
     - redundant code
     - some problems in a character code

2. Inside Computers
   - How data is saved in the memory

- The varistion of registers and how it is used.
- The flow and the effect of operations

3. Instruction
   - operand and opecode
   - stack
   - addressing mode
   - the variations of instruction
     - shift, control, privilege, etc.
   - function call
     - how local variable is stored in a stack.

4. Interrupt
   - flow of interrupt
   - mask
   - Two ways to process input and output
     - polling
     - interrupt
     - PIO
     - DMA

5. CPU and Cache

6. OS
   - Why OS is needed
   - The construction of OS

7. Virtual Memory
   - use page mapping table (PMT), to store the mapping between virtual addresses and physical addresses. If page table lookup is failed, some operating systems cause the segmentaion fault.
   - Advantages
     - enable to use more memory (ram) rather than originally has
     - enable to load processes faster because of Demand Paging
     -

8. System Call
   - provide an interface between a process and the operating system

9. Process

- it is made up of multiple threads of execution that execute instructions concurrently
- variation of process
    - user process and super user process
    - system process and server process
- multi programming and multi tasking
- process and thread
- variation of threads
    - kernel thread
        * light weight process
    - user thread
- scheduling
- Signal
    - to notify it of an event that occurred
    - process to process (same user) or kernek to process
    - when process receives a signal, it goes to a signal process routine
- creation of processes
    - environment
    - pid
- Link
- File System
    - controls of the file access
- device driver
    - special file
        * The interface of the devide driver is treated as it was a file system
        * exists in /dev
- Communication between processes
    - pipe
    - socket
    - shared memory
    - message queue

10. Network
- Basic words for Network

- Protocol
- IP address
- IP packet
    - compare network portion of IP address
    - same subnet $\rightarrow$ search L2 address
    - different subnet $\rightarrow$ send it to the router
- DNS
- TCP
- UDP
- Ethernet