CS418—Operating Systems

Lecture 1

Textbook: Operating Systems
by William Stallings

0. About CS418

- Course home page: http://www.cs.montana.edu/bhz or http://www.cs.montana.edu/courses/418
- Basic operating systems (67%) and advanced OS (33%)
- Basic operating systems: memory management, processor management, device management and file management
- Advanced operating system: threads, symmetric multiprocessing, multiprocessor scheduling, networking, security, public key cryptography
- We will mainly focus on concepts and algorithms. More advanced materials will be covered in CS518.
- Evaluation (to be finalized).
  option 1: in-class tests (30%), assignments (20%) and project (10%) and final exam (40%)
  option 2: in-class tests (30%), assignments (30%) and project (10%) and final exam (30%)
  option 3: in-class tests (30%), assignments (20%) and programming project (20%) and final exam (30%)
- To pass the course, you must get at least 30 out of 100 in the final exam.

1. Name some operating systems (OS) you know of

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2. What is OS?

- OS is the part of computing system managing all of the hardware and software.
- For example, it controls every file, device, section of memory, and every nanosecond of processing time.
- In the first part of this course, we will mainly focus on how OS works, the related concepts as well as algorithms.
- In the recent years, networks become more and more important in operating systems. This turns distributed computing and network operating systems into reality. We will cover some of this in the second part of the course.
- Some contents on computer architectures and hardware will be covered, if necessary.

3. What is OS composed of?

- **1. Memory Manager**, which is in charge of main memory.
- **2. Processor Manager**, which decides how to allocate the Central Processing Unit (CPU).
- **3. Device Manager**, which monitors every device, channel and control unit.
- **4. File Manager**, which keeps track of every file in the system, including data files, assemblers, compilers and application programs.

4. Types of OS

- **1. Batch system**.

- **2. Interactive system**.

- **3. Real-time system**.

- **4. Hybrid system**.

5. A brief history of OS development

- **1. First generation (1940–1955)**, mainly used in military.

- **2. Second generation (1955–1965)**, mainly used in business.

- **3. Third generation (1960s–late 1970s)**.

- **4. Post-3rd generation (late 1970s–now)**.