What is an operating system?

What is an interrupt? How does operating system handle interrupt?

In what cases will interrupt happen?

What is caching? How is it used?

What is direct memory access?

What are the advantages of multiprocessors systems?

Briefly describe how modern computer works.

What is multiprogramming and multitasking? What’s their difference?

What is a system call. How does OS switch between user mode and kernel mode?

What are the activities of process management?

What are the activities of memory management?

What are the activities of file management?

钟教授上课说过最多的设计原则是什么？

What services do operating system provide?

Why use APIs rather than system calls?

What kinds of system calls do OS provide?

What kind of system programs are there?

What’s the user goals and system goals to design an operating system

What is a microkernel system. Describe its features and draw the diagram of it.

**What is Kernighan’s Law?**

What are the parts of the process? What are their usages?

What is context switch?

What are the zombie and orphans in the process?

What is the producer-consumer problem?

What are the two methods for inter-process communication? Briefly describe them.

What are the blocking and non-blocking send/receive? What are the possible combinations of them?

What are pipes? What are the two kinds of pipes?

What’s the difference between process and thread?

What are the advantages of thread over process?

What is the Amdahl’s Law? (云计算联动)

What are the 3 kinds of thread models? Draw a diagram for each of them. List at least one real-case operating system example for each case.

What is the thread pool? What’s the advantages of it?

What is TLS? What’s the difference between TLS and local variables?

What are the scheduling criteria for process scheduling?

What is the convoy effect?

Which scheduling algorithm gives the shortest average waiting time?

预测题型:Process scheduling 不同算法的次序,平均等待时间计算

What is starvation and its solution in process scheduling?

What are the algorithms used in foreground and background modes?

What’s the difference between soft and hard real-time system?

What is the deterministic modeling in algorithm evaluation?

What’s Little’s Law? If the average wait time per process is 3 seconds and normally 18 processes in queue, what’s the average arrival rate ?

What time can address binding happen?

What are the logical address and physical address? What’s the difference between them?

What is stub in dynamic linking in memory management? What’s its usage?

What is swapping? Briefly describe the mechanism and draw the diagram.

What are the strategies to allocate the memory in contiguous allocation?

What kinds of fragmentation are there? What is 50-percent rule?

What are STBR and STLR in segmentation?

What is TLB? What’s its usage and structure?

What is lazy swapper? (never swaps a page into memory unless page will be needed)

When will an abort happen? (invalid reference)

What are the steps in handling a page fault?

How to solve the instruction restart problem?

* + 1. the microcode computes and attempts to access both ends of both blocks.
    2. The other solution uses temporary registers to hold the values of overwritten locations

How to optimize demand page?

* + 1. Copy entire process image to swap space at process load time
    2. Demand page in from program binary on disk, but discard rather than paging out when freeing frame

What is Copy-on-Write? **Copy-on-Write** (COW) allows both parent and child processes to initially *share* the same pages in memory

What is modify(dirty) bit? What’s its usage?

* **Copy-on-Write** (COW) allows both parent and child processes to initially *share* the same pages in memory

What’s the stage of page replacement?

想要的page—free frame—换，更新页表/框架表

What is Belady’s Anomaly? 增加frame数目造成更多的page fault

What are the algorithms for page replacement? FIFO, LRU, Page buffering (free frames)

What are the counting algorithms?

**LFU Algorithm**: replaces page with smallest count

**MFU Algorithm**: based on the argument that the page with the smallest count was probably just brought in and has yet to be used

What are the allocation schemes? Fixed固定分配，留一些自由池, priority优先级

What are the difference between global and local allocation?

What is thrashing? Why does thrashing occur? **Thrashing** ≡ a process is busy swapping pages in and out Σ size of locality > total memory size

Why does demand paging work? **Locality model**

What are **memory-mapped files**? Memory-mapped file I/O allows file I/O to be treated as routine memory access by **mapping** a disk block to a page in memory

What is buddy system? Allocates memory from fixed-size segment consisting of physically-contiguous pages

* Advantage – quickly coalesce unused chunks into larger chunk
* Disadvantage - fragmentation

What is TLB reach? TLB Reach - The amount of memory accessible from the TLB

What is I/O Interlock? **I/O Interlock** – Pages must sometimes be locked into memory