COP-5614 Operating Systems Introduction Review

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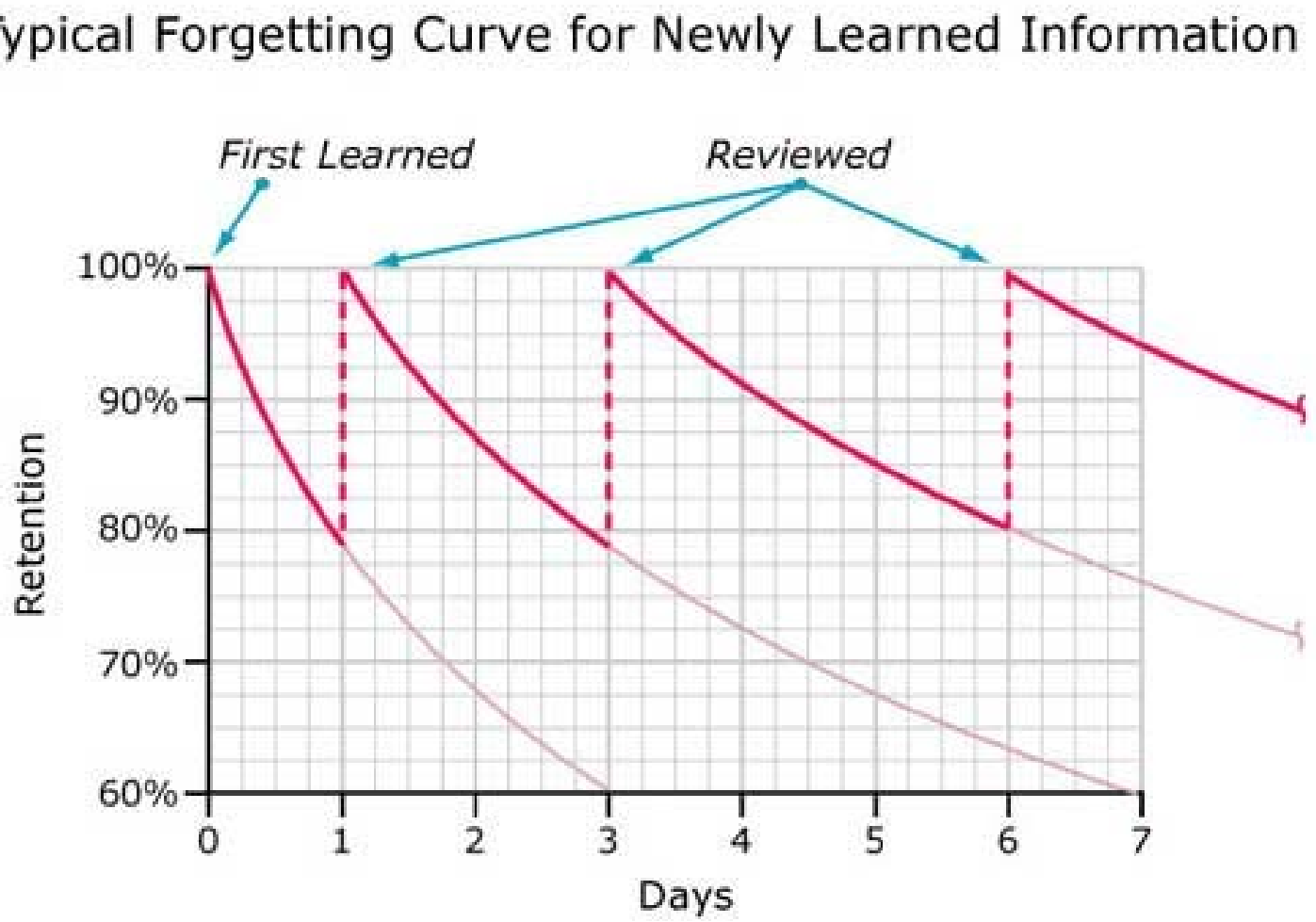

Questions?

- Explain the main purposes of an operating system?
  - (1) As an **abstraction**, the operating system's job is to provide the users with abstractions, such as processes, address spaces, and files, which are more convenient to use than the actual hardware,
  - (2) As a **resource manager**, the operating system's job is to manage the different parts of the system efficiently.

Questions?

- What is time sharing in OS? What is space sharing in OS?
  - Time sharing: sharing executing power (such as **CPU**, logical processor, GPU) by many users (such as OS processes, threads, network requests) at the **same time**.
  - Space sharing: **sharing memory space** (hard disk, RAM, database) by many different users (such as in-place algorithms, executing threads) at the **same space**.

Questions?

- What is a trap instruction? Explain its use in operating systems.
  - A Trap is a **software generated interrupt**. A Trap is set to have occurred when some exceptions occurs like - a process accessing a memory address outside it's address space would result in a trap which is handled by the OS.
  - A trap usually results in a **switch from user mode to kernel mode**, wherein the operating system performs some action before returning control to the originating process.

Questions

- What are interrupts?
  - An interrupt is something generated by **the hardware** (devices like the hard disk, graphics card, I/O ports, etc). **These are asynchronous** (i.e. they don't happen at predictable places in the user code) or **"passive"** since the interrupt handler has to wait for them to happen eventually.

Questions?

- What is CPU pipeline?
  - A technique that implements a form of parallelism called **instruction-level parallelism** within a single processor. It therefore allows **faster CPU throughput** (the number of instructions that can be executed in a unit of time) than would otherwise be possible at a given clock rate.

Questions?

- What is virtual memory and virtual memory address?
  - Virtual memory is a feature of an operating system that allows a computer to compensate for **shortages of physical memory** by **temporarily transferring pages of program data from main memory to disk storage.**
  - It maps memory addresses used by a program, called **virtual addresses**, into physical addresses in computer memory.

Questions?

- What is i-Node? Explain its use in operating systems.
  - i-Node, **one per file**, a data structure used to **represent a filesystem object**, telling who owns the file, where its disk blocks are, and so on

Ending

- https://www.youtube.com/watch?v=5AjReRMoG3Y