Lecture#12

Virtual Memory

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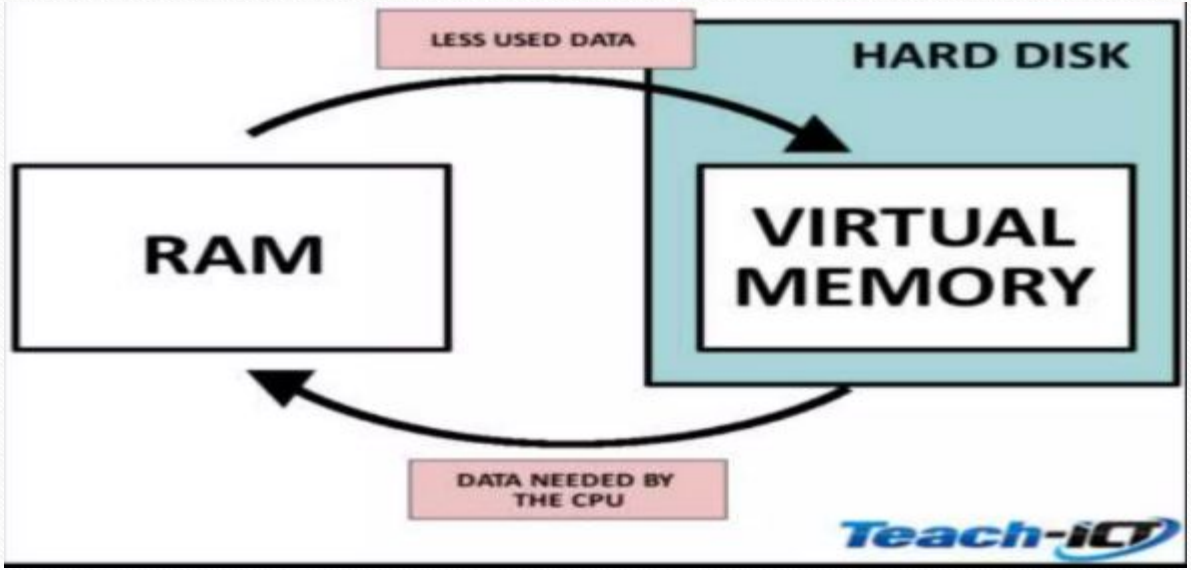
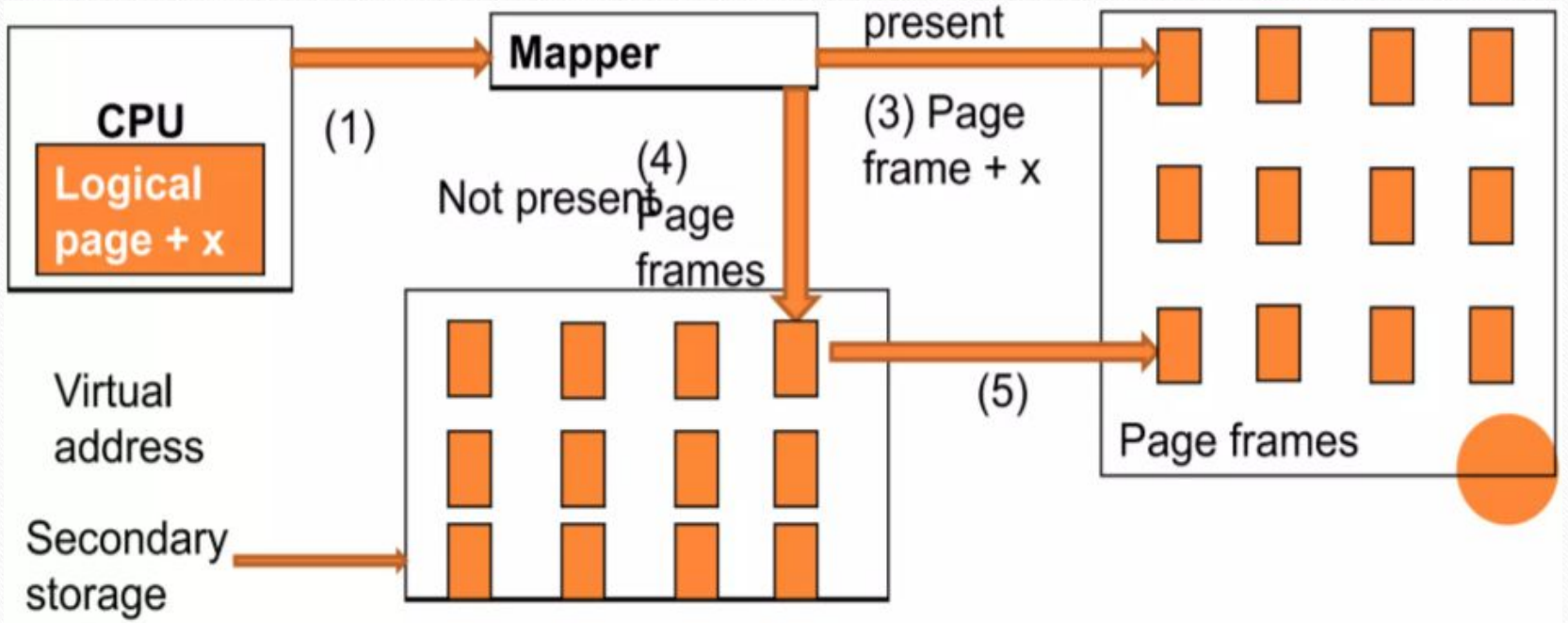
Virtual Memory

- Virtual memory is a common part of operating system on desktop computers.
- The term virtual memory refers to something which appears to be present but actually it is not.
- The virtual memory technique allows users to use more memory for a program than the real memory of a computer.
- Virtual memory is a separation of user logical memory from physical memory. In this method, we keep only a part of the process in the memory and other part on the disk (secondary storage).

Virtual Memory



Virtual Memory



Need of VM

- Virtual memory is a imaginary memory which we are assuming.
- If we have a material that exceed your memory at that time we need to use the concept of virtual memory.
- Virtual memory is temporary memory which is used along with the ram of the system.

Importance of Virtual Memory

- When your computer runs out of physical memory it writes what it needs to remember to the hard disc in a swap file as virtual memory.
- If a computer running Windows requires more memory/RAM then there is installed in the system to run a program, etc, it uses a small section of the hard drive for this purpose.

Advantages of VM

- Only part of the program needs to be in memory for execution.
- Logical address space is much larger than physical address space.
- Need to allow pages to be swapped in and out.
- Virtual memory allows speed gain when only a particular segment of the program is required for the execution of the program.
- This concept is very helpful in implementing multiprogramming environment.

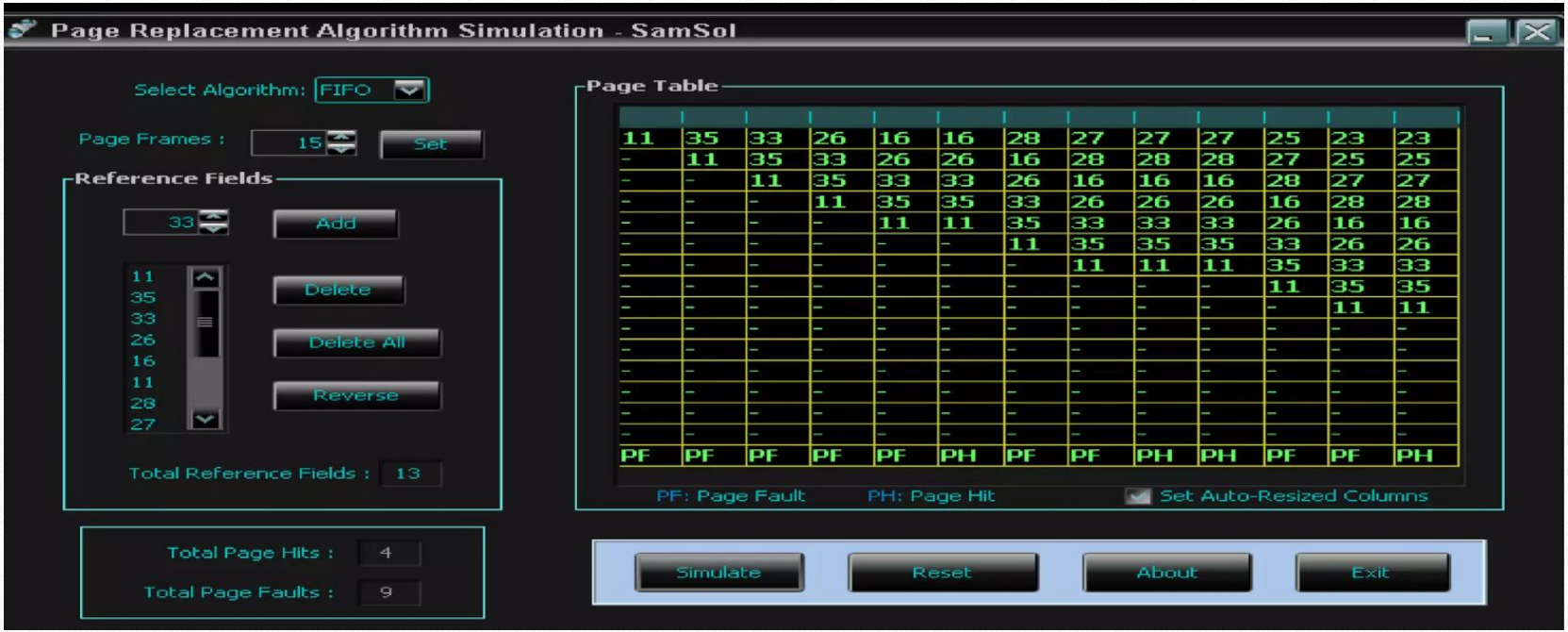
Address Space and Memory Space

- Virtual memory is the address used by the programmer and the set of such addresses is called address space.
- An address in main memory is called a physical address.
- The set of such locations in main memory is called the memory space.
- Thus the memory space consist of the actual main memory locations directly addressable for processing.

Page Replacement Algorithms

- In a computer operating system that uses paging for virtual memory management, page replacement algorithm decide which memory pages to page out.
- When a page of memory need to be allocated.
- It is the technique used by operating system to decide which memory pages swap out .
- It is also decided that is memory , how much frames to allocate to each process.
- FIFO (first in first out)
- LRU (Least Recently used)
- OPT (Optimal)

Common Implementation Issues



END OF LECTURE!