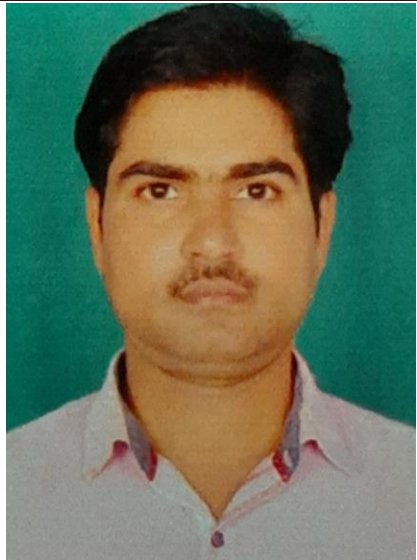




Operating system Class-

BCA IV Semester



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OUTLINE:-

UNIT:-I

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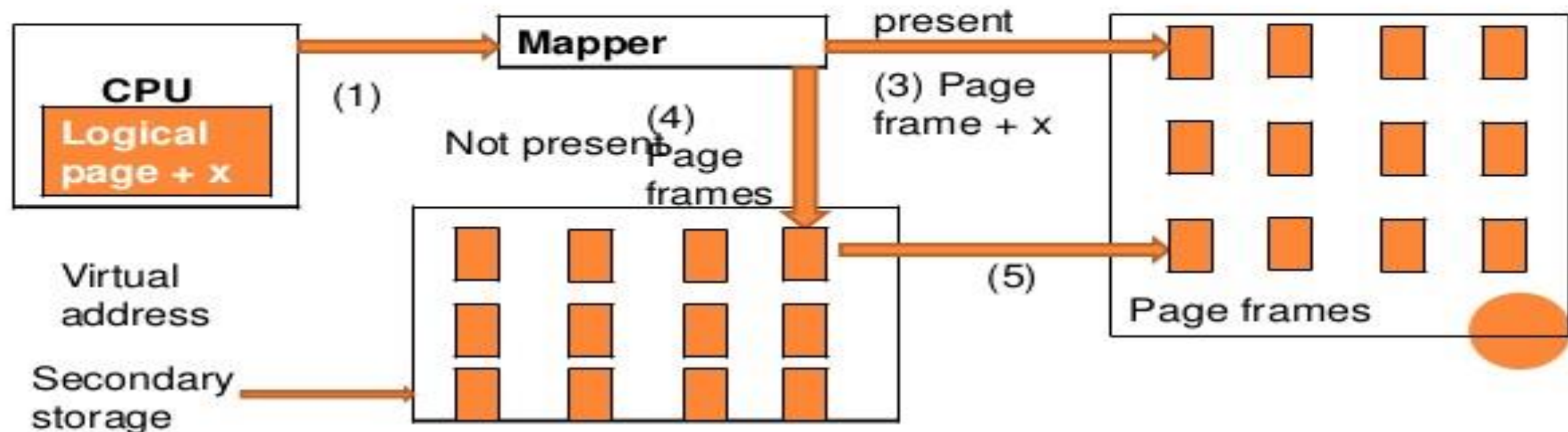
- virtual memory
- Needs of virtual memory
- Importance of virtual memory
- Advantage of virtual memory
- Disadvantage of virtual memory
- Address space & memory space
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- FIFO
- LRU
- OPT



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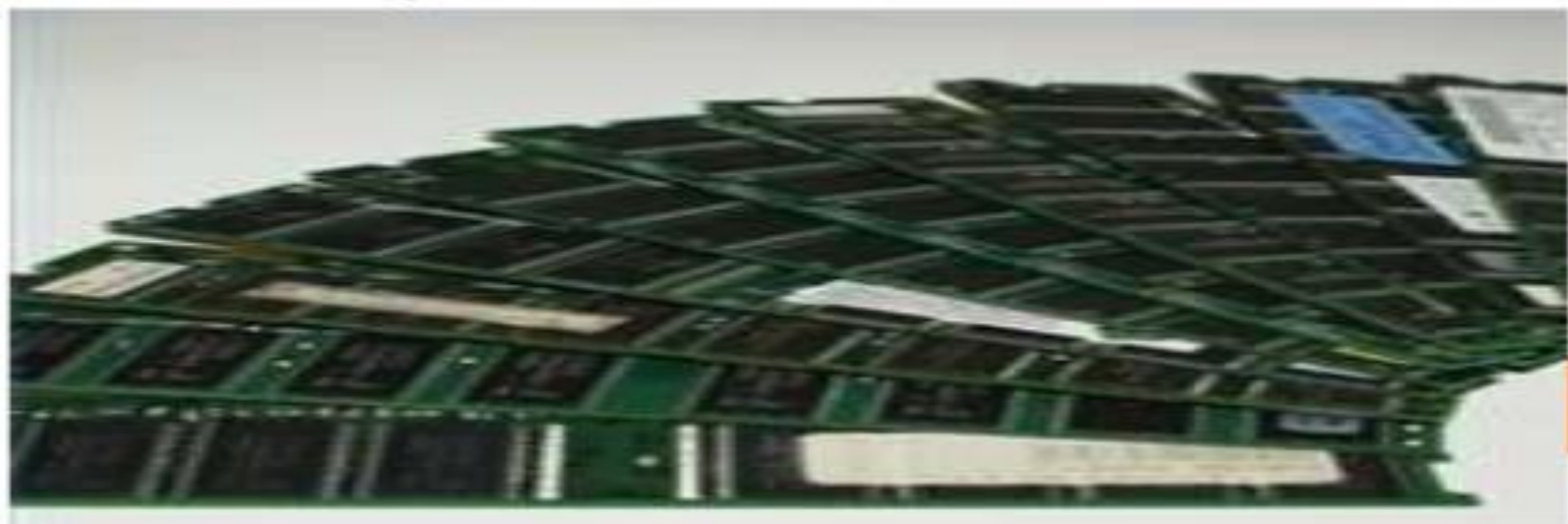
VIRTUAL MEMORY

- 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.



NEED OF VIRTUAL MEMORY

- 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



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.
- FIFO (first in first out)
- LRU (Least Recently used)
- OPT (Optimal)

Page Replacement Algorithm Simulation - SamSoft

Select algorithm: OPT

Page Frames: 3

Reference Table:

1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41	42	43	44	45	46	47	48	49	50
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Total Page Hits: 13

Total Page Faults: 37

Simulation Reset Stop Exit

FIFO

First in first out is very easy to implement.

The fifo algorithm select the page for replacement that has been in memory the longest time.

time	1	2	3	4	5	6	7	8	9	10	11	12
page	p2	p3	p2	p1	p5	p2	p4	p5	p3	p2	p5	p2

p2*	p2*	p2*	p2*	P5	p5	p5*	p5*	P3	P3	P3	P3*
	p3	p3	P3	p3*	P2	P2	P2	p2*	P2*	P5	P5
			P1	p1	P1*	p4	p4	p4	p4	P4*	p2
		hit					hit		hit		



LRU

- The least recently used page replacement algorithm keeps track page uses over a short period of time.
- The LRU algorithm can be implemented by associating a counter with every page that is in main memory.

time	1	2	3	4	5	6	7	8	9	10	11	12																																
page	P2	p3	p2	p1	p5	p2	p4	p5	p3	p2	p5	p2																																
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OPT

- The optimal policy selects that page for replacement for which the time to the next reference is longest.
- This algorithm result is fewest number of page faults.

time	1	2	3	4	5	6	7	8	9	10	11	12																																				
page	P2	p3	p2	p1	p5	p2	p4	p5	p3	p2	p5	p2																																				
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ADVANTAGES OF VIRTUAL MEMORY

- Allows processes whose aggregate memory requirement is greater than the amount of physical memory, as infrequently used pages can reside on the disk.
- 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.



DISADVANTAGES OF VIRTUAL MEMORY

- Applications run slower if the system is using virtual memory.
- It Takes more time to switch between applications.
- Less hard drive space for your use.
- It reduces system stability.



QUESTIONS:-

- 1. What is virtual memory ?**
- 2. What is the advantage and disadvantages of virtual memory?**
- 3. What is the need and importance of virtual memory?**
- 4. What is the page replacement algorithm list all the Algorithms?**
- 5. Which page replacement algorithm is best and how?**

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jagatpur P.G. College Varanasi Affiliated to Mahatma

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Thank
You

