AMRITSAR GROUP OF COLLEGES
(AUTONOMOUS COLLEGE)
DEPARTMENT OF COMPUTER SCIENCE & ENGINEERING

B. Tech. (CSE-I) 4th SEM
OPERATING SYSTEM
ACCS - 16402
Assignment-2

Total Marks: 24

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Section-A

(6*2=12)

Q1.

a) Differentiate between physical and logical address.[CO4]

Ans:

	Logical Address	Physical Address
(a)	It is an address generated by CPU during program execution.	It refers to a physical location in the memory unit.
(b)	User programs deals with the logical address directly.	The user program never sees the physical address.
(c)	Vertually generated by CPU.	Exits is within the MMU.
(d)	It is variable.	It is Constant.
(e)	Used to access physical address.	Not directly accessed.

b) Define the term Locality of reference and Page fault? [CO4]

Ans: Locality of reference refers to a phenomenon in which a Computer program tends to access same set of memory locations for a particular time period. In order words in refers to tendency of Computer program to access instruction whose address are near one another. Pagefault dominates like an error if program trues to access piece of memory but which is not existed into physical memory means main memory then page fault will be occurred. The fault specifies the as that it must trace all data into virtual memory management and after the mores it from secondary memory like hard disk to primary memory of system.

c) Differentiate between internal and external fragmentation with example?[CO4]

Ans:

Internal	External
(a) unused memory blocks are allocated.	Available memory blocks are non-contiguous.
(b) memory is divided into fixed size blocks.	memory is divided into varying size blocks.
(c) occurs when allocated space is bigger than needed space.	occurs at the removal of a process from memory.
(d) occurs when paging is used.	occur when segmentation is used.

d) What is thrashing? Describe the cause of thrashing. How thrashing can be prevented.[CO4]

Ans: Thrashing is a state in which the cpu performs productive work less and swapping more. The overall memory access time may increase since the higher level memory is only as fast as the next longer level in the memory hierarchy. It is caused by under allocation of the minimum number of pages required by process. forcing it to continuously page fault. It can be prevented by allocating each process as many frames as it requires during own.

e) Explain the concept of Demand Paging?[CO4]

Ans: In Computer operation system, demand paging is a method of virtual memory management. The o/s copies a disc page into physical memory only if attempts is made to access it and that page is not already in memory. It follows that a process begins execution with name of its page in physical memory and many page faults will occur limit most of a process is increasing set of pages are located in physical memory.

f) What do you mean by virtual memory?[CO4]

Ans: Virtual memory is a storage allocation scheme in which secondary memory can be addressed as through it wire parts of the main memory. The address a program may use to reference memory are distinguished from the addressed the memory system uses to identity physical storage sides and program generated addresses are translated automatically to the corresponding machine addresses. The size of virtual storage is limited by the addressing scheme of the Computer system and the amount of secondary memory is available not by the actual number of the main storage location.

Section-B

(3*4=12)

Q2. If the contents of reference using is: 7, 0, 1, 2, 0, 3, 0, 4, 2, 3, 0, 3 and three frames are available in the memory then how FIFO and LRU page replacement algorithm works.[CO4]

Ans: FIFO:- Oldest page in memory needs to replaced the performance of the fifo is not always good because it may happens that the page which is the oldest is freguency be as

page requested	7	0	1	2	0	3	0	4	2	3	0	3
Frame 1	7	7	7	2	2	2	2	4	4	4	0	0
Frame 2		0	0	0	0	3	3	3	2	2	2	2
frame 3			1	1	1	1	0	0	0	3	3	3
frame 4	f	f	f	f		f	f	f	f	f	f	

Total page fault = 10

LRU:- This algorithm virorg on the principale of last recently used. It replaces the page that has not been referred by the CPU for the longest time.

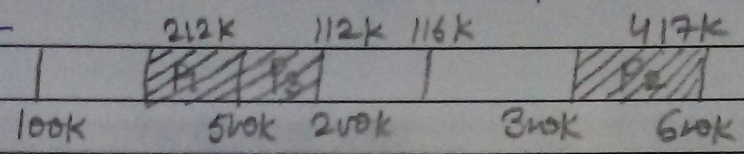
page requests	7	0	1	2	0	3	0	4	2	3	0	3
Frame 1	7	7	7	2	2	2	2	4	4	4	0	0
Frame 2		0	0	0	0	0	0	0	0	3	3	3
Frame 3			1	1	1	3	3	3	2	2	2	2
Page fault	f	f	f	f		f		f	f	f	f	

Total page fault=9

Q3. Give memory partition of 100K,500K,200K,300K and 600K(in order).How would each of the first fit, best fit and worst fit algorithm place process of 212k,417k,112k,and 426k(in order)? Which algorithm makes the most efficient use of memory?[CO4]

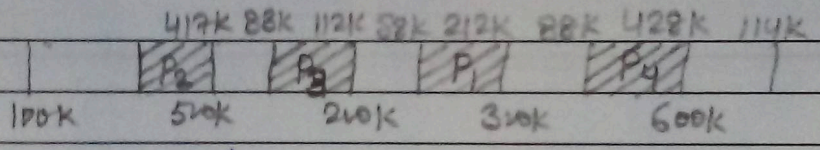
Ans: $P_1 = 212K$, $P_2 = 417K$, $P_3 = 112K$, $P_4 = 426K$

(a) First fit:-



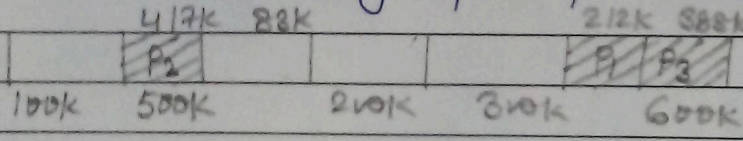
$P_4 = 426K$ must lost.

(b) Best fit:-



Take smallest which is sufficient for process.

(c) worst fit:- Take big space for a process.



$P_4 = 42K$ must wait

In this example, best-fit turns out be the best.

Q4. Explain Segmentation with example.[CO4]

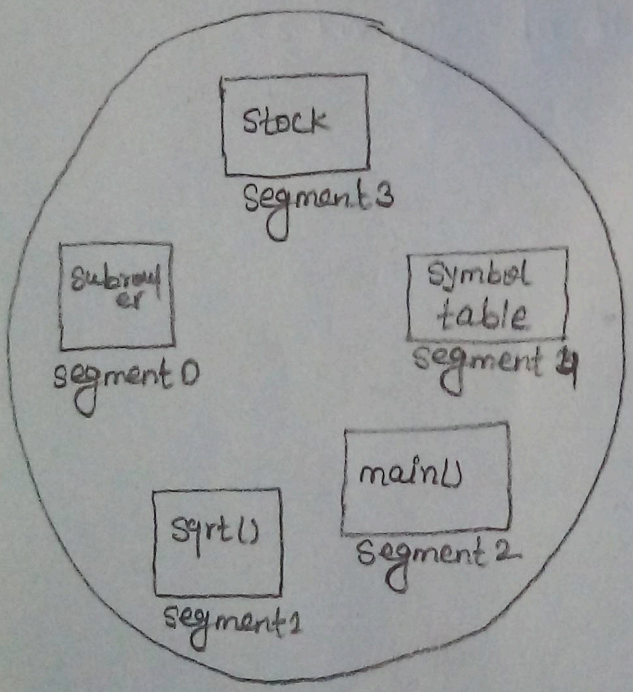
Ans: A process is divided into segments. The chunks that a program is divided into which are not necessary all of the same sizes are called segments segmentation gives user's view of the process which paging does not give. Here the user's view is mapping to physical memory.

There are types of segmentation:-

(a) virtual memory segmentation:- Each process is divided into a number of segments, not all of which are resident at any one point in time.

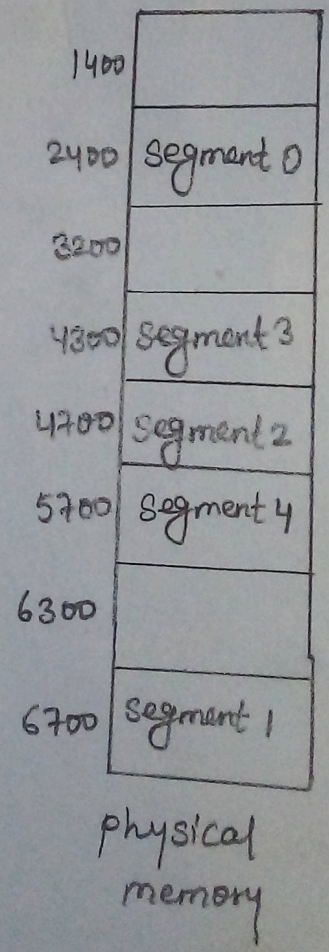
(b) Simple segmentation :- Each process is divided into a number of segments all of which are loaded into memory at run time, though not necessarily contiguously.

Example :- Consider that a user program has been divided into four segments and they are numbered from segment 0 to segment 4, as you can see them in the logical address space. You also have segment table which has entries for these segment with their base address in physical memory and their limit.



	limit	base
0	1000	1400
1	400	6300
2	400	4300
3	1100	3200
4	1000	4700

Segment table



physical memory

Now Suppose the CPU Calls for segment number 2 which is 400 bytes long and it resides at 4300 memory location. The CPU wants to refers 53rd byte of segment 2. So, here the input we get from cpu is segment number 2 and 53 is offset.

Now the offset is in between 0 and limit of the segment 2 i.e 400 so, the condition got verified and the offset is ~~Condition~~ being added to the base address of the segment 2 in physical memory. In Case you try to access the 453rd byte of segment 2 then it would result in a trap of the operating system as offset value 453 is greater than the limit of segment 2.