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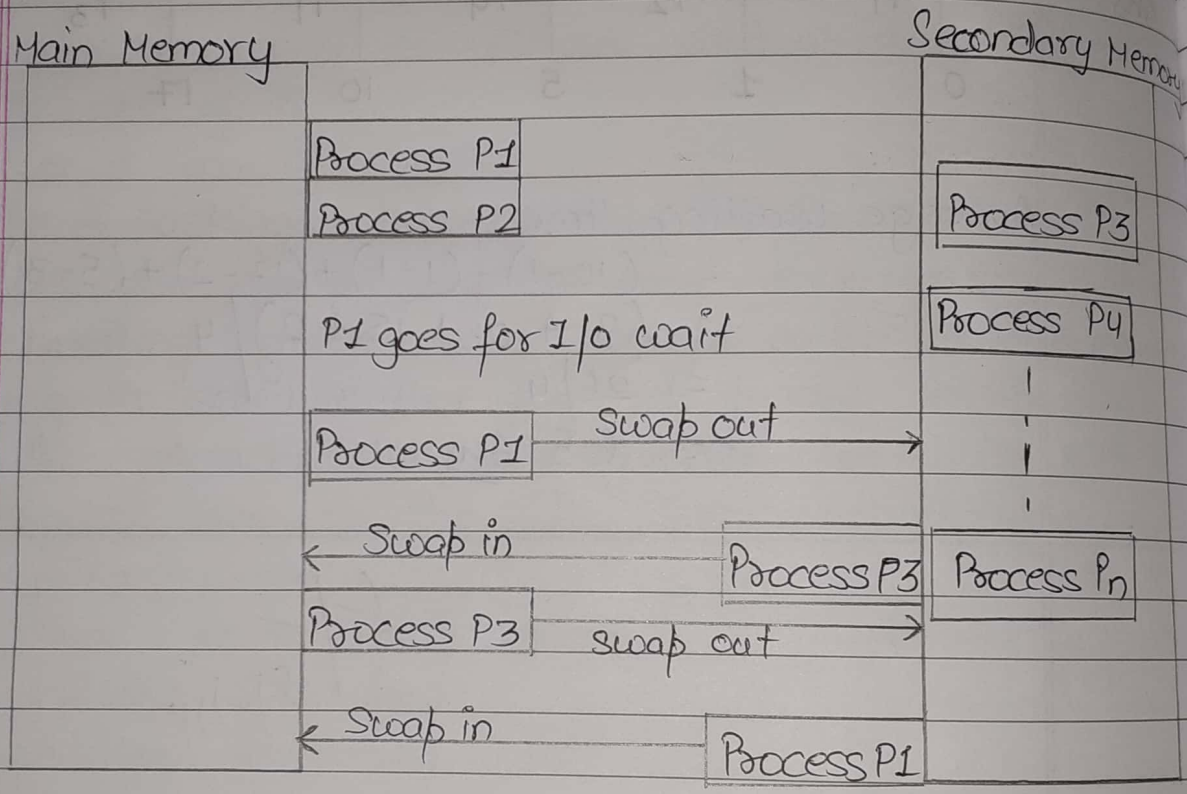
Assignment-3

Q.1 What is swapping? Explain with relevant diagram.

Ans. It is a mechanism in which a process can be swapped temporarily out of main memory to secondary memory. Later again swaps back to main memory.



Q.2 Explain the types of memory fragmentation.

Ans. There are two types of memory fragmentation:-

1. External Fragmentation :- It happens when a dynamic memory allocation algorithm allocates some memory and a small piece is left over that cannot be effectively used. If too much external fragmentation occurs, the amount of usable memory

is drastically reduced.

2. Internal Fragmentation: It is the space wasted inside of allocated memory blocks because of restriction on the allowed sizes of allocated books. Allocated memory may be slightly larger than requested memory, the size difference is memory internal to a partition but not being used.

Q.3 What is the use of virtual memory? Explain with example.

Ans. A computer can address more memory than the amount physically installed on the system. This extra memory is called virtual memory and it is a section of hard disk that's set up to emulate the computer's RAM.

There are two uses:

* It allows us to extend the use of physical memory by using disk.
* It allows us to have memory protection, because each virtual address is translated to a physical address.

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Q.4 Explain any three page replacement algorithms.

Ans. 1. First-in - first out :- The simplest page-replacement algorithm is a FIFO algorithm. It is a low overhead algorithm that requires little book keeping on the part of operating system. When a page needs to be replaced the page at the front of queue is selected. While FIFO is cheap and intuitive it performs poorly in pratical application.

2. Least Recently Used : The Least Recently used algorithm keeps track of page usage over a short period of time., while LRU works on the idea that pages that have been most heavily used in the past few instructions are most likely to be used heavily in the next few instruction too.

3. Optimal Page Replacement :- An optimal page replacement algorithm has the lowest page-fault rate of all algorithm exists, and has been called OPT or MIN. It replace the page that will not be used for the longest period of time. Use the time when a page is to be used.

Q.5 What is demand Paging? Explain.

Ans. A demand paging system is quite similar to a paging system with swapping where processes reside in secondary memory and pages are loaded only on demand, not in advance. When a context switch occurs, the operating system does not copy any of the old program's pages

out to the disk or any of the new program's pages into the main-memory Instead it just begins executing the new program after loading the first page and fetches that programs pages as they are referenced.

While executing a program, if the program references a page which is not available in the main-memory because it was swapped out a little ago, the processor treats this invalid memory reference as a page fault and transfers control from the program to the operating system to demand the page back into the memory.