Lab Three

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1 Problem One

Q: Explain the difference between internal and external fragmentation.

Fragmentation is what happens to free spaces in memory as processes are being loaded and/or removed. If left unchecked, this free space will bloat up, leaving chunks of memory unusable. There are two types of fragmentation to consider in memory: internal and external.

1.1 Internal

Internal fragmentation is when space is wasted within a requested block. This occurs because the loaded process requires more or less space than the current memory block. In order to qualify as internal, the memory blocks have to be of a fixed size. A solution to be to implement a Best-Fit algorithm, or rather to use variable-sized chunks of memory.

1.2 External

External fragmentation is when space is wasted in between already used memory. This occurs because the loaded process has been removed from the memory. In order to qualify as external, the memory blocks are of varying, non-contiguous sizes. A solution is to use a Coalescing algorithm, or rather to join the patches together.

2 Problem Two

Q: Given give (5) memory partitions of 100KB, 500KB, 200KB, 300KB, and 600KB (in that order), how would optimal, first-fit, best-fit, and worst-fit algorithms place processes of 212KB, 417KB, 112KB, and 426KB (in that order)?

The Best-Fit algorithm is the most optimal algorithm to use, as it was the only algorithm to meet the given memory blocks.

2.1 First-Fit

212KB => 500KB == 288KB partition

417KB => 600KB == 183KB partition

112KB => 288KB == 176KB partition

426KB => no available partition

2.2 Best-Fit

212KB => 300KB == 88KB partition

417KB => 500KB == 83KB partition

112KB => 200KB == 88KB partition

426KB => 600KB == 174KB partition

2.3 Worst-Fit

212KB => 600KB == 388KB partition

417KB => 500KB == 83KB partition

112KB => 388KB == 276KB partition

426KB => no available partition