Lab 8 Contiguous Memory Allocation Course: Operating Systems

Exercise 1

Given six memory partitions of 300 KB, 600 KB, 350 KB, 200 KB, 750 KB, and 125 KB (in order), how would the first-fit, best-fit, and worst-fit algorithms place processes of size 115 KB, 500 KB, 358 KB, 200 KB, and 375 KB (in order)? Rank the algorithms in terms of how efficiently they use memory

First fit	Best fit	Worst fit
115(KB) to 300(KB) partition	115(KB) to 125(KB) partition	115(KB) to 750(KB) partition
500(KB) to 600(KB) partition	500(KB) to 600(KB) partition	500(KB) to 635(KB) partition
358(KB) to 750(KB) partition	358(KB) to 750(KB) partition	358(KB) to 600(KB) partition
200(KB) to 350(KB) partition	200(KB) to 200(KB) partition	200(KB) to 350(KB) partition
375(KB) to 392(KB) partition	375(KB) to 392(KB) partition	375(KB) must wait

Exercise 2

Student write a short report that compares the advantages as well as disadvantages of the allocation algorithms, namely First-Fit, Best-Fit, Worst-Fit.

Algorithm	Advantage	Disadvantage
First fit	Fastest algorithm because it searches as little as possible.	The remaining unused memory areas left after allocation become waste if it is too smaller. Thus request for larger memory requirement cannot be accomplished.
Best fit	Memory utilization is much better than first fit as it searches the smallest free partition first available.	It is slower and may even tend to fill up memory with tiny useless holes.
Worst fit	Reduces the rate of production of small gaps.	If a process requiring larger memory arrives at a later stage then it cannot be accommodated as the largest hole is already split and occupied.

References

[1] Wikipedia. http://en.wikipedia.org, last access: 15/04/2019.

[2] Silberschatz, Galvin, and Gagne, Operating System Concepts.

[3] Tanenbaum, Modern Operating Systems.