King Saud University

College of Applied Studies and Community Service
Bachelor of Applied Computing
(GC310): Applied Operating Systems
Tutorial # 8

1. Given memory partitions of 100K, 500K, 200K, 300K, and 600K (in order), how would each of the First-fit, Best-fit, and Worst-fit algorithms place processes of 212K, 417K, 112K, and 426K (in order)? Which algorithm makes the most efficient use of memory?

   Solution:

   First-Fit:
   212K is put in 500K partition.
   417K is put in 600K partition.
   112K is put in 288K partition (new partition 288K = 500K - 212K).
   426K must wait.

   Best-Fit:
   212K is put in 300K partition.
   417K is put in 500K partition.
   112K is put in 200K partition.
   426K is put in 600K partition.

   Worst-Fit:
   212K is put in 600K partition.
   417K is put in 500K partition.
   112K is put in 388K partition.
   426K must wait.

   In this example, Best-Fit turns out to be the best.

2. Consider a paging system with the page table stored in memory. If a memory reference takes 200 nanoseconds, how long does a paged memory reference take?

   Solution:
   A paged memory reference would take **400** nanoseconds; 200 nanoseconds to access the page table and 200 nanoseconds to access the word in memory.

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3. Assume a program P1 is loaded into memory with the following SMT:

Segment	Limit	Base
0	4000	1000
1	8000	2000

Translate the address (1,50) to an absolute address.
Solution:

<#segment, Offset> ➡ <1, 50>
offset is less than limit ➡ 50 < 8000 (OK)
<base, offset> ➡ <2000 , 50> ➡ 2000 + 50 = 2050.