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8.11 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:

six memory partitions turned into : 300->185 600->100 350->150 200 750->392->17 125

Best-fit:

six memory partitions turned into : 300 600->100 350 200->10 750->392->17 125->10

Worst-fit:

six memory partitions turned into : 300 600->242 350->150 200 750->635->135 125

Best Fit is the most efficient use of the memory, leaving the smallest remainder in the least amount of partitions, next comes first fit for doing the next best job, worst fit comes last because it is least efficient but also could not complete the task and ran out of space to put the last one.

Therefore, the rank will be best-fit > first-fit > worst-fit.

8.25 Consider a paging system with the page table stored in memory.

a. If a memory reference takes 50 nanoseconds, how long does a paged memory reference take?

b. If we add TLBs, and 75 percent of all page-table references are found in the TLBs, what is the effective memory reference time? (Assume that finding a page-table entry in the TLBs takes 2 nanoseconds, if the entry is present.)

- 2*50=100ns
- EAT=(1+e)*a+(2+e)*(1-a)
  =(50+2)*0.8+(100+2)*0.2
  =62ns

8.26 Why are segmentation and paging sometimes combined into one scheme?

In a combined paging/segmentation system a user address space is broken up into a number of segments at the discretion of the programmer. Each segment is in

turn broken up into a number of fixed-size pages which are equal in length to a main memory frame. If a segment is less than a page in length, the segment occupies just one page. From the programmer`s point of view, a logical address still consists of a segment number and a segment offset. From the system`s point of view, the segment offset is viewed as a page number and page offset for a page within the specified segment.

8.28 Consider the following segment table:
Segment Base Length
0 219 600
1 2300 14
2 90 100
3 1327 580
4 1952 96
What are the physical addresses for the following logical addresses?
a. 0,430
b. 1,10
c. 2,500
d. 3,400
e. 4,112

a.219+430=649
b.2300+10=2310
c. Error, because 500>100
d.1327+400=1727
e. Error, because 112>96